ICoME 2020

International Conference for Media in Education 2020

CONFERENCE PROGRAM

AND PROCEEDINGS

Diversity education in

ICT advanced society

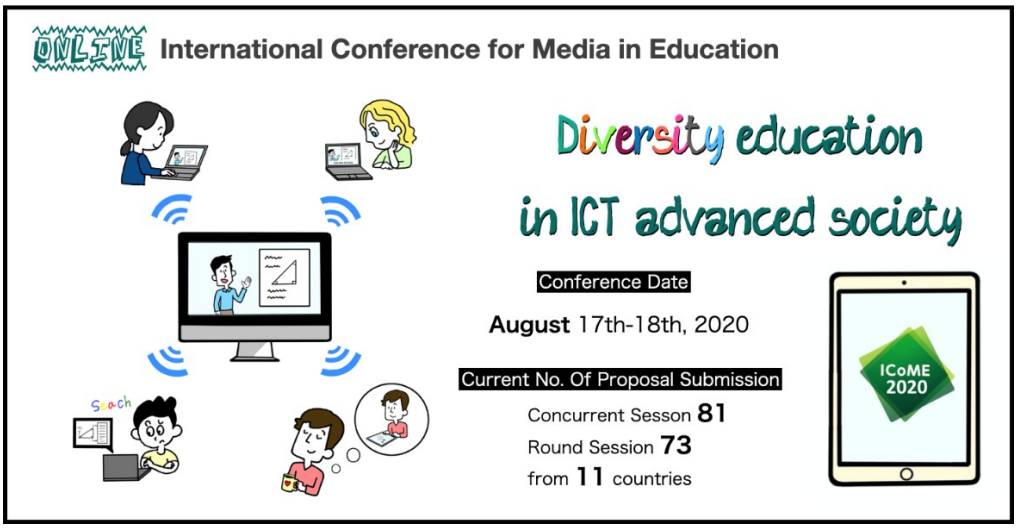
International Conference for Media in Education 2020

CONFERENCE PROGRAM
AND
PROCEEDINGS

Theme
Diversity education in ICT advanced society

August, 17th & 18th, 2020

Oline Cnference
(KOBE・ JAPAN)



International Conference for Media in Education 2020

Table of Contents

Invitation for ICoME 2020

You are cordially invited to ICoME 2020 (International Conference for Media in Education). ICoME 2020 occurs as the 18th joint conference supported by the four prominent academic societies specialized in Media use in Education: Japan Association for Educational Media Study (JAEMS), the Korean Association for Educational Information and Media (KAEIM), China Association for Educational Technology (CAET) and Teaching, Colleges and Community (TCC).

During ICoME 2020, we will explore the ways to strengthen international connections under the theme of "Diversity Education in ICT advanced society "

Diversity in Education has appeared as an increasingly pressing topic since ICT was adopted at schools. The classrooms face the world through the Internet, and students can now readily connect to people throughout the world and thus interact more closely with people from different cultures.

In addition, ICT allows students to become designers, creators, journalists, community developers, programmers, and data analysts. They are thus able to extend their diverse talents utilizing a variety of ICT tools. We, as educators, can facilitate students' realization of their talents through different kinds of ICT.

Amidst these developments, it is essential for students to have an understanding and appreciation for other cultures. To make the classroom more culturally diverse, we need to cultivate awareness about other learners, peers and community members. Through collective efforts, we need to enable greater interaction with members of other cultures.

Therefore, we would like to invite researchers and educators who study the diversity of ICT enhanced education from around the world. We especially look forward to having a deep discussion and creating more awareness about the possibility of ICT to enhance diversity in Education in Japan!

Makiko, KISHI Ph.D.

The Chair of ICoME 2020 Executive Committee

Associate Professor, Meiji University, JAPAN

Committee members of ICoME 2020

ICOME 2020 EXECUTIVE COMMITTEE & CHAIRS

Chair: Makiko KISHI, PhD. Meiji Univerisity, JAPAN
Co-Chair: Mihoko CHIBA, PhD. Konan University, JAPAN
Co-Chair: Makoto KAGETO, PhD. Nihon Fukushi University, JAPAN
Co-Chair: Ryota YAMAMOTO, PhD. The University of Tokyo, JAPAN

JAPAN

Masayuki KUDO, PhD. Fuji Women's University, JAPAN
Wakio OYANAGI, PhD. Kansai University, JAPAN
Xiaohong ZHANG, PhD. Kumamoto University, JAPAN
Tomomi TAKABAYASHI, PhD. Cyber University, JAPAN

KOREA

Hoseung BYUN, PhD. Chungbuk National University, KOREA
Ji-Yeon LEE, PhD. Inha University, KOREA
Jeeheon RYU, PhD. Chonnam National University, KOREA

CHINA

Kedong LI, PhD. South China Normal University, CHINA
Jianhua ZHAO, PhD. Southern University of Science and Technology, CHINA
Yuqi DONG, PhD. Shanghai Normal University, CHINA
Xiaoqing GU, PhD. East China Normal University, CHINA
Ronghuai HUANG, PhD. Beijing Normal University, CHINA
Pengze WU, PhD. South China Normal University, CHINA
Shaoqing Guo, PhD. North-west Normal University, CHINA
Shiqing Hu, PhD. Shenzhen University, CHINA
Junjie SHANG, PhD. Peking University, CHINA
Shaochun ZHONG, PhD. North-east Normal University, CHINA
Di Wu, PhD. Centeral China Normal University, CHINA
Geping Liu, PhD. South-west University, CHINA
Shanyun KUANG, PhD. South China Normal University, CHINA
Xiaoli ZHENG, PhD. Wenzhou University, CHINA
Dan LU, PhD. Northeast Normal University, CHINA
Jue WANG, Ph.D. Northeast Normal University, CHINA
Yinghui SHI, PhD. Central China Normal University, CHINA

UNITED STATES OF AMERICA

Bert KIMURA, PhD. The University of Hawaii at Manoa, USA, Kansai University, Japan
Curtis HO, PhD. The University of Hawaii at Manoa, USA
Kitty HINO, Ms. The University of Hawaii at Manoa, USA

ICoME 2020 Local Organizing Committee

Chair: Mihoko CHIBA, PhD. Konan University, JAPAN
Kohei NISHIKAWA, Mr., Konan University, JAPAN
Yukio KONISHI, Mr., Konan University, JAPAN
Shari YAMAMOTO, Ms., Konan University, JAPAN

Technical Contribution

Kuroki Ayumi, Ms., Visual translator, JAPAN

Conference Program

17 August 2020

10:00-10:20	Opening Ceremony
10:30-11:30	Keynote 1: Panel Discussion **"Experiential Learning Supports Diversity Education"** **Coordinator** Makoto KAGETO, *Affiliated Professor, Nihon Fukushi University, JAPAN* **Panelists** Kenichi KUBOTA, *Professor emeritus, Kansai University, JAPAN* Go ASAKAWA, *International Coordinator, Ritsumeikan Junior & Senior High School, JAPAN* Makoto KAGETO, *Affiliated Professor, Nihon Fukushi University, JAPAN*
11:30-13:00	Lunch Break & Tutorial for Roundtable presenter
13:00-13:15	Opening Talk of Roundtable Session
13:30-15:00	Roundtable Session 1
15:00-15:15	Break
15:15-16:45	Roundtable Session 2
16:45-17:15	Break
17:15-17:45	Closing Talk of Roundtable Session
17:45-19:00	Online Student Night out (NOMIKAI Session)

18 August 2020

10:00-11:00	Casual Talk Café
11:30-13:00	Concurrent Session 1
13:00-14:00	Lunch Break
14:00-15:30	Concurrent Session 2
15:30-16:30	Keynote 2 **The search for new normals in education from 2020: Focus on language for specific purposes** Judy NOGUCHI, *Professor emerita, Kobe Gakuin University, JAPAN*
16:30-17:00	Break
17:00-18:00	Closing Ceremony (Representative Talk, Young Scholar Awards, Information on ICoME2021, Closing Remarks)

***Program time and date indicate by Japan Standard Time (GMT+9:00)**

Information About Session

● For Roundtable Session Presenters

The round table session will be held on August 17th.
There are two segments of the session; from 13:30 to 15:00; and from 15:15 to 16:45.

The round table session has a couple of objectives.
First, we attempt to deepen our discussion of a topic concerning contemporary issues on education and media use through research.
Second, we attempt to support young researchers by facilitating international connections and wider horizons for their future career and prospective lives.

Therefore, we planned extra activities; such as the Closing Talk of Roundtable Session and the Online Student Night out for those who participate in the round table session.

Round table session will use a Zoom meeting.

Each meeting room will have 5 presenters and two faculty members who evaluate your presentation for students' award. Also please expect the audience may join.

Each session has a student facilitator who keeps time and coordinates the session.
When you join in the round table session and make presentations, follow the instructions. Next.

1. Join in the Zoom meeting room 15 minutes before according to the URL you received via email.
2. Please inform the student facilitator in the Zoom meeting room where you are making a presentation to know that you are present.
3. Add ★ to your name and presentation No. when your name appears on the Zoomscreen.
4. Try out the "screen share" function before your presentation.
5. Start your presentation according to the schedule. We'd appreciate your keeping the time frame: 11 minutes for the presentation and 3 minutes for the discussion.

The discussion will be launched with a call from the participant.
1. Use the "raise hand" icon
2. Say "I have a question!"
3. Use the online chat function.

A student facilitator will support the participants by introducing each questionnaire.
Please remain in the meeting room until all the participants have finished their presentation.

This session has been planned to allow for interaction across the participants, so please refrain from leaving the session early.

After the session, feel free to leave.
The participants of Round Table Session participants will be evaluated by a couple of fine researchers.

ICoME will award the student scholar award for those who receives high evaluations.
We will announce the award winners in the closing ceremony. Please do not miss the award!

Closing Talk of Roundtable Session will be explained.

The participants of the Roundtable Session will reflect on the session together.
Please consider joining the closing talk where the evaluators will provide the participants with feedback.

Online Students' Night will be explained.
By using a Breakout room, this event will be provided to deepen students' interaction in the Online Student Night out. Please consider asking questions below.

-What kind of presentation did you make?
-Any impression or afterwards comments?
-How can you proceed with your research or future career?

When you would like to take a group picture, please make sure to have an agreement from all on the screen.

- **For Concurrent Session Presenters**

The concurrent session will be held on August, 18th.
There are two segments of the session; from 11:30 to 13:00; and from 14:00 to 15:30.

The concurrent session will employ a Zoom meeting for the presentation session.
Each meeting room will have 4 presenters and a chair. Also please expect the audience may join.

Please follow the instruction below to join in the concurrent session.

1. Join in a Zoom meeting room 15 minutes before according to the URL you received via email.
2. Please let the chairperson in the Zoom meeting room know that you are a presenter.
3. Add ★ to your name and presentation No. when your name appears on the Zoom screen.
4. Try the "screen share" function before your presentation.
5. Start your presentation according to the schedule. We'd appreciate your keeping the time frame of presenting for 14 minutes followed by a 5-minute discussion.

Regarding the discussion after the presentation:

1. Use the "raise hand" icon
2. Say "I have a question!"
3. Use the online chat function.

Please remain in the meeting room until all participants have finished their presentations.
Please refrain from recording the session.
Permission is required for using screen-capture and taking pictures.
Enjoy your presentation and discussion!

Keynote

Keynote 1, 10:30-11:30, August 17, 2020

Panel Discussion "Experiential Learning Supports Diversity Education"

Coordinator: Makoto KAGETO, *Affiliate Professor, Nihon Fukushi University, JAPAN*

ICoME2020 has welcomed three practitioners who have discussion on experiential learning supports diversity education in the fields of international cooperation and advanced technology. In the panel discussion, they will share their practices and the ideas on the following three questions and future directions.

(1) New communication methods.
What kind of new skills should students acquire when the figures of information transmission change? How to utilize online or face-to-face meetings.
(2) Comparison of "School Knowledge", learned only at school, and "Active Knowledge", gained through experiential learning.
(3) How can we stimulate collaboration to activity facing diversity of participants?

Kenichi KUBOTA

Professor emeritus,
Kansai University, JAPAN

Inter-University Collaborative Project at Teacher Training College in Cambodia

I would like to introduce a unique international project in which students from three universities collaboratively participated for improving instructional methods at the teacher training college in Cambodia. The unique features are the followings:

(1) Diversity ・・・The universities are in three big cities in Japan. Students have different majors and ages.
(2) Experiential ・・・The project is action research oriented. The students experience more than one cycle on intervention.
(3) Communication ・・・Hybrid communication by face-to-face and the Internet is necessarily to achieve their mission.
(4) Social emotional skills ・・・The students develop social emotional skills by working in the project to overcome hindrances. Agency is the key to nurture the skills.

Go ASAKAWA

International Coordinator,
Ritsumeikan Junior & Senior High School,
JAPAN

To establish a new style of an international program by "RitsMentor Online Discussion Event 2020"

Through" RitMentor Online Discussion Event 2020", we would like to open up this closed world to establish a new relationship with students(people) living in different countries and regions with whom to share common ideas through a fun and exciting event including five meetings on Sundays.
I would like to introduce a new approach through ICT to open up this closed situation under coronavirus pandemics and to restart a new type of international students' exchange program, by which we can not only improve their English and ICT skills more than that of a regular meeting in person, but could expand their potential and possibilities by inspiring their imagination and inquiring minds, to find another possibilities for the future.

Makoto KAGETO

Affiliate Professor,
Nihon Fukushi University,
JAPAN

EDU-Port Project "ICT skill seminar" via advanced Technology

EDU-Port Japan is the Education Ministry Project, public-private initiative to disseminate Japanese-style education overseas. From 2016 we have been involved in this project.
This year, our proposal was approved as the pilot project in Cambodia. Its keywords are "ICT education with effective media utilization".
In 2020. we are devoted to "Development of "Home-learning Contents" in Cambodia with two universities implementing SDGs-4 and Learner-Centered ICT education"
Our consortium is focusing on enhancing English learning methods at the Phnom Penh Teacher Education College and Siem Reap Teacher Training College. We show how ICT can be used for group-work and interactions through hands-on training sessions. We also expect Japanese schools will join this project under the banner of SDGs4 by sharing some online contents.

Keynote 2, 15:30-16:30, August 18, 2020

The search for new normals in education from 2020: Focus on language for specific purposes

Judy NOGUCHI

Professor emerita, Kobe Gakuin University, JAPAN

Abstract

The year 2020 will mark a significant change in human history in the aftermath of the global COVID-19 pandemic—this might be a blessing in disguise. In Japan, as we try to control the virus and resume classroom schooling with cautions about keeping social distance, we realize that we can never return to what we had long thought of as "normals" After a three-month shutdown of schools and universities in Japan and the shift to online classes for the new academic year (which should have begun in April), we need to think about what kind of education we should offer to students. What will be the "new normals"? It is time for a paradigm shift from a 20th century education system that basically tried to fit students into a set learning program rather than tailor the program to the student. One key to helping us address the diverse needs of diverse students is technology. As an example of how this might be done, I will focus on English language education for science and technology professionals in a foreign language environment. Specific language and communication skills are crucial for enabling participation in the knowledge construction of a professional global discourse community. Suggestions will be offered as to how this could be done.

Representative Talk Speakers (Closing Remarks)

Representative Talk, 17:00-18:00, August 18, 2020

Wakio OYANAGI

Professor, Kansai University, JAPAN

President of Japan Association for Educational Media Study (JAEMS)

Wooyong Eom

Professor, Keimyung University, SOUTH KOREA

President of Korean Association for Educational Information and Media (KAEIM)

Jianhua ZHAO

Professor, Southern University of Science and Technology, CHINA

Representative of China Association for Educational Technology (CAET)

Bert KIMURA

Professor emerita, University of Hawai'café at Manoa, USA

Co-Chair of Teaching, Colleges and Community (TCC)

Casual Café Talk

Casual Talk Café, 10:00-11:00, August 18, 2020

In the morning before the serious sessions, why don't we have a little break with your global peers while having tea or coffee?

We extend a special invitation to all participants to join in the informal talk session scheduled on the morning of the 18th (10:00 – 11:00). We would like to set up a time slot for casual talks so that we can frankly discuss our recent experiences related to COVID 19. This virtual café can be a great place for getting to know someone with the same view or difficulty and /or an opportunity for those who are looking for international connections.

The café has four separate rooms with a coordinator according to your interests. You may choose one, or you can jump around to join in the other discussions. All you need is to bring your beverages and a topic to share with your peers!

Four Rooms

Room1: The present educational conditions under the Coronavirus pandemic in your countries
Coordinator: Mr. Gibran Garcia, Ph.D. (Mexico)

Room2: New research seeds for in/post coronavirus pandemic
Coordinator: Ms. Shari Yamamoto (Japan/USA)

Room3: Business opportunities in and after the Coronavirus pandemic
Coordinator: Ms. Jenni Fajardo (Philippines) & Ms. Lan Yan (China)

Room4: Changes in the situation for research publications amidst the Coronavirus pandemic
Coordinator: Mr. Ken Morimoto (Japan)

Program

10:00 – 10:20 Introduction and Getting to Know Each Other

10:20 – 10:50 Tea and Informal talk

10:50 – 11:00 Summary and Exchanging Contacts

Roundtable Session 1

Room A（13:30-15:00, August 17, 2020）

Room B（13:30-15:00, August 17, 2020）

Room C（13:30-15:00, August 17, 2020）

1-C1 How Enhancing Learning Motivation Using ICT as a Learning Environment in International Collaborative Learning

Yuki Omachi (Meisei University), Yoshiki Otsuka (Meisei University), Maiko Kawano (Meisei University), Takayuki Konno (Meisei University)

1-C2 Factors that may Promote First-Year-Student Motivation in Online Classes in Higher Education

Kyoko Matsuki (Meiji University), Jun Jiwun (Meiji University), Shunsuke Yamada (Meiji University), Yuho Terabe (Meiji University)

1-C3 The Implementation Status of Active Learning of Group Activities in the Comprehensive Practical Activity Curriculum of Primary Schools in China

Lingfei Yin (Kansai University), Mayumi Kubota (Kansai University)

1-C4 Emotion recognition by measuring EEG and pupil diameter in virtual reality simulation

Eunbyul Yang (Chonnam National University),Sungmin Lim (Chonnam National University), Museok Jeong (Chonnam National University), Jeeheon Ryu (Chonnam National University)

1-C5 Student apartment design by students - A fieldwork to create a space to connect with the local community

Maho Suzuki (Chukyo University), Yoshiro Miyata (Chukyo University)

Room D（13:30-15:00, August 17, 2020）

Room E（13:30-15:00, August 17, 2020）

Roundtable Session 2

Room A（15:15-16:45, August 17, 2020）

Room B（15:15-16:45, August 17, 2020）

Room C（15:15-16:45, August 17, 2020）

Room D（15:15-16:45, August 17, 2020）

Room E（15:15-16:45, August 17, 2020）

Concurrent Session 1

Room A（11:30-13:00, August 18, 2020）

Chair：Akihito Kito (Yokohama National University)

1-A1 Audio-Visual material in teaching a power generation using piezoelectric element

----------p.174

Akihito Kito (Yokohama National University), Liang Shuang (Yokohama National University)

1-A2 The Possibility of Fostering Metacognitive Ability in Online Math Classes using the Balloon method

----------p.182

Haruhisa Komoto (Kansai University), Haruo Kurokami (Kansai University)

1-A3 Development and Evaluation of 360-degree VR Training System for English Public Speaking: Cross-analysis with Participants' Proficiency

----------p.187

Miharu Fuyuno (Kyushu University)

1-A4 Zoom In (but Fasten Your Seatbelt)

----------p.195

Tamara Fudge (Purdue University Global), Lynne Williams(Purdue University Global)

Room B（11:30-13:00, August 18, 2020）

Chair：Mayumi Kubota (Kansai University)

1-B1 The Features of Online Transformative Negotiation—From the perspective of mediation—

----------p.202

Mayumi Kubota (Kansai University), Yuka Suzuki(J.F. Oberlin University)

1-B2 Two by Two on One

----------p.209

Katherine Watson (Orange Coast College)

1-B3 Asian International Projects focusing on SDGs4

----------p.214

Chia Ling Hsieh (Nihon Fukushi University), Makoto Kageto (Nihon Fukushi University), Shinichi Sato (Nihon Fukushi University)

1-B4 Immersive video materials for standardized English-speaking tests: Development and ongoing application

----------p.220

Laura Maria Blanco Cortes (Kyushu University), Miharu Fuyuno (Kyushu University), Mikako Tomotari (Kyushu University)

Room C（11:30-13:00, August 18, 2020）

Chair：Bert Y. Kimura (TCC Hawaii / University of Hawaii)

1-C1 TCC: 25 Years of an Evolving Online Conference

----------p.228

Bert Y. Kimura (TCC Hawaii / University of Hawaii), Curtis P. Ho (University of Hawaii), Kitty Hino (University of Hawaii)

1-C2 Discussions of Diversity and Understanding: A Faculty Training Pilot on Online Microaggression

----------p.235

Kae Novak (University of Colorado - Denver)

1-C3 Online teaching practice of public elective courses based on "inquiry learning and open access"

----------p.240

Huawei Cui (Zhongkai University of Agriculture and Engineering), Miao Aimin (Zhongkai University of Agriculture and Engineering)

1-C4 Mathematical Problem-solving Strategies Related to Self-regulated Learning

----------p.244

Kayoko Hashimoto (Tokyo University of Science), Yuki Watanabe (Tokyo University of Science)

Room D（11:30-13:00, August 18, 2020）

Chair：Yayoi Anzai (International Christian University)

1-D1 An Empirical Study on Collaborative Online International Learning

Yayoi Anzai (International Christian University)

1-D2 The Use of Tweet-Format Narrative Reflections During a Service-Learning Trip to Appalachia

Allison C. Munn (Francis Marion University), Tracy P. George (Francis Marion University), Tiffany A. Phillips (Francis Marion University), J. Marty Hucks (Francis Marion University)

1-D3 Integrated assessment of citizen self-awareness and critical thinking in Japan and Costa Rica through Comic analysis

Aaron Eli Mena Araya (University of Tsukuba Graduate School)

1-D4 The Usefulness of Workshops Based on the Web in School Scenes

Takeshi Goto (Oji Elementary School)

Room E（11:30-13:00, August 18, 2020）

Chair：Shinichi Sato (Nihon Fukushi University)

1-E1 Diversity Learning with 360-degree Videos Recorded During Students' Fieldwork

----------p.278

Shinichi Sato (Nihon Fukushi University), Makoto Kageto (Nihon Fukushi University)

1-E2 Development and evaluation of online educational materials for understanding advertisements: Learning persuasive techniques and dietary knowledge

----------p.282

Kanae Suzuki(University of Tsukuba), Aya Momose (NTT DOCOMO),Teiichi Nishioka (University of Tsukuba)

1-E3 Exploring the relationship between visually salient feedback and gaming behavior in educational games

----------p.290

Yeaeun Gong (Seoul National University), Gahgene Gweon (Seoul National University)

1-E4 The Pattern of Facebook Use among Libyan Students and Teachers in Turkey: A Case Study

----------p.296

Marwa Ezzidin Grain (International Christian University)

Room F（11:30-13:00, August 18, 2020）

Chair：Peter Roux (Saga University)

1-F1 Developing cultural intelligence (CQ) in blended environments: Understanding and assessing experiential learning methods

----------p.301

Peter Roux (Saga University), Ryuchi Matsuba (Kumamoto University), Katsuaki Suzuki (Kumamoto University), Yoshiko Goda (Kumamoto University)

1-F2 Moving from Crisis Distance Education to Optimal Online Learning

----------p.309

Michael P. Menchaca (University of Hawaii at Manoa), Amber S. Makaiau(University of Hawaii at Manoa), Erin Nakano (Hawaii Department of Education), Ngan-Ha Ta (‘Iolani School)

1-F3 Capacity-Building for Technology Literacy Skills: Inquiry on University Students' Characteristics, Behaviors, and Perceptions

----------p.317

Danilo M Baylen (University of West Georgia), Merle Lorca-Junsay (Central Philippine University)

1-F4 The factors causing the degree of changes of students in Australia and Japan

----------p.325

Akinori Kimura (Kansai University), Kurokami Haruo (Kansai University), Yoshino Keiko (Belair Primary school), Dominic Graham (Belair Primary school)

Room G（11:30-13:00, August 18, 2020）

Chair：Xiaoli Zheng (Wenzhou University)

1-G1 A Meta-analysis Review of Effects of Critical Reading Teaching on Students' Writing Argument Skills in China

----------p.330

Xiaoli Zheng (Wenzhou University), Jue Yu (Chonnam National University), Yipin Huang (Chonnam National University), Yating Zheng (Wenzhou University)

1-G2 Investigation of Structures of Television Documentary Representation Based on Qualitative Analysis of Descriptions by Program Direct

----------p.338

Asuka Murai (Tohoku University), Tatsuya Horita (Tohoku University)

1-G3 ePortfolios for Study Abroad Assessment and Improvement: Monitoring Students' Use of a Target Skill While Abroad

----------p.346

Miki Cutting (Ritsumeikan Asia Pacific University/Kumamoto University), Yoshiko Goda (Kumamoto University), Katsuaki Suzuki (Kumamoto University)

1-G4 Improving Students' participation and collaboration with adjusting CLOUD education platform during the real-time interactive class

----------p.354

Minchul Shin (Jinwol Elementary School), Wooyong Eom (Keimyung University)

Concurrent Session 2

Room A（14:00-15:30, August 18, 2020）

Chair：Erin Noxon (Sagano High School)

2-A1 Global Interaction: Becoming a "good global citizen" through blended learning in an English communication class

----------p.360

Erin Noxon (Sagano High School)

2-A2 Creating Religious English Online Content Using the Successive Approximation Model (SAM)

----------p.368

Younglong Kim (Oklahoma State University), Yoonhee Shin (Dankook University)

2-A3 Practices Implemented at a Japanese University to Sustain Educational Opportunities for First-Year Students

----------p.376

Shari Yamamoto (Konan University)

2-A4 Support Design for Massive Open Online Course (MOOC) Learners -Voices from the Freshman MOOC Learners-

----------p.384

Yuki Ichimura (Kumamoto University), Hiroshi Nakano (Kumamoto University), Katsuaki Suzuki (Kumamoto University)

Room B（14:00-15:30, August 18, 2020）

Chair：Hoseung Byun (Chungbuk National University),
Ryota Yamamoto (The University of Tokyo)

2-B1 The Changing Concepts of Media, and Prospects for Education

----------p.391

Hoseung Byun (Chungbuk National University), Seunghyeon Choi (Chungbuk National University)

2-B2 Changes of Students' Beliefs about Cooperation in Synchronous Online Mathematics Classes Incorporating Cooperative Learning

----------p.397

Tomohiko Shima (Kanagawa Gakuen Girls' Junior and Senior High School), Yuki Watanabe (Tokyo University of Science), Minoru Ito (Tokyo University of Science)

2-B3 Analyzing Factors That Promote Students' Understanding about Active Learning in Teacher Education

----------p.405

Yao Ke (Kansai University), Kenichi Kubota (Kansai University)

2-B4 Investigating good teaching and learning experiences in the perspectives of university students through social network analysis

----------p.413

Suna Oh (Gwangju University), Heoncheol Yun (Chonnam National University), Jeonghee Ryu (Gwangju University)

2-B5 An Alternative Form of Informal Learning Using ICT

----------p.421

Ryota Yamamoto (The University of Tokyo)

Room C（14:00-15:30, August 18, 2020）

Chair：Yoshiro Miyata (Chukyo University)

2-C1 Bringing personal meanings to education - Designing education during and after COVID-19

Yoshiro Miyata (Chukyo University), Masaki Fukushima (Chukyo University), Maho Suzuki (Chukyo University)

2-C2 Golden Opportunity, Silver Lining or Dystopian Determinism: A Discussion of the Impact of the COVID-19 Pandemics Pivot to Online and the Opinions of Practicing Educators

Mark Curcher (Tampere University of Applied Sciences)

2-C3 Education Responses to COVID-19: A Comparison of Four Countries

Jan Maia Duggan (International Christian University), Jennifer Christine (International Christian University), Clasara Fajardo (International Christian University), Roberto Jr. Bacani Figueroa (International Christian University), Eiman Yassin (International Christian University), Insung Jung (International Christian University)

2-C4 Combating the Covid-19 Hate and Racism Speech on Social Media

Reima Al-Jarf (King Saud University)

Room D（14:00-15:30, August 18, 2020）

Chair：Yinghui Shi (Central China Normal University)

2-D1 Systematic Review of Digital Note-taking in Higher Education

----------p.460

Yinghui Shi (Central China Normal University), Qiuyu Pu (Central China Normal University)

2-D2 A University Course to Cultivate Students' Inquiry-mind when Writing News Stories

----------p.468

Xiaohong Zhang (Kumamoto University), Kaoru Matsubayashi (The Graduate School of Information and Communication)

2-D3 Stepping Backward to Move Forward: Developing Media Instructions with the Backward Design Framework

----------p.472

Sarinporn Chaivisit (Oklahoma State University)

2-D4 Designing Online Learning Experiences from Scratch: Challenges, Lessons, and Opportunities

----------p.479

Danilo M Baylen (University of West Georgia)

Room E（14:00-15:30, August 18, 2020）

Chair：Wakio Oyanagi (Kansai University)

Room F（14:00-15:30, August 18, 2020）

Chair：Tomomi Takabayashi (Cyber University)

2-F1 What can be more adaptive in ICT advanced higher education with neuro-diversity? From the perspective of educational communication

Tomomi Takabayashi (Cyber University)

2-F2 Study on the improvement of reading effect of children with reading difficulties in digital environment

Yuanhao Fang (South China Normal University), Liu Huan (South China Normal University)

2-F3 Practice and effect of video media workshop by student exchange

Atsushi Nagao (Kagawa University), Takayuki Kunieda, Naka Gotoda , Ryo Kanda, Rihito Yaegashi (Kagawa University)

2-F4 Exploratory Formative Research on Instructional Design Principles for Learners with Special Needs in Physical Computing Education

Jai Hong Lee(Seoul National University), Juhyeon Park(Seoul National University), Yoojin Bae(Seoul National University), Cheolil Lim(Seoul National University)

Room G（14:00-15:30, August 18, 2020）

Chair：Ken Kiyohara (Hawaii Tokai International College)

2-G1 An Examination of Human Resources Professionals' perceptions about the intergration of e-learning in the workplace

Ken Kiyohara (Hawaii Tokai International College)

2-G2 A Study on Development of An Instructional Design and Technology Class and Instructional Designs of Pre-Service Teacher-Training Students

Kento Nakamura (Tokyo University of Science), Tadashi Misono (Shimane University), Yuki Watanabe (Tokyo University of Science)

2-G3 The Pathways to the Profession of Faculty Mentors through Collaborative Experiences in Higher Education

Yukari Kato (Tokyo Metropolitan University)

2-G4 Development of a model for teaching support system based on a program for the use of nudge and gamification to improve career proficiency

Han Hee Lee (Pukyung National University),
Gyun Heo (Pukyung National University)

PROCEEDINGS

KEYNOTE

Panel Discussion:
Experiential Learning Supports Diversity Education

Coordinator
Makoto KAGETO, *Affiliate Professor, Nihon Fukushi University, JAPAN*
Panelists
Kenichi KUBOTA, *Professor emeritus, Kansai University, JAPAN*
Go ASAKAWA, *International Coordinator, Ritsumeikan Junior & Senior High School, JAPAN*
Makoto KAGETO, *Affiliate Professor, Nihon Fukushi University, JAPAN*

INTRODUCTION

ICoME2020 has welcomed three practitioners who have discussion on ***experiential learning supports diversity education*** in the fields of international cooperation and advanced technology. In the panel discussion, they will share their practices and the ideas on the following three questions and future directions.

(1) New communication methods.
What kind of new skills should students acquire when the figures of information transmission change? How to utilize online or face-to-face meetings.
(2) Comparison of "School Knowledge", learned only at school, and "Active Knowledge", gained through experiential learning.
(3) How can we stimulate collaboration to activity facing diversity of participants?

Inter-University Collaborative Project at Teacher Training College in Cambodia
Kenichi Kubota (Professor emeritus, Kansai University)

I would like to introduce a unique international project in which students from three universities collaboratively participated for improving instructional methods at the teacher training college in Cambodia. The unique features are the followings:
(1) Diversity: The universities are in three big cities in Japan. Students have different majors and ages.
(2) Experiential: The project is action research oriented. The students experience more than one cycle on intervention.
(3) Communication: Hybrid communication by face-to-face and the Internet is necessarily to achieve their mission.
(4) Social emotional skills: The students develop social emotional skills by working in the project to overcome hindrances. Agency is the key to nurture the skills.

To establish a new style of an international program by “RitsMentor Online Discussion Event 2020”
Go Asakawa (International Coordinator, Ritsumeikan Junior & Senior High School)

Through“ RitMentor Online Discussion Event 2020”, we would like to open up this closed world to establish a new relationship with students(people) living in different countries and regions with whom to share common ideas through a fun and exciting event including five meetings on Sundays.
I would like to introduce a new approach through ICT to open up this closed situation under coronavirus pandemics and to restart a new type of international students’ exchange program, by which we can not only improve their English and ICT skills more than that of a regular meeting in person, but could expand their potential and possibilities by inspiring their imagination and inquiring

minds, to find another possibilities for the future.

EDU-Port Project “ICT skill seminar” via advanced Technology
Makoto Kageto (Affiliate Professor, Nihon Fukushi University)

EDU-Port Japan is the Education Ministry Project, public-private initiative to disseminate Japanese-style education overseas. From 2016 we have been involved in this project.
This year, our proposal was approved as the pilot project in Cambodia. Its keywords are “ICT education with effective media utilization”.
In 2020. we are devoted to “Development of “Home-learning Contents" in Cambodia with two universities implementing SDGs-4 and Learner-Centered ICT education”
Our consortium is focusing on enhancing English learning methods at the Phnom Penh Teacher Education College and Siem Reap Teacher Training College. We show how ICT can be used for group-work and interactions through hands-on training sessions. We also expect Japanese schools will join this project under the banner of SDGs4 by sharing some online contents.

The search for new normals in education from 2020: Focus on language for specific purposes

Judy Noguchi
jnoguchi@gc.kobegakuin.ac.jp
Professor Emerita
Kobe Gakuin University
Kobe, Japan

The year 2020 will mark a significant change in human history in the aftermath of the global COVID-19 pandemic—this might be a blessing in disguise. In Japan, as we try to control the virus and resume classroom schooling with cautions about keeping social distance, we realize that we can never return to what we had long thought of as "normal." After a three-month shutdown of schools and universities in Japan and the shift to online classes for the new academic year (which should have begun in April), we need to think about what kind of education we should offer to students. What will be the "new normals"? It is time for a paradigm shift from a 20th century education system that basically tried to fit students into a set learning program rather than tailor the program to the student. One key to helping us address the diverse needs of diverse students is technology. As an example of how this might be done, I will focus on English language education for science and technology professionals in a foreign language environment. Specific language and communication skills are crucial for enabling participation in the knowledge construction of a professional global discourse community. Suggestions will be offered as to how this could be done.

Key words: Pandemic, New Normals, Foreign Language Teaching, English for Specific Purposes (ESP)

INTRODUCTION

Human history is a chronicle of disasters both natural and human-made which have led to drastic changes in their aftermath. Natural disasters include earthquakes, tsunamis, hurricanes and typhoons as well as disease pandemics. Human-made disasters include wars and political strife leading to much suffering and the loss of lives.

Today, we are in the midst of the COVID-19 pandemic, probably the first to be so well-documented and reported as well as the first to spread so quickly around the world. While it is frightening to be living during such uncertain times in which so much is not known about this new coronavirus with superspreading power, it is also a time to start thinking ahead to what can be done after we have been able to find ways to diminish its effects by using medicines or vaccines. This is what humans have done after countless pandemics in the past. The key to success is not to try to simply return to the previous status quo but to utilize this as an

opportunity to build something better.

SEARCHING FOR NEW NORMALS IN FOREIGN LANGUAGE EDUCATION

Here let us focus on a specific area of education that will become even more important in the future: the teaching of foreign languages.

Teaching is about the transfer of knowledge. There are basically two types of knowledge: propositional knowledge and procedural knowledge (Fantl, 2017 in the *Stanford Encyclopedia of Philosophy*). In the case of foreign language teaching, propositional knowledge can be thought of as "knowledge about language," or the vocabulary, grammar rules, and the pronunciation and prosody of the language to be learned. On the other hand, the procedural knowledge, or "knowledge about how to use the language," would require an awareness of linguistic relativity, discourse communities and genres.

Both types of knowledge are important, but to acquire the fluency necessary for meaningful communication requires an understanding of the elements involved in procedural knowledge (Alter & Oppenheimer, 2009). The first, linguistic relativity, is discussed by Wolff & Holmes (2010, p. 253) who state that "language can augment certain types of thinking" and that "there is growing support for the view that language has a profound effect on thought." This means that it is not only the words and phrases of a language that need to be considered but more importantly, the choice and ordering of information to be presented.

The two other concepts of "discourse community" and "genre," important for the acquisition of procedural knowledge, have been informed by research in ESP, or English for specific purposes. A discourse community, as defined by Swales (1990), is a group of people who are connected by their discourse and do not have to be in physical proximity. For effective and efficient communication, they use a variety of genres, or types of text. A genre text has three essential features: the action it is to accomplish, the substance or information that it carries, and the form or the textual structure itself (Miller, 1984:151). In the case of foreign language teaching, knowing the language patterns used to realize the genre framework offers the key to success.

REALIZING NEW NORMALS IN A FOREIGN LANGUAGE CLASSROOM

While propositional knowledge can be acquired via "book" learning with exercises and quizzes, grasping procedural knowledge requires experiencing it via activities. One type of pre-class activity in preparation for a flipped classroom is proposed by Tokuhama-Espinosa (2020). For an extension course, she tries to accommodate the diversity of student levels and learning styles by preparing "Bundles," or mini-libraries of Web resources to be accessed and worked with prior to the students attending the lectures. This allows students to select materials appropriate to their level of knowledge to prepare them for the class lectures and tasks.

An activity very useful for students who are not language majors but are studying in the sciences is one in which they learn how to mediate science news. "Mediation" is described in CEFR (2018) as making "communication possible between persons who are unable, for whatever reason, to communicate with each other directly." This usually applies to translation or interpretation between languages but can also include the explanation of difficult material. The importance of mediation is clear today as governments around the world, struggling to deal with the COVID-19 pandemic, are also having to cope with a 'pandemic of misinformation' (Pazzanese, 2020). Those in the sciences must understand the necessity of disseminating evidence-based information to the general public and possess the skills with which to do this effectively and efficiently.

To show students how to develop such skills and to also learn how to deal with new genres as the need arises, they begin by choosing a science news item from a podcast site where the latest scientific research is mediated for the general public, i.e., cutting-edge research is explained in a manner which makes it interesting and relevant to a non-specialist audience. The students listen very carefully to emulate the prosody patterns of the announcer and then are guided through a genre analysis of the text. The next step is to use what they have learned about the genre to explain their own research or other material from their area of expertise to make it understandable to the general public. This activity helps students develop an awareness of how to use a genre approach to achieve effective communication.

Finally, a course focusing on helping students develop procedural knowledge of the language they are

learning should not rely on tests and exams for evaluation. Instead, student assessment can be done using e-portfolios of the work that they have done during the course, including feedback on the tasks and student reflection notes. E-portfolios not only document student progress during the course but also serve as a useful reference for students when they encounter new genres as they progress in their careers. The e-portfolio can serve as the student's own personalized "how to learn" guide.

CONCLUSION

The global pandemic confronting us today is likely to lead to new normals in human society. Adapting to change after crises is not new in human history but the situation today is the first time that technology is playing such an important role in how humans communicate with each other. The focus of this presentation has been on the teaching of foreign languages, with English as an example. The need to move from too strong a focus on propositional knowledge to the acquisition of procedural knowledge is emphasized. This can be aided by taking a systematic view of language acquisition for diverse contexts, being aware of linguistic relativity, and taking advantage of ESP (LSP) concepts and tools for language analysis. Specific examples of activities and tasks to aid student development were presented to illustrate how technology can support diversity and individualized learning.

REFERENCES

Alter, A. L. & Oppenheimer, D. M. (2009). Uniting the tribes of fluency to form a metacognitive nation. *Personality and Social Psychology Review*, Vol. 13 No. 3, August 2009 219-235. DOI: 10.1177/1088868309341564

Council of Europe. (2018). Common European Framework of Reference for Languages: Learning, Teaching, Assessment. Companion Volume with New Descriptors. https://rm.coe.int/cefr-companion-volume-with-new-descriptors-2018/1680787989

Fantl, J. (2017). "Knowledge How", *The Stanford Encyclopedia of Philosophy* (Fall 2017 Edition), Edward N. Zalta (ed.). https://plato.stanford.edu/archives/fall2017/entries/knowledge-how/

Miller, C. R. (1984). Genre as social action. *Quarterly Journal of Speech*, 70, 151-167.

Pazzanese, C. (2020) Battling the 'pandemic of misinformation.' *The Harvard Gazette.* May 8, 2020. https://news.harvard.edu/gazette/story/2020/05/social-media-used-to-spread-create-covid-19-falsehoods/

Swales, J. (1990). *Genre analysis: English in academic and research settings.* Cambridge, UK: Cambridge University Press.

Wolff, P. & Holmes, K. J. (2011). Linguistic relativity. *Wiley Interdisciplinary Reviews*: *Cognitive Science* 2(3):253 – 265. DOI: 10.1002/wcs.104

Research on the teaching effect based on the network course platform during the COVID-19 Epidemic

Naikun Huang
hnkun0902@qq.com
Master
South China Normal University
Guangzhou, China

Key words: Teaching effect, Network course platform, Online teaching

ABSTRACT

In recent years, the rapid development of the Internet and Information Technology has provided the hardware basis for the spread of network information, changed the mode of information transmission, and improved the efficiency of information transmission. Network Platform Teaching is an important part of network information dissemination, from the initial on-demand teaching platform to the interactive teaching platform and now to the social teaching platform, it is developing at an overwhelming speed in our country. Network Platform Teaching has become one of the most popular teaching methods for teachers and students because of its openness and interactivity in teaching methods, the globality and diversity of educational resources and the flexibility and diversity of teaching forms. It gives students who are limited by the time, place and environment in which they study an opportunity to access a higher quality personalized education. Using the network teaching platform to carry on the teaching has already become an important teaching practice of higher education.

During the epidemic period, the Ministry of Education issued the *Guiding opinions of the Office of the Leading Group of the Ministry of Education's work of responding to the epidemic of pneumonia caused by new coronavirus infection on how to do a good job in the organization and management of online teaching in ordinary colleges and universities during the epidemic prevention and control period* .The document calls for government-led, university-oriented and social participation to jointly implement and ensure the online teaching of the university during the epidemic prevention and control period. Universities should make full use of online MOOC and high-quality online course teaching resources at the provincial and university levels, driven by MOOC platform and experimental resource platform services, relying on various online course platforms at various levels and online learning spaces on campus, etc. , we will actively carry out online teaching activities such as online classes and online learning to ensure the progress and quality of teaching during the epidemic prevention and control period.

In this context, on-line teaching based on the network teaching platform has not only as an auxiliary means of *blended learning* in the classroom, but also as classroom normalization. So, by contrast, what is

the teaching effect of network teaching normalization? Through exploration and practice, this study intends to explore the effect of the normalization of online teaching, and to analyze the existing problems and explore solutions.

REFERENCES

Yu Shengquan, He Kekang. (2001). The structure and function of network teaching platform. *China Educational Technology*, 8:60-63.

He Kekang. (2004). New development of educational technology theory from blending learning(I). *China Educational Technology*, 3:7-8.

Xie Xiaolin, Yu Shengquan, Cheng Gang. (2007). New development of network teaching platform. *Research on Open Education*, 10:12-25.

Liu Jinzhi, Liu Jin. (2010). Research on teaching mode based on network teaching platform. *Electric Power Education in China*, 1:107-109.

Opinions of the Ministry of education on the construction of national excellent open Courses. (2012). http://www.moe.gov.cn/publicfiles/business/htmlfiles/moe/s6342/201111/xxgk_126346.html, 08-20.

Huang Dequn. (2013). Research on the application of blended learning mode based on network teaching platform in Colleges and Universities. *Journal of Distance Education*, 3:64.

The Ministry of education novel coronavirus infection leading group office should guide the organization and management of online teaching in ordinary colleges and universities during the epidemic prevention and control period. (2020). http://www.moe.gov.cn/srcsite/A08/s7056/202002/t20200205_418138.html, 02-04.

Ministry of education novel coronavirus infection leading group office of the work of the epidemic prevention and control information support education and teaching work during the notice. (2020). http://www.moe.gov.cn/srcsite/A16/s3342/202002/t20200214_421005.html, 02-06.

The social factors that encourage career development utilizing double roots of third generation Japanese Peruvians

Hiroki Utsunomiya
k884649@kansai-u.ac.jp
Graduate student
Kansai University
Takatsuki city, Japan

Mayumi Kubota
mkubota@kansai-u.ac.jp
Professor
Kansai University
Takatsuki city, Japan

Key words: Japanese ethnicity, TEM, Social capital, career development

ABSTRACT

The purpose of this study is to reveal the social factors to simulate career development utilizing double roots of third generation Japanese Peruvians and its effect.

In recent years, there were many Japanese ethnicity who perform peripheral career development in Japan. (Report of Foreign Collection living city meeting 2017) Kohadu (2016) stated that parent-child relationship and parent career affect to child career development. In addition, Aiba et al. (2008) stated that they clarify some of social factors for Japanese Peruvians to change peripheral career development. However, Aiba et al. just mentioned to break away peripheral career development in the direction of assimilating with Japan, but not mention in the direction of making use of their roots. Moreover, the effect of the social factors for career development is unknown.

Thus, in this study focus on career development utilizing double roots to organize interview date, create Trajectory Equifinality Model (TEM), and analyze it. The survey perspective is third generation Japanese Peruvian woman who is 50 years old. She proactively uses her roots to disseminate information as a member of NGO.

The author analyzed the effect for the career development using TEM and capital perspective. Since, TEM is good at clarifying the factors that promote certain actions from the existing data such as the concept of career formation and time in the field of psychological research. The author used the following method to create TEM. First, the author got 90 minutes of interview three times. Second, dividing the voice data to cords in accordance with the Kinoshita Jiro (KJ) method. Third, defining the action for Equifinality Point (EFP) to be analyzed. Fourth, lining up the code to represent the process toward the targeted action. Fifth selecting a branch point or an essential passage point comparing the narrative and the code. Finally,

considering the effect of Social Direction (SD) / Social Guide (SG) based on the combination of the code placed and add them. The author clarified the factors that promoted the career formation by utilizing the double roots by analyzing the obtained TEM.

As the result, it was found that social capital of Japanese involvement affects career development in the direction of making use of their roots. In addition, it could be said that the relationship with Japanese people who have a context related to Japanese ethnicity's own ability, belief and values to select a career is a sufficient condition for career formation utilizing double roots. It would stimulate them to discover an environment in which they can make use of the ability and value that can be effectively used as Japanese ethnicity. Moreover, that environment makes them actively develop their careers.

REFERENCES

Aiba, N., & Higuchi, N. (2008). How Japanese-American Workers Can Escape from Non-Regular Working-A Study on the Conditions and Consequences-. *Zenrosai Association Public Research Series* 14

Foreign Collection living city meeting (2017). *Report of Foreign Collection living city meeting 2017*

Kohadu, H.,(2018) The Relevance of Academic Background and Professional Experiences of Peruvian Second Generation : The Case of Sixteen Peruvian with Different Academic Background . *Asian and African Studies*., 58: 37-58

Consideration of the Learning Environments for Japanese Learning Surrounding International Students: From the Perspectives of the Inside and Outside of School

Mao Koketsu
nw180219@n-fukushi.ac.jp
Undergraduate student
Nihon Fukushi University
Aichi, Japan

Mahiro Usui
nw180102@n-kushi.ac.jp
Undergraduate student
Nihon Fukushi University
Aichi, Japan

Sopha Kanlaya
nw180334@n-kushi.ac.jp
Undergraduate student
Nihon Fukushi University
Aichi, Japan

Key words: Learning Environment, International Student, Off-campus Learning

ABSTRACT

In 2008, the Ministry of Education, Culture, Sports, Science and Technology implemented the 300,000 international student plan (increase the number of international students to 300,000 by 2020) to promote global human resource development and globalization in Japan (MEXT, 2008). Now that goal has been achieved, it is now possible to see them at many educational institutions in Japan. Japanese students have the opportunity to learn about different cultures and international students have the opportunity to learn living Japanese. However, there is a lot of debate about the quality of Japanese language education for international students, and there are also questions about the support and learning environment for them. Based on these findings, this study focuses on Nihon Fukushi University, with the aim of considering the learning environment of international students studying at university, from the perspectives of both inside and outside university and making suggestions for a better learning environment.

In order to achieve this purpose, we conducted a prior research survey on the literature in order to obtain knowledge about support for foreign students and Japanese language education that have been conducted so far. We also conducted an interview survey. As for the previous research we chose Nagoya University of Foreign Studies to compare with Nihon Fukushi University because it has had a system for

accepting international students. The subjects of the interview were Japanese language teachers, students aiming to become Japanese language teachers, ordinary and international students.

As a result, all Japanese language teachers can acquire the qualifications after the training course (420 hours)., This meansi they can become teachers without gaining experience. Thus, poor explanation and quality will emerge. On the other hand, students aiming to become Japanese teachers do not have a high quality and ordinary students answered there has been little interaction between Japanese students and international students. Results were obtained from their respective positions. In terms of the off-campus learning environment, international students study alone. Therefore, it is difficult for them to set goals and maintain motivation. On the other hand, they can learn Japanese expressions in life by watching favorite Japanese comics, TV, and dramas. It's a fun way to learn Japanese expressions that are used daily.

Therefore, the conclusion is that outside the university, Japanese language teachers need a place for training at public institutions so that they can get retrained. In addition, it may help motivate university students in the Japanese teacher training course to give opportunities for educational exchanges with international students from an early stage of the course. Many students aiming to become Japanese language teachers do not know how to properly support foreign students, hence it is necessary to improve the quality of supporters for international students. Increasing opportunities for ordinary students to interact with international students would be helpful to let them think more about international students. For example, holding an event at university will help foreign and Japanese students talk. What is more, foreign students can study at their free time because there are no restrictions on place and time. In other words, enriching the off-campus learning environment leads to campus learning one.

REFERENCES

MEXT (2008). *The main points of "the plan to accept 300,000 international students" ("Ryugakusei 30 mannin keikaku" kosshi* in Japanese)
https://www.mext.go.jp/a_menu/koutou/ryugaku/1420758.htm (accessed 2020-06-11)

The Potential of 360-degree Videos in Pre-Learning of Experiential Activities

Akihiro Onishi
nw170103@n-fukushi.ac.jp
Undergraduate student
Nihon Fukushi University
Aichi, Japan

Key words: 360-degree Video, VR, Imagination, Motivation

ABSTRACT

When we watch a 360-degree video with a virtual reality (VR) goggle, we can feel as if we were really there and can have a realistic experience (e.g., Bailenson, 2018). Virtual reality head-mounted display has more good points than ordinary desktop displays in terms of quality, the field of view, viewpoint tracking, stereoscopic effect, display size, and realism (e.g., Kiyokawa, 2017). You can get more specific imagination than being explained by letters and words, and watching usual videos. Students can get the feeling of having experienced something by 360-degree videos even if they have never experienced it. I thought that this would improve human imagination and motivation for activities similar to video content, improve work efficiency, and enable efficient support through 360-degree video. In this study, I consider the effects that will be caused for students' imagination and behavior by viewing 360-degree videos. I participated in the International Symposium on Education (ISE) at Chonnam National University in 2018. This is an educational conference held jointly by Nihon Fukushi University, Japan, Wenzhou University, China, and Chonnam National University, Korea.

I aimed to support second-year students at Nihon Fukushi University, who planned to attend the ISE held at Chonnam National University in 2019 for the first time. I provided them with 360-degree videos of the symposium in 2018. The video was edited with a combination of caption and video by using authoring software on the computer. After the students watched the video, I directly interviewed with the students on the video content to investigate the changes about their impression and understanding of ISE.

The result shows that the students had more actual image of the ISE after watching the 360-degree video. When I asked them about necessary preparations to join the ISE, they answered more than before. I think that there was a big difference in the impression of the symposium before and after watching the video. Another characteristic opinion was that they could grasp the size of the venue and the distance between the presenter and the audience. This opinion tells one of the possibilities of 360 video experience using VR goggles. From these opinions, it was found that providing 360-degree videos can support the pre-learning of experiential activities. There was also an opinion that they wanted to experience from another

viewpoint. Based on these results, I will consider better ways to capture and use 360-degree video in the future.

REFERENCES

Bailenson, J. (2018) *Experience on Demand: What Virtual Reality Is, how it Works, and what it Can Do*. WW Norton & Company.

Kiyokawa, K. (2017) Merits of Scientific Visualization Using Virtual Reality Technology ― Through a Variety of Studies ―, *Journal of the Visualization Society of Japan, 37*(146), 2-7.

Research of Precision Teaching Model based on Intelligent Assessment

He Min
1351256537@qq.com
Master student
South China Normal University
Guangzhou, China

Key words: Precision Teaching, Intelligent Assessment, Model

ABSTRACT

INTRODUCTION

At present, China's artificial intelligence technology has been developing rapidly, and a series of intelligent recognition technologies based on text, voice, image and video have been developed, which can be applied to the assessment process of education and teaching. Precision teaching was proposed by Ogden Lindsley in the 1960s based on Skinner's behavioral learning theory. Professor Zhu zhiting introduced it into China in 2016 to combine it with information technology. After that, it has attracted extensive attention of scholars, but there are many difficulties in practice. Based on this, this study attempts to combine intelligent assessment with precision teaching, and carry out the research of precision teaching mode based on intelligent evaluation.

RESEARCH DESIGN&METHODS

The research firstly uses the literature research method to systematically analyze domestic and foreign research literature related to intelligent assessment and precision teaching, grasp the relevant theories of precision teaching, systematically sort out the platform of intelligent assessment, and gain a deeper understanding of the application status of intelligent assessment and precision teaching. Then analyze the application models and application cases proposed by current precision teaching, and summarize the implementation experience.

Secondly, combined with the requirements of precise teaching and the functional characteristics of the intelligent assessment platform, under the guidance of activity theory, the teachers, students, learning content, intelligent assessment platform, intelligent assessment implementation rules, division of labor of intelligent assessment and other elements that constitute the accurate teaching system are deeply analyzed. Find the internal relationship between the elements, analyze the driving force to promote the development of the system. And analyze the precision teaching process based on intelligent assessment based on the ADDIE model of instructional design, and construct various types of precise teaching operation processes based on intelligent assessment, including based on intelligent assessment of the precise target positioning mode, the precise push resource mode, the precise support service mode and the precise intervention mode, etc.

Then, a middle school in Pingshan District of Shenzhen will be selected as the experimental object. Combined with the intelligent assessment software — Oral English 100 Score app, we apply the model to practice. And a precise teaching model based on intelligent assessment was constructed in practice by using design-based research method. Also, the effectiveness of the model was verified by experimental research.

Finally, we put forward suggestions for the development of intelligent assessment technology and its application in precision teaching.

RESULTS

The research finish the construction of precision teaching model based on intelligent assessment, and applies it to practical teaching, and verifies the effectiveness of the model through experimental research.

REFERENCES

Zhu Zhiting, & Peng Hongchao. (2016). Efficient Knowledge Teaching Supported by Information Technology: Stimulating the Vitality of Precision Instruction. *China Educational Technology*, (01):18-25.

A Students' Attitude Survey of Active Learning Classroom for Science

Shota YANO
1720521@ed.tus.ac.com
Master Course Student
Department of Mathematics and Science Education, Graduate School of Science, Tokyo University of Science Tokyo University of Science
Tokyo, Japan

Yuki WATANABE
Wat@rs.tus.ac.jp
Associate professor
Department of Mathematics and Science Education, Graduate School of Science, Tokyo University of Science Tokyo University of Science
Tokyo, Japan

Key words: Active Learning, Learning Space, Science Education, Science Classroom

ABSTRACT

Enhancement of the quality of lessons for independent, interactive, and deep learning is being promoted in Japan. The Ministry of Education, Culture, Sports, Science and Technology (MEXT) (2018) has stated that efficient knowledge transfer should be deployed in everyday lessons. We should make the most of the advantages of knowledge acquisition learning, which has been our learning policy. However, we need to integrate the benefits of inquiry-based learning that cultivates the qualities and abilities to promote the transference of knowledge. To enable the application of these ideas for teaching high school science, the development of Active learning lessons is required. Further, MEXT （2016） has also stated that a science room should have movable desks, water faucets, sinks, and other facilities for the application of these ideas and that it is necessary to provide instructions for experiments using information and communication technologies. In a study on the learning environment, Huang et al. (2019) stated that "education," "space," and "technology" interact with each other.

The application of Active learning in Japanese science education requires an assessment of using space and technology appropriately, as well as a preparation of the contents of the class. We believe that it is necessary to identify independent and interactive spaces appropriate for teaching the subject matter. Based on this, we conducted a web-based survey (13 questions, 5 items, free response method) on 56 science teacher-training students to determine whether they would use Active learning for science education. Specifically, we collected data on the respondents' attitudes toward Active learning in general classrooms and science laboratories.

The results showed that the science classroom had significantly higher scores for the following six items than the general classrooms: "The focus of student learning is on developing students' skills rather

than on knowledge cramming"; "The motivation of the students will be increased"; "Students can easily come up with solutions that are valuable to them"; "Students are anxious about attending classes"; "Teachers are anxious about teaching"; and "Students can easily analyze the experimental data." Therefore, it is suggested that a new science classroom should be designed to facilitate the use of Active learning for students and new teachers. Usually, students who engage in Active learning in universities ensure to incorporate it when they design classes as new teachers. Therefore, we believe that creating a learning environment that facilitates Active learning improves the quality of learning for students and enable them to learn comprehensively.

REFERENCES

Hung R., Spector J.M., Yang J. (2019) Learning Space Design, In Educational Technology(1st ed.), (Ronghuai Huang, J. Michael Spector, Junfeng Yang eds.) Springer, Singapore. 9:149-164

Ministry of Education, Culture, Sports, Science and Technology (2016). https://www.mext.go.jp/b_menu/shingi/chukyo/chukyo3/060/sonota/__icsFiles/afieldfile/2016/09/12/1376994.pdf

Ministry of Education, Culture, Sports, Science and Technology (2018). https://www.mext.go.jp/content/1407073_06_1_2.pdf

Utilizing Gesture Interaction to Improve Presence, Engagement and Realism of Virtual Experiment

Zhang Ling
1944324041@qq.com
Undergraduate Student
Southwest University
Chongqing , China

Xie Tao
xietao@swu.edu.cn
Associate Professor
Southwest University
Chongqing , China

Key words: Gesture Interaction, Presence, Engagement, Realism

ABSTRACT

A large library of studies reported that learners' engagement in virtual experiments is an important factor affecting the learning performance. Typically, the higher the engagement, the better the learning effect (Kim C., Park S.W., & Cozart J., et. al, 2015; Nolen S.B., & Koretsky M.D., 2018). The sense of presence is one of the key factors to improve students' learning experience (Yang J.C., Quadir B., & Chen N.S., et. al, 2016), and the realism of scenes in virtual reality has a significant impact on the sense of presence (Cheng K.H., & Tsai C.C., 2019). Therefore, it is of great significance to improve the realism, sense of presence and engagement in virtual experiments.

However, there is a big difference in handling objects between virtual experiments and real world, which leads to low realism of virtual experiments and weak sense of presence. Integrating the gesture interaction technology into the virtual experiment helps students interact better with the virtual experiment system. Based on quasi-experimental research design (Witmer B.G. ,1998), this study used the modified Igroup Presence Questionnaire (IPQ, Cronbach's alpha = 0.89) to investigate the influence of gesture interaction on learners' sense of presence, engagement and realism. 30 subjects were invited to participate in the experiment, and each subject reported no experience with virtual experiments or virtual games. They were randomly divided into two groups: one group did gesture interaction experiment and the other group did handler interaction experiment. At the beginning of the experiment, the two groups of subjects were provided guidance of system. The experiment lasted for 25 minutes. At the end of the experiment, learners were asked to fill in the IPQ questionnaire. The paired sample T-test was used to measure the extent to which they exhibit differences between the gesture interaction group and the handler interaction group.

Pearson correlation was used to analyze the correlation between learners' sense of presence, engagement and realism in gesture interaction.

The experimental results show that: 1) Compared to the virtual experiment of gamepad interaction, the virtual experiment of gesture interaction has a significant improvement in realism, students' sense of presence and engagement; 2) There is a significant correlation between realism, presence, and engagement. More specifically, the improvement of realism leads to the improvement of sense of presence, and the enhancement of realism and sense of presence promotes the improvement of student engagement.

In conclusion, integrating gesture interaction technology into virtual experiments is an effective way to improve the realism, sense of presence and engagement in virtual experiments.

REFERENCES

Nolen S.B., & Koretsky M.D. (2018). Affordances of virtual and physical laboratory projects for instructional design: impacts on student engagement. IEEE Transactions on Education, 61(3), 226-233.

Kim C., Park S.W., Cozart J., Lee H. (2015). From motivation to engagement: the role of effort regulation of virtual high school students in mathematics courses. Educational Technology & Society, 18(4), 261-274.

Yang J.C., Quadir B., Chen N.S., Miao Q. (2016). Effects of online presence on learning performance in a blog-based online course. The Internet and Higher Education, 30, 12-20.

Cheng K.H., & Tsai C.C. (2019). A case study of immersive virtual field trips in an elementary classroom: Students' learning experience and teacher-student interaction behaviors. Compute Education, 140.

Witmer B.G. (1998). Measuring presence in virtual environment: A presence questionnaire. Presence teleoperators &virtual environment, 7(3), 225-240.

Nudge for Instructional Design and Technology Toward to One to One Computer in Educational Environment

Kyoichi Yokoyama
1719528@ed.tus.ac.jp
Master student
Department of Mathematics and Science Education, Graduate School of Science, Tokyo University of Science
Tokyo, Japan

Tadashi Misono
misono@edu.shimane-u.ac.jp
Associate Professor
Fundamental Mathematics Education Faculty of Education, Shimane University
Shimane, Japan

Rieko Inaba
inaba@tsuda.ac.jp
Associate Professor
Development of Computer Science, Tsuda University
Tokyo, Japan

Yuki Watanabe
wat@rs.tus.ac.jp
Associate Professor
Department of Mathematics and Science Education, Graduate School of Science, Tokyo University of Science
Tokyo, Japan

Key words: Nudge, SR. ICT, NoTAS

ABSTRACT

In the field of educational technology, there has been a lot of discussion about supportive measures, such as self-regulated and co-regulated learning, as well as research on learning strategies. However, there is little debate on how to teach learning skills, including self-regulated learning, within specialized subjects. First, it is difficult to place classes that teach self-regulated learning or learning strategies themselves. This is because lesson content is a subject in primary and secondary education.

Based on the above, we thought that the learning efficiency could be improved by providing feedback to learners in a classroom environment where each learner has a tablet device, and their responses show whether they acquired knowledge based on the teaching information. Therefore, we applied *nudging*, a concept well known in the field of behavioral economics, to the field of education. According to Thaler and Sustein (2008), a *nudge* may be defined as any aspect of the choice architecture that alters people's behavior

in a predictable manner, without forbidding any options or significantly changing their economic incentive. Damgaard and Nielsen (2018) suggested that educational nudges, which provide information and assistance to learners, may unconsciously influence their behavior just like pure nudges in behavioral economics. Nudge studies have been conducted in a variety of educational fields, and they have identified 12 categories of research and practice. For example, they note that the social comparison nudges are more effective if they provide information about the behavior of others without providing a relative performance feedback.

The purpose of this paper is to examine the possibilities and directions of real-time support for learning strategies during classes. As a result, the possibility of support is mentioned using the concept of nudge. We believe that this support method may be a good solution considering the current situation with information and communication technology in school education. We plan to demonstrate this in the future as we develop the system.

In conclusion, this system encourages learners to learn from their peers during class and asks them to display their learning strategies in a notebook on their tablet device, thereby enabling metacognition, review of their learning strategies, and reflection on how to proceed with their learning in terms of putting strategies into action. During class, learners learn how and when to improve their learning using their peers' nudging.

REFERENCES

Thaler, R.H., and Sunstein, C.R. (2008) Nudge: Improving Decisions about Health, UK, Wealth, and Happiness

Damgaard, M.T., and Nielsen, H.S. (2018).:Nudge in Education, Economics of Education Review., 64: 313-342

Integrating vicarious failure into learning from cases: A conceptual framework for the development of failure cases and scaffolds

Jongchan Park
nmb0172@gmail.com

Dongsik Kim
kimdsik@hanyang.ac.kr
Professor
Hanyang University
Seoul, South Korea

Key words: Case-based learning, Failure case, Scaffolding, Vicarious failure

ABSTRACT

Failure has proved to be conducive to learning, regardless of whether it is first-hand or vicarious (Darabi et al., 2018; Tawfik et al., 2015). Researchers have explored various methods for utilizing failure as a productive experience in learning, including the productive failure (PF) approach (Kapur, 2012), failure-based case library learning (Tawfik & Jonassen, 2013), studying erroneous examples (Große & Renkl, 2007), and observing vicarious failures prior to lectures (Hartmann et al., 2020). This study examines the integration of vicarious failures into learning from examples and cases and does not consider first-hand failures. It may be both illogical and impractical to encompass both types of failure within a single theoretical lens (as highlighted in the differences between example-based learning and problem-based learning), though both types of failure have significant implications for learning.

Although the aforementioned studies apparently share a common belief in the beneficial effects of vicarious failures on students' future performances, some inconsistencies still remain regarding the timing of the failure experience (i.e.., when to embed failure in instruction; Große & Renkl, 2007; Huang, 2017), scaffolding strategies (i.e., the extent to which teachers need to help students benefit from failure; see Hartmann et al., 2020), and the relative effectiveness of vicarious failure in comparison to first-hand failure (Kapur, 2014). These inconsistencies may largely result from differences in learning domains (e.g., math, science, business management) and instructional methods (e.g., example-based learning, problem-based learning, observational learning).

Despite the inherent differences, however, it is still noteworthy that research on learning from failure indicates that instructional design strategies are necessary in order to ensure the optimal use of cases of failure as learning resources (Tawfik et al., 2015; Rong & Choi, 2019). Therefore, it is important to develop practical guidelines for developing and implementing combined failure- and case-based instruction in education. For example, the type and degree of failure (e.g., represented in worked examples, narratives, or

videos; well-designed didactically or with authenticity; Hartmann et al., 2020) may largely determine the effectiveness of each instructional approach using failure as a learning resource. Similarly, the extent to which learners are encouraged to reflect upon process-oriented aspects of failure, such as initial expectations, intentions, expectation failures, and subsequent explanations (Schank, 1999), may account primarily for the productive drive produced by failure.

In addition, exploring design strategies in terms of failure representation and learner engagement in the failure process also has significant implications for developing and providing scaffolding in learning from vicarious failure. Unlike experienced practitioners, novice learners often fail to elaborate errors in erroneous examples (Große & Renkl, 2007) and cases presented in narrative form (Park et al., 2020), prioritize extracted issues (Tawfik et al., 2019), and reuse the lessons learned from case studies when solving relevant problems (Bennett, 2010; Park et al., 2020). These expert-novice differences in making use of failure indicate that appropriate scaffolding strategies are necessary in learning from failure cases. Furthermore, as the need for scaffolding derives from learners' lack of experience, learning from vicarious failure may realize its full potential when the true extent to which practitioners experience failure is well represented. In brief, the representations of vicarious failure in cases offer significant implications as to the scaffolding strategies needed to promote learners' meaningful engagement.

Thus, the goal of this study is twofold. First, the authors will examine theoretical design strategies for failure case development: what elements of the failure process and outcome need to be integrated into cases, how these pertinent elements should be integrated into cases, and how learners should be required to engage in the failure-related aspects of cases. Based on the theoretically justified solutions to these questions, this study will then suggest scaffolding strategies for successful learning from vicarious failure.

REFERENCES

Bennett, S. (2010). Investigating strategies for using related cases to support design problem solving. *Educational Technology Research and Development, 58*(4), 459-480.

Darabi, A., Arrington, T. L., & Sayilir, E. (2018). Learning from failure: A meta-analysis of the empirical studies. *Educational Technology Research and Development, 66*(5), 1101-1118.

Große, C. S., & Renkl, A. (2007). Finding and fixing errors in worked examples: Can this foster learning outcomes?. *Learning and instruction, 17*(6), 612-634.

Hartmann, C., van Gog, T., & Rummel, N. (2020). Do examples of failure effectively prepare students for learning from subsequent instruction?. *Applied Cognitive Psychology, 34,* 870-889.

Huang, X. (2017). Example-based learning: Effects of different types of examples on student performance, cognitive load and self-efficacy in a statistical learning task. *Interactive Learning Environments, 25*(3), 283-294.

Kapur, M . (2012). Productive failure in learning the concept of variance. *Instructional Science, 40*(4), 651-672.

Kapur, M. (2014). Comparing learning from productive failure and vicarious failure. *Journal of the Learning Sciences, 23*(4), 651-677.

Park, J., Park, C., Jung, H., & Kim, D. (2020). Promoting case indexing in case library learning: Effects of indexing prompts on self-explanation and problem solving. *Journal of Computer Assisted Learning*. Advance online publication.

Rong, H., & Choi, I. (2019). Integrating failure in case-based learning: a conceptual framework for failure classification and its instructional implications. *Educational Technology Research and Development, 67*(3), 617-637.

Schank, R. C. (1999). *Dynamic memory revisited*. Cambridge University Press.

Tawfik, A. A., Gill, A., Hogan, M., York, C. S., & Keene, C. W. (2019). How novices use expert case libraries for problem solving. *Technology, Knowledge and Learning, 24*(1), 23-40.

Tawfik, A. A., & Jonassen, D. (2013). The effects of successful versus failure-based cases on argumentation while solving decision-making problems. *Educational Technology Research and Development, 61*(3), 385-406.

Tawfik, A. A., Rong, H., & Choi, I. (2015). Failing to learn: towards a unified design approach for failure-based learning. *Educational Technology Research and Development, 63*(6), 975-994.

The automatic evaluation model for argumentative interaction in debating chat-bot program

Kukhyeon Kim
Kukhyeon8@gmail.com
Doctoral student
Chonnam National University
Gwangju, South Korea

Chaeyeon Kim
Rlacodus0224@gmail.com
Master student
Chonnam National University
Gwangju, South Korea

Min Cho
mloje98@gmail.com
Undergraduated -Master student
Chonnam National University
Gwangju, South Korea

Jeeheon Ryu
Jeeheon@jnu.ac.kr
Professor
Chonnam National University
Gwangju, South Korea

Key words: automated assessment, debating chat-bot, logistic regression

ABSTRACT

The purpose of this study is to propose an automated evaluation method for the argumentative essay on the debating chat-bot program. The final goal of this study is to develop an automated evaluated system for argumentative essay and this study is one of the steps in the process of the final goal. This study dealt with what to consider when evaluating argumentative essays and suggested the basic method to classify the essay into different levels.

For this study, firstly, 28 argumentative essays were collected from undergraduate students while they interacted with the debating chat-bot. The debating chat-bot program was developed to promote the argumentative competency. In this program, the participants interacted with the debating bot by writing their own opinion with the thesis and reasonable supporting ideas on the computer. They usually write down one paragraph for 5-10 min (Ryu, Kim, & Jeong, 2019). The theme of the debating was ‘Is it a fair

statement that Jean Valjean was sentenced to five years in prison for stealing bread?'. The participants read the same text to unify their prior knowledge.

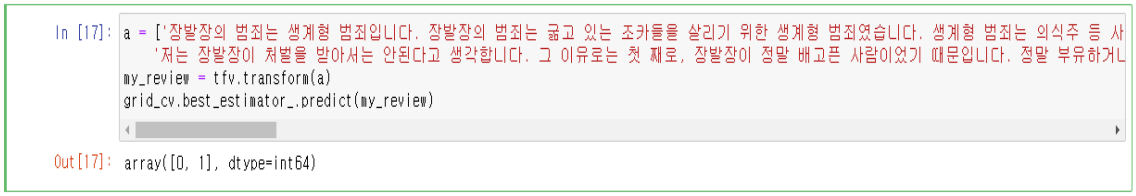
Secondly, the researcher evaluated 28 argumentative essays based on these assessment criteria. The criteria of the argumentative essay are content, structure, and expression (Kim, 2020). The content component is that the supporting ideas are reasonable and the ideas are clear. The structure is about coherence between the thesis and its supporting ideas. The expression is about grammar and proper word usage. Each element has three sub-components and the total assessment components are nine ones(Lee, 2017).

And then k-mean classification analysis was used to identify how many levels the collected essay could be distinguished. As a result, the essays could be divided into two classes, upper level, and lower level.

Next, one-way ANOVA analysis was conducted to identify which assessment components could explain the classification among the three criteria. As a result, the content (F=13.97, p=.001) and the structure element (F=20.26, p=.000) could explain the classification much better than the expression element (F=11.42, p=.002).

And then 26 essays were used to identify the word features of the level of the essay the levels by using Korean national language processing(Ko-NLP). The feature is extracted from the frequency of the words in each level essay (Choi, 2010). 'TfidfVectorizer' from 'sklearn.model_selection' was used in the Python environment. N-gram was min. 1word and max. 2words. logistic regression was used to classify the essay into high and low levels.

Finally, two final verification texts confirmed that 'text 27' was '0' and 'text 28' was '1' as shown in [picture 1]. '0' means a low level of essay assessment and '1' means a high level of essay. 'Text 27' was assessed into a lower level essay and 'text 28' was done into an upper-level essay from the evaluator. Therefore, it verifies that this machine learning system is working.



[picture 1] the result of logistic regression in python program

The conclusion is that firstly it was confirmed that the evaluation method, which distinguishes the level of writing, can be used as a way of grading the debating chat-bot program. Logistic regression is likely to be available when separating the level of essays into two categories. This result shows how to evaluate the argumentative essay. However, the study has the following limitations: First, the number of the essay

was limited to 28 texts as a pilot scale. For future study, more than 200 discussion articles are needed for sufficient model training.

REFERENCES

Choi, J. (2010). Comparative Study of Methods of Computing Scores in a Automated Scoring Program for Constructed Response Items:Focused on a Regression Analysis and a Bayesian Approach (master's thesis). ChongNam University, South Korea.

Lee, S. (2017). A Correlation Analysis of Coherence and Cohesion in High School Students' Essays through Topic Modeling. Korean Lanaguage Education Reseach, 52(3), 135-162.

Kim, S. (2020). A Study on the Automatic Feedback Method of Persuasive Essays Using Python (doctoral dissertation). Korea National University of Education, South Korea.

Ryu, J., Kim, K., % Jeon, M. (2019). The Consideration Fctors of Ethical Bias for Debate Bot. The Digital Ethics, 3(2), 63-76.

How Enhancing Learning Motivation Using ICT as a Learning Environment in International Collaborative Learning

Yuki OMACHI
yukichima00@gmail.com
Undergraduate student
Meisei University
Tokyo, Japan

Yoshiki OTSUKA
yoshi.19990228@gmail.com
Undergraduate student
Meisei University
Tokyo, Japan

Maiko KAWANO
mymai8toshi@gmail.com
Undergraduate student
Meisei University
Tokyo, Japan

Takayuki KONNO
konno@t-konno.net
Associate professor
Meisei University
Tokyo, Japan

Key words: Learning motivation, ICT, Learning environment, Elementary school, International collaborative learning

RESEARCH OBJECTIVE

The purpose of this research was to clarify how teachers enhance students' motivation using ICT as a learning environment in international collaborative learning.

RESEARCH METHODOLOGY

The authors interviewed the teacher who continues to conduct international collaborative learning with BYOD in elementary school. The authors had about 2-hour interviews through ZOOM with the teacher in June 2020.transcribed based on the KJ method (Kawakita,1967). The KJ method is a recognized way of organizing and stringing together stored associated information together for analysis. By applying this method, we considered the information from various angles rather than simply aggregating the interviews together. Through this process, we could gather together groups and showed them diagrammatically.

FINDINGS and DISCUSSION

As a result of the analysis, the following five points were determined.

To make children study in a group composed of a small number of them to take responsibility as a member.

To do the review by a portfolio of their learnings.

To set a goal depending on their levels by observing their air and reflection.

To advise while grasping their activities using iPad.

To set a time limit for offering their ideas within the day to note their thoughts.

In conclusion, a cycle of practicing and reflection is critical because students need to think ways to approach their goals. We considered the teacher made them submit reflections every class to make them check a task and trim their goals.

As for future research directions, it will be necessary to invest how to assimilate a cycle of practicing and reflection effectively to keep motivation for learning with or without ICT in the public elementary school.

REFERENCES

Ichikawa, Y. (2020). The Effects of Collaborative Learning with ICT in English Class. *Journal of National Institute of Technology*, Toyota College, 52: 33-42

Inoue, K. (2019). Blended Learning in BYOD Environments in Higher Education. *Studies on education*, 12: 113-124

Ishii, Y., Kurokami, H., Taizan, Y. & Tonoe, T. (2018). Effective utilization of NHK School broadcasting programs in international understanding learning. Kokusairikaigakusyu ni okeru NHK housoubangumi no koukatekikatsuyou. 44th Japan Association for Educational Technology, JAPAN

Kanazawa, M. (2017). Attempts at Directing Students Towards Autonomous Learning. *Journal of KIBI International University*, Suppl: 123-130

Kawakita, J. (1967). *Idea method-for creativity development*. Chuokoron-Shinsha public company, Tokyo, Japan

Factors that may Promote First-Year-Student Motivation in Online Classes in Higher Education

MATSUKI, K.
eu170263@meiji.ac.jp
Student
Meiji University
Tokyo, Japan

JUN.J.
eu180032@meiji.ac.jp
Student
Meiji University
Tokyo, Japan

TERABE, Y.
eu180114@meiji.ac.jp
Student
Meiji University
Tokyo, Japan

YAMADA, S.
eu170275@meiji.ac.jp
Student
Meiji University
Tokyo, Japan

Key words: Motivation, Online class, Communication, Interaction

ABSTRACT

1. RESEARCH BACKGROUND
Due to the COVID-19 pandemic, face-to-face classes in higher education are prohibited for the time being. Therefore, university students take online classes instead. An appetite for learning is studied as 'motivation' in Psychology. According to Deci (1975), there are two types of motivation: Extrinsic Motivation and Intrinsic Motivation. Intrinsic motivation is from within learners and can be promoted or lowered depending on various factors in classes. The authors focused on class design. The reason is that the design of online classes is much different from face-to-face classes.

First-year students take online classes without vertical or horizontal social relationships in a big change of learning environment from high school to university. The authors have an awareness of the educational problem with that. As regards online classes, there are two types: real-time and on-demand. This study focuses on real-time online classes.

2. RESEARCH PURPOSE

In this research, the authors clarify the factors that promote student motivation to learn in real-time classes. This research is significant because it can provide knowledge for teachers that can be used as a reference when they design their online classes.

3. RESEARCH METHOD

We clarify which classes can motivate students to learn or not by asking them to compare their experiences. In this research, as a method, we conducted a questionnaire investigation. The target is first-year students of the School of Global Japanese Studies at Meiji University to which the authors belong. We requested participation via SNS, and 83 students answered. We asked the following two questions on the questionnaire: 1) Which classes can promote their motivation in real-time online classes, and why, and 2) Which classes cannot keep their motivation in real-time online classes, and why. We found similar and different points by using the KJ method.

4. RESULTS

4.1 Characteristics of online classes which motivates students

As a result of the analysis, as to the online classes that motivate students, there are two factors: 1) The fact that students have a sense of involvement in a class, especially classes that give a chance to interact with others and to express one's ideas; and 2) Students tend to be satisfied with classes each teacher thoroughly understands the characteristics of real-time classes on the internet and make use of them. Students judge at all times whether a form of class is an appropriate way to learn content or not.

4.2 Characteristics of online classes which don't motivate students

Some factors decrease student motivation in a class, especially when the form of class is not appropriate for the content. In addition, lack of explanation for assignments and not enough teacher feedback about submitted assignments make students uneasy. When students have questions about class content, they cannot ask them easily. By introducing online classes, the physical distance between teacher and student is greater. It causes a mental burden for students when they try to contact their teachers. We conclude that it is important to maintain and increase student motivation.

5. Discussion

From the results of the questionnaire, it was found that the main factor affecting student motivation to study in class was the presence or absence of communication. When students take real-time classes, it is difficult to understand the class content and feedback on their own assignments. Therefore, there are three factors that motivate students to learn in real-time classes.

1. Whether or not there is an opportunity to improve students' sense of participation in the class.
   A student can improve their desire to learn by participating and interacting in the class independently. According to a previous study by Yoshitaka Mitate et al. (2008), communication between students does not significantly impact the factors that define the desire to learn and satisfaction of school life in face-to-face classes. However, our research showed that communication between students is one of the factors that keeps students motivated to learn. We speculate the reason is a lack of informal communication outside of class.
2. Whether or not there is a communication environment between teachers and students.
   It was found that many students were concerned about how to solve the questions raised about the classes they were taking and how teachers evaluated their assignments they had done. Communication between teachers and students is also important to dispel such anxiety and create an environment where we can concentrate on learning.
3. Clarification of the goals and evaluation criteria for classes.
   Teachers and students are not in the same space, so teachers need to clarify their goals and share them with students. To prevent a discrepancy in perception of the class between teachers and students, it is necessary to clarify the criteria of evaluation and achievement goals in classes.

Based on the findings, the authors conclude that teacher communication about goals and evaluation methods is a key factor in raising student motivation levels. With the transition to online classes, the number

of submission-type assignments has increased. It can indicate that this is increasing psychological anxiety about the evaluation criteria of students' classes. Clarification and sharing of attainment targets and feedback on issues are therefore especially important in online classes.

6. Future Consideration and Future Direction

In this research, the authors focused on real-time classes which have interaction sessions. However, some classes do not have these sessions due to class content. In future research, the authors intend to clarify factors that promote and increase student motivation for online classes without interaction sessions.

Another point to consider is online classes from the perspective of a teacher. In this research, we only analyzed the student questionnaire. In the future, we will clarify the results of individual analysis through a semi-structured interview.

REFERENCES

DECI, E. L. (1975). Intrinsic Motivation. *Plenum Press*.

MITATE, Y., NAGAI, M., KITAZAWA, T., UENO, J. (2008). About university students' motivation for learning and factors that specify satisfaction of university life. *Journal of Japan society for educational technology*. 32(2) pp. 189-196.

MIZOKAMI, S. (1996). University students' motivation. *Kyoto University Research Information Repository*.（2） pp. 184-197

The Implementation Status of Active Learning of Group Activities in the Comprehensive Practical Activity Curriculum of Primary Schools in China

Yin Lingfei
K661955@kansai-u.ac.jp
Undergraduate student
Kansai University
Osaka,Japan

Kubota Mayumi
mkubota@kansai-u.ac.jp
Professor
Kansai University
Osaka, Japan

Key words: active learning, comprehensive practice and activity course, group work

ABSTRACT

The purpose of this study is to clarify and solve problems in group work by conducting conversation analysis using a recording pen in order to enhance the active learning effect of students in the comprehensive practical activity class of elementary school students. The Chinese Ministry of Education aims to strengthen the overall design of the lesson with the announcement of the "Guideline for Elementary and Junior High School Comprehensive Practical Activities Class"（2017）.

This course provides an independent learning space and aims to clarify problems and solve problems by utilizing active learning through group discussion and group work centered on the group. However, in mathematics classes Wang (2002) was pointed out to have problems such as imbalance in student participation, lack of deep interaction, not active learning, and inability to achieve class learning goals. Not only mathematics, but comprehensive practical activity courses also have similar problems. Wan (2014)putted forward the problems that are easy to appear in the group activity independent study of the comprehensive practical activity course. For example, the degree of participation is not only unbalanced, the purpose of the task during group work is not clear, the division of roles is not well done, and lack of deep interaction. These problems in group cooperation are factors that restrict the curriculum and may lead to a decline in education. Therefore, specific issues need to be clarified and resolved. In this study, during the groupwork of the fifth grade, the recording pen will be placed in each group, and the students' conversations were analyzed to find problems. After class, we will interview students and teachers, in order

to improve the effectiveness of active learning. Then the results will be discussed in terms of introducing rubric for future research.

REFERENCES

Head of Ministry of Education. (2017).[homepage]*The head of the Textbook Bureau of the Ministry of Education answered reporters' questions* Retrieved from http://www.gov.cn/zhengce/2017-10/30/content_5235339.htm

Wan,W. (2014).*From sitting together to cooperation Analysis on the Problems of Group Cooperation in Comprehensive Practice Activity Course.* Contemporary Educational Science.,6:24-25

Wang,Y. (2002).*Problems in Group Cooperative Learning in Primary School Mathematics Teaching and Co-solving Strategies.,*8:34-36

Emotion recognition by measuring EEG and pupil diameter in virtual reality simulation

Eunbyul Yang
yangbyul2@gmail.com
Doctoral Student
Chonnam National University
Gwangju, South Korea

Sungmin Lim
min70161@gmail.com
Master Student
Chonnam National University
Gwangju, South Korea

Museok Jeong
splashwjd@gmail.com
Master Student
Chonnam National University
Gwangju, South Korea

Jeeheon Ryu
jeeheon@jnu.ac.kr
Professor
Chonnam National University
Gwangju, South Korea

Key words: Emotion, EEG, Pupil Diameter, Virtual Reality Simulation

ABSTRACT

This study uses EEG and pupil diameter measurements to evaluate the user's emotional status in a virtual reality learning environment(VRLE).

The AES(Artificial Emotion System) is a model that calculates emotions by imitating human cognitive and emotional systems(Rosales, Rodríguez & Ramos, 2019). VRLE with an AES can achieve the purpose of virtual-reality based interactive simulation such as social skill training, physical rehabilitation, and logical problem solving by making users actively interact. As a first step in applying an AES to VRLE, it is necessary to evaluate users' emotions using VRLE.

In this study, users' emotions were assessed based on the Arousal-Valence model when he talks to the virtual avatar in VRLE. The virtual avatar used in the study stimulates users' emotions with swear words and sarcasm. While the user's emotions are stimulated, two psychophysiological data are collected: EEG and pupil diameter. EEG was collected through Epoc+, which has 14 channels of measuring brain waves

noninvasively. Only four of these channels were used in the study and are all located in the frontal lobe. The extracted EEG was converted to five frequencies via FFT(Fast Fourier Transform). For measuring pupil diameters, FOVE, the head-mounted display, was used. With FOVE's infrared camera, the user's pupil sizes were collected in real time. EEG and pupil diameter are sent to VRLE in real-time and converted to levels of arousal and valence. Arousal was calculated from the values of alpha and beta waves collected from four channels. Valence was calculated by comparing brain waves collected from left & right brain channels (Blaiech, Neji, Wali & Alimi, 2013). The arousal and valence calculated in real time are converted to a real-time lot and appear on the dashboard. The dashboard is not visible to the user, but visible to the observer. The dashboard also reports changes in users' pupils, by drawing a time series graph of the pupil diameter being collected in real-time. This process shows how the user's emotions change during interaction with VRLE's virtual avatar.

REFERENCES

Rosales, J. H., Rodríguez, L. F., & Ramos, F. (2019). A general theoretical framework for the design of artificial emotion systems in Autonomous Agents. Cognitive Systems Research, 58, 324-341.

Blaiech, H., Neji, M., Wali, A., & Alimi, A. M. (2013). Emotion recognition by analysis of EEG signals. In 13th International Conference on Hybrid Intelligent Systems (HIS 2013) (pp. 312-318). IEEE.

Student apartment design by students - a fieldwork to create a space to connect with the local community

Maho Suzuki
T418033@m.chukyo-u.ac.jp
Undergraduate student
Chukyo University
Toyota, Japan

Yoshiro Miyata
miyata@sist.chukyo-u.ac.jp
Professor
Chukyo University
Toyota, Japan

Key words: public, private, student apartment design, fieldwork, local, boundary, community

ABSTRACT

In a three-day fieldwork/workshop students and teachers from several universities collaborated to design a student apartment in Hakodate city. Through interviews of some participants an interesting pattern emerged that can be described as “blurring the boundary between inside and outside” in three domains: personal life, group activity, and living space. In personal life, each individual seems to set a psychological boundary to protect one’s feelings while interacting with others. In group activity, each individual seems to set a limit in expressing one’s thoughts to other members. During the fieldwork the members had some opportunities to adjust their boundaries flexibly when they met some people in the community. In their discussion after the fieldwork about the living space they wish to live in, they came up with many ideas to facilitate communication between themselves and people in the community by “blurring the boundary between private and public”.

To illustrate I will describe my own experiences as an example. Reflecting on my own experience in the three-day fieldwork/workshop I realized that I had two preconceptions. First, I had a preconception that “a student apartment is a private space where you just have your personal life like have a meal, sleep and enjoy your hobbies.” My second preconception was that I should not say incorrect nor strange ideas so I was trying to draw a line between good and bad ideas. From these preconceptions, I was trying to have a clear line between public and private so as to keep public from entering private vice versa.

However, as I interacted with the local environment and people in the field work, saw the members of the team developing various unique ideas, and spent time with the people I met first time at the workshop, I felt my boundary between public and private became ambiguous. I realized that I could enjoy and learn much more by making my boundaries unclear, although I wasn’t aware of it then. I felt my ideas connected

with other members' ideas and contributed to a better design. Our group designed an apartment with a library and a cafe on the first floor open to local people so that the students can interact with them.

In the presentation I would like to analyze interviews of some other participants and discuss how these three domains were connected, and its implications to personal growth (Wilber 2000).

REFERENCES

WILBER, K. (2000). *No Boundary*. Shambhala Publications.

Improving Online Learning Environment for Foreign-Born Children −Distance Education during COVID-19 pandemic in the United States−

Shoko Tange
15shokotan6w@u-sacred-heart.ac.jp
Doctoral Course Student
University of the Sacred Heart
Tokyo, Japan

Key words: Distance learning, Online learning, Foreign-born Children, Parental engagement

ABSTRACT

Distance education, in the form of fully online or blended learning, is becoming more widely used in the kindergarten through grade 12 (K-12) education (Caruth & Caruth, 2013). Online learning is also becoming more appealing to exceptional learners, because they have more control over the pace and place of learning, and it is more focused on their needs (Currie-Ruben & Smith 2014). Due to the COVID-19 pandemic, online classes have been introduced for elementary school students worldwide. However, few studies have focused on how to support foreign-born children who are not fluent in a second language. Therefore, this research focuses on the academically weaker foreign-born children in the US, through interviews to reveal the support needed for online learning.

The author conducted semi-structured interviews on five mothers of academically weaker Japanese children in the US. Open-ended questions were asked regarding the content of the class, homework, and teacher and parental support. The interviewees comprised a resident each from San Francisco, New York, Carmel, and two from San Diego. The children were aged five to ten. The average length of their stay in the US is ten months.

Online learning is not the same as face-to-face classes because they involve totally different teaching material, learning atmosphere, and stimulation from friends. Therefore, the teacher needs to take these factors into consideration so that home learning can be done smoothly. However, according to the interview, the most serious problem lies in the absence of parental engagement frameworks in online learning despite the fact that parental engagement is an essential requirement in this learning method.

Parents can have an even greater impact on their children's online learning than in traditional course, especially when students take most or all of their courses online (Liu et al 2010). Previous research also indicates that it is challenging to establish meaningful frameworks in less mature fields such as parental engagement in online settings (Gibbons et al 2014).

In order to reduce the parent's burden in online learning, support for the parents is required, the particular needs of working parents need to be accounted for as well as those of families with more than one child. Therefore, these nine changes will need to be incorporated in designing online learning content: 1) allocation of chatting time for children, (2) communication between homeroom teacher and parents, (3) smaller groups for the class, (4) inclusion of mathematics and writing in online learning, (5) Imparting IT skills and internet literacy from kindergarten, (6) lectures about homework, (7) establishing an online information exchange community, (8) give detailed instructions, and (9) adding video record function.

However, it is difficult for schools to incorporate all such changes. It is hoped that a support community will be established which takes guidance from specialists in the field in providing information regarding the usage of the device, mental care, and translation services for foreign families. These are essential requirements in creating a comprehensive design of online learning content for schools, parents, and support community working together.

Besides, for foreign families, it might greatly influence parental information utilization ability and language skills on the children's learning. These are also issues which need to be tackled in the future.

REFERENCES

Caruth, G. D., & Caruth, D. L. (2013). Distance education in the United States:From correspondence courses to the internet. Turkish Online Journal of Distance Education (TOJDE), 14(2), 141-149. doi:10.1080/01587910500168892

Currie- Rubin, R. & Smith, S. (2014). Understanding the roles of family in virtual learning. Teaching Exceptional Children 46(5), 117-126. doi: 10.1177/004005991453010

Graham, C. R., Henrie, C. R., & Gibbons, A. S. (2014). Developing models and theory for blended learning research. In A. G. Picciano, C. D. Dziuban, & C. R. Graham (Eds.), Blended learning: Research perspectives (Vol. 2, pp. 13 - 33). New York, NY: Taylor & Francis.

Liu, F., Black, E., Algina, J., Cavanaugh, C., & Dawson, K. (2010). The validation of one parental involvement measurement in virtual schooling. Journal of Interactive Online Learning, 9(2), 105-132. Retrieved from http://www.ncolr.org/jiol/issues/pdf/9.2.2.pdf

Research on the application of online teaching model during the COVID-19 pandemic

Qiuyu Pu
qypu@mails.ccnu.edu.cn
Master student
Central China Normal University
Wuhan, China

Key words: online teaching, information technology, curriculum design

ABSTRACT

To reduce the COVID-19 pandemic impact on teaching, teachers in various schools actively carry out online teaching. Large scale online teaching practice has injected new technologies and new ideas into traditional teaching, comprehensively promoted the deep integration of information technology and education teaching, and promoted the teaching revolution of various schools. Under the unified deployment and arrangement of the Ministry of education, the whole country has formed a unified command, coordination and linkage organization and management system, which actively provided technical support for online education throughout the country. The country has built a variety of curriculum resources with physical and mental health as the core, formed a reasonable and scientific curriculum arrangement, and innovated the use of a variety of network teaching methods.

However, the large-scale online teaching practice also exposed some problems. The national information public infrastructure is not perfect, the regional development is not balanced, and the educational information infrastructure in some regions is weak, which is difficult to support the actual demand. The overall information awareness and application ability of teachers are low, the integration depth of information technology and teaching needs to be strengthened, the innovation of education and teaching is insufficient, and there is a big gap between the quality requirements of digital teachers in the new era. There are many kinds of teaching resources, but there is a lack of high-quality resources that meet the characteristics of students and meet the needs of students. The lack of communication between teachers and students in the teaching process leads to the low participation of students, which leads to the decrease of learning effect.

Therefore, We should speed up the improvement of national information infrastructure conditions, build intelligent teaching interactive environment, and strive to improve teachers' information literacy. Based on the online education mode, we need to reconstruct the personalized teaching with learner as the center, ability training as the focus and problem-solving as the guidance.

Consideration of the Activities in Which International Students Can Interact with Japanese Aged People and Learn Together

Toshiki Matsuda
md200139@n-fukushi.ac.jp
Graduate Student
Nihon Fukushi University
Nagoya, Japan

More than ten years have passed since the Japanese government launched a policy called Ryugakusei 30mannin Keikaku, aiming at accepting a maximum of 300,000 international students by 2020. And yet the Japanese rarely have the opportunity to interact with international students. However, increasing the opportunity between international and local students in school enables both of them to learn by interacting. Considering earlier studies on international students, the purpose of this research is to hold the activities for international students to interact with Japanese aged people and consider how it will influence them in terms of learning and interaction. To conduct this research, I will hold the activities at a nursing home and interview both international students and Japanese aged people before and after the activity (when this becomes possible). I think that creating opportunities for international students to interact with local people outside of school will enable them to acquire a new way of learning and lead local people to facing the globalization or diversity inside Japan. I hope that this opportunity will be the beginning for both foreigners and the Japanese to live hand in hand in a symbiotic society.

Key words: International students, Japanese (aged) people, Cross-cultural understanding, Symbiotic society

INTRODUCTION

More than ten years have passed since the Japanese government launched a policy called Ryugakusei 30mannin Keikaku (MEXT, 2008), which aims to accept a maximum of 300,000 international students by 2020. Owing to that, nearly three million foreigners, including international students have come to Japan, and they have helped Japan globalize itself. However, due to some crimes caused by foreigners, some Japanese people have had bad images of them. As a proof of this, some Japanese people have even made groups with racial prejudice to banish foreigners from Japan. This tendency might lead international students to struggling to continue their learning especially with Japanese students/people. Carroll (2005) indicates, increasing the opportunity between international and local students in school enables both of them to learn by interacting. Matsuda (2019) also found out that having informal activities between local and international students can let them start having a relationship with each other. Considering the above earlier studies, I decided to research how international students can have connection with non-students. The reason why having one with non-students is that international students will have to interact or learn with various people in their future especially after their graduation. Also, having human network outside of school will help them have another place for learning and staying in, which could help themselves fulfill their life in Japan.

PURPOSE

The purpose of this research is to clarify how international students enrich their learning and cross-cultural understanding through activities with local people, and how their perception of each other changes through an activity.

METHODS

I and some international students from some southeast Asian countries such as Vietnam, Sri Lanka, etc., will visit a nursing home and communicate with the aged people there. This visit is for both of them to get to know each other for the activity. I will reflect on the activity with a professor and international students to confirm how they have enriched their learning, and unique/new experience they have gotten. Interviews will be given to both international students and Japanese aged people at a nursing home before and after the activity to know how their feelings about each other have changed and clarify what could be the good/bad reason for it. The questions for the interview will be itemized through discussion with co-learners and a professor.

ACTIVITY AT A NURSING HOME

The content of the activity is mainly presentations about international students' cultural background and their life in Japan. Each presentation is given in 12 to 15 min. At present, three or four students are willing to join the activity and the number of participants is expected to increase. As for Japanese aged people, as the manager of nursing home says, they will teach international students about some old Japanese culture. It means that both international students and Japanese aged people will be in charge of holding the activity therefore it will not be one-sided.

RESULTS AND DISCUSSION

Due to the pandemic of coronavirus, none of the above methods are conducted. However, what is expected to confirm is that international students giving presentations will experience something unique through their presentations since they rarely have the opportunities to communicate with aged people, hence it will let them have another perspective of learning. Moreover, they will feel that they can have various human connection even outside of school, which could help them have a place to stay in. As for Japanese aged people, they will know that international students have done their best to continue their learning in Japan even though they have to work hard to keep their finances stable (to earn money for the tuition of school and house rent). However, it is possible for some Japanese aged people to feel difficulty in the

interaction with international students. Even if there is, I, co-learners, and a professor will elaborately analyze how it has happened and consider how it can be wiped away.

CONCLUSION

Through this research, I will find how important learning in Japan is for international students with locals, including non-students. It is implied that school is not the only learning environment which international students have. In other words, anywhere could be placed to continue or brush up their learning. Also, I think I will find how meaningful and difficult having activities between international students and locals is. Because of the differences in the way to communicate and the choice of words, it would be difficult for both locals and international students to have connection. However, it will enrich their cross-cultural understanding. Given the outcomes of this research, I will pursue the possibility which international students have with globalization inside Japan, and how it will lead us, both foreigners and locals the betterment of our life in a symbiotic society.

REFERENCES

Carroll, J. (2005). Multicultural groups for discipline-specific tasks: Can a new approach be more effective? In *Teaching international students*, 84-91,
Routledge.

Matsuda, T. (2019). Learning Environments to Activate International Students for Japanese Language Acquisition

MEXT (2008). The main points of “the plan to accept 300,000 international students” (□ □ □ 学□ □ □ □ □ □ □ 画□ □ □ □ in Japanese), https://www.mext.go.jp/_menu/koutou/ryugaku/_icsFiles/afieldfile/2019/09/18/1420758_001.pdf (2019-06-11)

Developing a Game-Based Educational Material focusing on English Communication in Primary Schools

Wataru Shibata
wataru.gk17@gmail.com
Undergraduate student
Meiji University
Kanagawa, JAPAN

Satoshi Kawashima
skawashima3104@gmail.com
Undergraduate student
Meiji University
Tokyo, JAPAN

Tammy Asakura
eu180517@meiji.ac.jp
Undergraduate student
Meiji University
Tokyo, JAPAN

Key words: Gamification, Interactive, Learning Activity

Research background and Objective

Along with the revision of the new curriculum guidelines, there were major changes in the class time and the purpose of conducting foreign language education at elementary schools from April 1, 2020 (MEXT 2017). The purpose of learning changed from "to get familiar with English, by hearing" and "to motivate students to learn English at junior high school." to "familiarize themselves with foreign languages focused on "listening" and "speaking" to increase motivation for learning" for the third and fourth graders and “to get familiar with listening, and then gradually add "reading" and "writing" to ensure systematic learning” for fifth and sixth graders.

Under such circumstances, it has been revealed that elementary school teachers are worried about teaching foreign language education starting in 2020. Uematsu et al. (2012) conducted a questionnaire of “What are the problems in teaching foreign language activities (Free description)”. "English skill, especially pronunciation" was the most common at 27%, “Increased burden and lack of teaching materials” (17%), “teaching skill” (13%), “no time to prepare with ALT” (6%).

Under these circumstances, “teacher training” has been conducted to get rid of teachers' anxiety. In the 2017 survey on the status of English education (MEXT 2017), prefectures and designated cities are conducting training in the school for elementary school teachers to improve their English skill and teaching skill over multiple days. However, there were few attempts to get rid of the anxiety about the lack of

material. Thus, the authors considered that a new approach of "material development", which is one of the anxiety factors in teaching foreign language education, was necessary. The new curriculum guidelines (MEXT. 2019) stipulates that students are encouraged to "deeply learn interactively and actively", so we decided to develop materials focusing on “interaction”.

In the foreign language classes of the elementary school, the materials should be familiar or interesting, and clarify the purpose of communication, and make concrete issues (Tono. 2019). To develop the material that promotes this "interactive" learning, we developed the card game materials in this research. In card games, by reading and teaching the materials printed in the tool, it is expected to have the effect of promoting active interaction along with the game. (Fujihira. 2018).

In this research, we developed a card game material concentrated on "interactive learning" for elementary school students. We will clarify the conditions to promote interaction in English, based on feedback from students.and analyze whether it was able to encourage children's independent conversation in English.

Overview of practice

The authors used the framework of gamification as a reference to develop the card game materials aimed at promoting English communication. Gamification is a method of applying “The way that makes people to be absorbed” in games to the learning activities (J. M. Keller. 2019). This method is divided into four ideas. First idea is to make the game simple and easy to use, so the players can intuitively understand without a manual. Second is to make the game rules understandable, which creates a system that does not confuse the players. Third is to make the players engaged, which is important to provide an engaging and a step-by-step experience of "becoming able to do something (getting stronger)".The fourth idea is reality. Although it is a game, it is required to provide a story and direction that players can relate to the real situation. These four features were incorporated in the produced educational materials to promote informational exchange, thinking skills, and further communication skills.

Research method

This study conducted a class using the developed teaching materials for 6th grade children (26 students) at A elementary school in Shibuya Ward on February 18, 2020. We observed and collected the data of the children in the class, then we conducted a paper questionnaire survey for them. In the observation record, the authors recorded the situation observed in class. The survey included the following questions: *(1) How much fun you had, (2) How much you spoke English, (3) How difficult it was.* The answers were obtained on the paper in a five-level evaluation.

Result

As a result of the observation record, the teaching material using the card game was able to generate interaction. In particular, it was found that the viewpoint of gamification was an effective means for promoting interaction. The following two conditions were found as necessary conditions to promote interaction in developing teaching materials. *(1) Use a familiar topic.* By choosing a theme that is familiar to the players, it was easy to get an idea of the situation and scene, which led to the interaction. *(2) Limitation of information amount.* It was found that by thinking in a limited amount of information, they had the opportunity to guess what to fill in with the missing information, which led to the interaction.

As a result of the children's questionnaire, the Figs. 1 to 3 were obtained. As shown in Fig. 1, more than half of the students (61.5%) who took classes using the developed materials chose the highest rating of 5 for how fun it was. The next most popular choice was 4 (19.2%), and it showed that less than 80% of the students enjoyed playing through the development game. *(2) How Much Could You Speak.* Fig. 2 explains the evaluations from the subjects regarding whether or not the English conversation was successful were concentrated in 3, 4, and 5. Assuming that 3 is "normal," it is clear that more than 80% of the students could talk in English more than ordinary through the developed game. However, while 61.5% of students rated the enjoyment of the game as 5, it was 23.1% rated as 5 in English conversation. Although many students enjoyed playing the game, it was found that the proportion of students who felt satisfied that they could speak English was proportionally low. *(3) How Difficult It Is.* As shown in Fig. 3, the students who found the game difficult and not difficult were almost equal. The highest number of votes is 31.5%, which is the middle class who feels neither found easy nor difficult and rated the difficulty as 3. The total proportion of children who chose 1 and 2 was 31.6%, and the total proportion of children who chose 4 and 5 was 36.8, which is slightly higher than the number of students who find the developed teaching materials not so difficult. From the result of the children's questionnaire. Thus, we found that it is necessary to consider the content and amount of interactions generated through the following card games and the difficulty as a condition for developing the card game teaching materials to promote interaction in English.

List of graphs for results of questionnaire to children

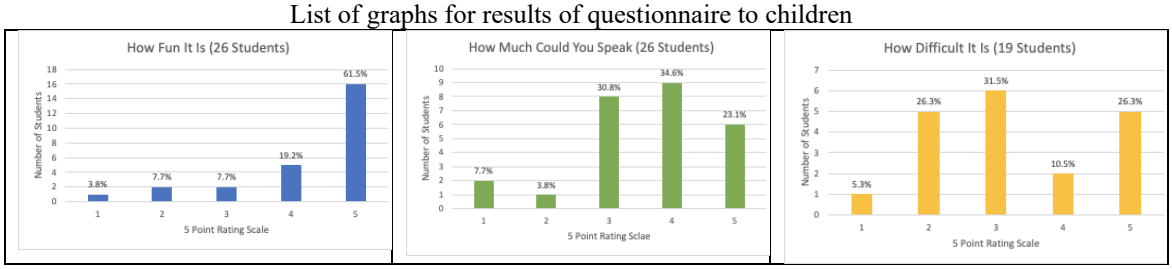


Fig. 1 "How Fun It Is " Fig. 2 "How Much Could You Speak " Fig. 3 "How Difficult It Is "

Analysis

As a result of a questionnaire survey of students who were involved in the development of teaching materials, "What kind of factor should we have to create an interaction?", the following improvements were

found. *(1) How to give children freedom to speak.* The question text of the question card used in this game was fixed. However, there was an opinion that the higher the degree of freedom, the easier it is for children to speak. As one of the concrete solutions, there was a plan to fill in the text cards so that the children themselves could think and utter the questions. *(2) How to develop the attitude of listening to people's opinions.* There were voices that many children were concentrating on talking in this game. To create an interaction, it is necessary to consider not only the utterance of oneself but also the utterance of others, so it is necessary to devise not only to express one's own opinion but also to listen to the opinion of another person. *(3) How to increase the chances of communicating my opinion (the basis of judgment).* There was an opinion that it would be possible to create a new conversation topic by providing a basis and sharing it when excluding the criminal in the game. Therefore, it will be necessary to provide opportunities for sharing information on the decisions made by children as much as possible.

REFERENCES

Uematsu Shigeo, Kasuya Kyoko, Uehara Akiko, Kitamura Naoki, Kinugasa Tomoko, Sato Reiko, Takahashi Miyuki, Yanagi Yoshikazu. “Relationship between proficiency level, starting grade and hours -Preliminary survey report for teachers-.” (2012): 138–146.

John M. Keller Translated by Katsuaki Suzuki. Shobo Kitaoji. “Design learning motivation.” (2010): 47.

Ministry of Education, Culture, Sports, Science and Technology. “Survey of English Education Implementation Status in Elementary School.” (2017).

New learning guidelines for elementary school (2019).

Fujihira Masatoshi. “Practical Report on Promotion of Interactional Activities by Digital/Analog Teaching Materials.” 2018.

Yoko Higashino. “Improving Japanese English Education from Elementary School English with Problem-Solving Classes: Proposals for Realizing “Independent, Interactive and Deep Learning” Aimed at the Next Guideline of Study Volume 3 Issue 1.” (2019): 99-108.

A Comparative Study of Instructional Interaction Behaviors between Expert Teachers and Novice Teachers in Smart classroom

Liu Huan
South China Normal University
lh-huan@foxmail.com
Master Student
Guangzhou,China

Key words: Smart Classroom, Instructional Interaction, Expert Teachers, Novice Teachers, Teacher Professional Development

ABSTRACT

The emergence of smart classrooms provides unlimited possibilities for teachers' "teaching" and students' "learning". As the organizer and implementer of classroom teaching, teachers' instructional behavior is one of the important components of classroom teaching, which affects the teaching effect to a certain extent. As the essential feature of classroom teaching, teacher-student interaction has always been the focus of classroom instructional interactive behavior to explore speech act and technical interaction behavior in smart classrooms. This study will use the classroom observation method from the perspective of teacher professional growth stage, based on One-to-One Technology-Based Interaction Analysis System, to compare and analyze the classroom teaching interaction between expert teachers and novice teachers. The research finds that the improvement of the "subjective" status of the expert teacher classroom students in the smart classroom, and compared with the novice teachers, expert teachers have the characteristics of "rich interactive, interactive efficient ".

REFERENCES

Hailing Bai (2013).A case study of teacher-student interaction behavior in interactive whiteboard environment (Master's thesis, Central China Normal University).(in Chinese)

Weidong Chen, Xindong Ye and Yafeng Xu (2012).Future classroom: intelligent learning environment.Distance education journal, 5, 42-49. (in Chinese)

Hou Han, Dongqing Wang and Chang Cao (2015).1.1 Analysis and research on interactive behavior of classroom teaching in digital environment.Audio-visual education research, 36(5), 89-95. (in Chinese)

Cui Kang and Meifeng Liu (2013).Qualitative research on teachers' teaching plans in different professional development stages.Audio-visual Education in China, (11), 66-73. (in Chinese)

Chongde Lin, Jiliang Shen and Tao Xin (2006).The composition of teachers' quality and its training approaches.Chinese Journal of Pedagogy. (in Chinese)

Ailing Qiao, Wang Lu, Yao Li, Yangchun Yin and Si Chen (2018).A study on the differences of teaching behaviors among different groups of teachers.Audio-visual education research, 39(4), 93-100. (in Chinese)

Qiuping Su (2009).Enlightenment of teacher's professional development stage theory on teacher education.Journal of Guangxi Institute of Education, (6), 46-49. (in Chinese)

Guangyong Xu and Fucheng Liu (2013).Research on classified management of improving teaching ability of young teachers in colleges and universities.Journal of Bengbu University, 2(6), 65-69. (in Chinese)

Yaping Yue (2011).Comparison of characteristics of preschool teachers' knowledge structure in different professional development stages.Pre-school education research, (9), 43-46. (in Chinese)

Berliner, D. C. (2001). Learning about and learning from expert teachers. International journal of educational research, 35(5), 463-482.

Livingston, C., & Borko, H. (1989). Expert-novice differences in teaching: A cognitive analysis and implications for teacher education. Journal of teacher education, 40(4), 36-42.

Qiong, L. I., & Yujing, N. I. (2009). Dialogue in the elementary school mathematics classroom: A comparative study between expert and novice teachers. Frontiers of Education in China, 4(4), 526-540.

Westerman, D. A. (1991). Expert and novice teacher decision making. Journal of teacher education, 42(4), 292-305.

Conflicts of New Members in an Overseas Development Project for Education in Cambodia

Nanae Tsuzuki
nw180417@n-fukushi.ac.jp
Undergraduate student
Nihon Fukushi University
Aichi, Japan

Miki Nakamura
nw180474@n-fukushi.ac.jp
Undergraduate student
Nihon Fukushi University
Aichi, Japan

Mahiro Mase
nw180599@n-fukushi.ac.jp
Undergraduate student
Nihon Fukushi University
Aichi, Japan

Key words: Overseas project, First participation, Conflict, Education

ABSTRACT

According to a survey by the Student Research Institute (STUDENTS LAB), the number of university students participating in overseas activities tends to decrease. Looking at the results of the questionnaire taken by about 450 university students, the number of students who have participated in overseas projects was about 5%. On the other hand, the awareness of overseas projects was about 70%. In spite of students' high recognition, the current situation is that there are few students who have participated in overseas projects. We would like to address anxiety and conflicts, which students sometimes have to join fieldwork (Murata, 2018). Therefore, in this research, we look back on our first overseas project. We also interview students who also participated in the overseas project for the first time and other ones who did so twice. By doing so, we will clarify what kind of conflicts actually occurred and propose how to deal with them.

In particular, we give an example of the anxiety and conflicts that occurred during the activity of the educational project conducted at the teacher training center in Cambodia, which was our first participation in overseas project, and suggested the points for its improvement. We participated in an activity called "Education Sustainable Assistant in Cambodia (E-sac)" conducted by upperclassmen. This is what we, students, played a role as a part of the project by the Japan Society for Educational Technology in 2017. It was a part of the overseas development project of Japanese-style education, in collaboration with the public-

private sector conducted by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) called “Edu-Port Japan.”

As a result of the survey, it became clear that when participating in the project, they worried about the content of the activity due to the lack of their English skills and the local environment such as educational facilities. Also, they worried if they could get along with other members. In order to reduce such anxiety and conflicts at the time of first participation, it is necessary to study frequently used expressions in English, read the past reports carefully, and share the experience with members who participated last time. Moreover, creating opportunities for communication in advance in some way and deepen relationships among participating members is needed. We hope that the anxiety and conflicts among those who participate in overseas projects for the first time will be reduced, and more students participate in overseas projects in the future.

REFERENCES

Murata, A. (2018). Promoting multicultural experiential learning in higher education (in Japanese), Nakanishiya Shuppan, Kyoto.

Research on the Influence of Peer Review on Online Learning cognitive engagement

Xu Zhijun
469249541@qq.com
Undergraduate Student
South China Normal University
China, Guangzhou

Key words: cognitive engagement□ peer review□ Online learning□ MOOC

ABSTRACT

With the deep integration of information technology and education, the new online learning mode represented by MOOC is developing vigorously , and how to ensure the quality of online learning has become the focus of scholars' attention. Online learning engagement is an important indicator of the quality of online learning and a prerequisite for deep learning, in which cognitive engagement reflects the level of mental effort that learners make in selecting and evaluating relevant information and resources, is the key to the quality of learning. The related research shows that the positive interaction behavior of members has a significant positive effect on learning engagement. To provide learners with an online learning environment that stimulates them to participate in interactive activities, effective social interaction can effectively improve learners' course completion rate and learning effect. Peer Evaluation, as an effective social interaction, has been widely introduced into MOOC, which plays an important role in enhancing interaction and knowledge sharing. Based on the course "theory, technology and practice of mobile learning" , this study focuses on the influence of MOOC learners' peer review attitude and competence on their online cognitive engagement, by using quantitative and qualitative methods such as questionnaire survey, Python data mining, text content analysis and interviews, this paper obtains the peer review attitude and platform interaction data of MOOC learners, analyzes the relationship between them, and puts forward suggestions for improvement, in order to promote the effective implementation of peer review in MOOC teaching, to provide reference for improving the quality of online learning.

REFERENCES

[1] A Study on Influencing Factors College Students'Learning Engagement in Online Learning Space. Guangxi Normal University□ 2019.

[2] Dixson M D. Creating effective student engagement in online courses: What do students find engaging?[J]. Journal of the Scholarship of Teaching and Learning, 2010: 1-13.

[3] FANG Jia-ming, TANG Lu-fen, MA Yuan-hong, HU Li-xue. The Effect of Social Interaction on Learning Engagement in MOOC. Modern Education Technology, 2018, 28 (12): 87-93.

[4] Ma Zhiqiang, Wang Xuejiao & Long Qinqin .A Literature Review of Online Peer Assessment. of Distance Education. 2014,32(04):86-92.

[5] KOP R,FOUMIER H,MAK S. F. J. A pedagogy of abundance or a pedagogy for human-beings：participant support on massive openonline courses[J].The international review of research in open and distance learning，2011，12(7)：74-93.

[6] PANADERO E，ROMERO M，STRIJBOS J W. The impact of a rubric and friendship on peer assessment：effects on constructvalidity，performance，and perceptions of fairness and comfort[J]. Studies in educational evaluation，2013，39（4）：195-203.

[7] Casimiro, L.T.(2016) . International Journal of Information and Education Technology . 16: 441-6

[8] Adar, B. E. , Debra, M. ,& Rena, D. , et al. (2018). Investigating the mul-tidimensionality of engagement: Affective, behavioral, and cognitiveengagement across science activities and contexts. Contemporary Edu-cational Psychology, 53(1):87-105.

Design of VR live broadcast interactive system Oriented k12 experimental teaching

Zhang Ke
2644992015@qq.com
Undergraduate
Southwest University
Chongqing, China

Tan Dandan
1575144589@qq.com
Undergraduate
Southwest University
Chongqing, China

Cheng Diqin
2020623595@qq.com
Undergraduate
Southwest University
Chongqing, China

Xie Tao
xietao@swu.edu.cn
Associate Professor
Southwest University
Chongqing, China

Key words: K12, Experimental course teaching, VR, Human-computer interaction

ABSTRACT

The new generation of information technology has promoted the rapid development of online education. Among them, virtual reality technology has played an inestimable role in the transformation of online education models (Merchant, Z. , Goetz, E. T. , Cifuentes, L. , Keeney-Kennicutt, W. , & Davis, T. J. 2014). VR can not only satisfy students' sense of experience and curiosity, but also impart knowledge and training skills to them, which have a positive impact on teaching mode, teaching effects and teaching innovation (Yu Weihong, Chen Chao 2012). In traditional online teaching in both primary and secondary schools, teachers are usually unable to bring the specific sensory stimulation to students through practical demonstrations, nor can students personally experiment to facilitate their understanding and memory to knowledge.

This project will design a VR-based live interactive system for k12 experimental teaching. Teachers and students in different places will be organized into a virtual learning environment to

complete the experimental process through independent exploration, collaboration, and social interaction, (Lozano, E. , Gracia, J. , Corcho, O. , Noble, R. A. , & Gómez-Pérez, Asunción. 2015), by which students can gain experimental operation skills and the improvement of metacognitive ability. Meanwhile, the problem of bad experiences of online experimental lessons will be addressed .

To this end, this study will select typical experiments in K12 education, and integrate multiple interactive methods to ensure learners' sensory experience such as vision and hearing (Lin Shengqing 2018). First of all, in terms of voice interaction, based on Alibaba Cloud' s voice recognition service, this study uses Unity' s MicroPhone class to record and saves it in the wav format, and then calls JAVA SDK according to Alibaba Cloud' s intelligent voice interaction specifications to recognize the saved voice files, then generates the result text. The system analyzes the learner's voice instruction via the result text to responds and executes the corresponding operation so that the voice interaction is realized. In terms of gesture interaction, a basic experimental scene is constructed in the Unity3D development environment, and then Leap Motion is used to obtain gesture data, and key points are extracted as feature vectors, and a long and short-term memory network model (LSTM) is used for gesture recognition. Through the preset experimental intervention and feedback mechanism, combined with the experimental log to control and feedback the student's experimental process, we can finally gain a VR experimental teaching system with strong compatibility, high feasibility and good experiences.

REFERENCES

Lozano, E. , Gracia, J. , Corcho, O. , Noble, R. A. , & Gómez-Pérez, Asunción. (2015). Problem-based learning supported by semantic techniques. Interactive Learning Environments, 23(1), 37-54.

Merchant, Z. , Goetz, E. T. , Cifuentes, L. , Keeney-Kennicutt, W. , & Davis, T. J. . (2014). Effectiveness of virtual reality-based instruction on students' learning outcomes in k-12 and higher education. Computers & Education.

林胜青. (2018). 基于vr的交互系统在高校实践教学中的应用探讨. 数字通信世界, No.160(04), 215+251.

余卫红, & 陈超. (2012). 虚拟现实技术在教育教学中的应用及思考. 软件导刊.教育技术, 000(008), 91-92.

Consideration of Learner-centered Activities in Online Learning Environment

Mayu Tsuruta
nw180425@n-fukushi.ac.jp
Undergraduate student
Nihon Fukushi University
Nagoya, Japan

Yui Sumiya
nw180326@n-fukushi.ac.jp
Undergraduate student
Nihon Fukushi University
Nagoya, Japan

Saki Shibayama
nw180276@n-fukushi.ac.jp
Undergraduate student
Nihon Fukushi University
Nagoya, Japan

Da-eun Kim
de1472581@gmail.com
Undergraduate student
Chonnam National University
Gwangju, Korea

Key words: E-learning, Online Learning, Learner-centered

ABSTRACT

Students were forced to start e-learning because of the COVID-19 pandemic. E-learning is a learning style that we can learn through networks using devices such as computers, tablets and smartphones. There are various kinds of education using current computer systems. This time, we focus on online-live classes. Recently, the concept of student-centered learning is considered to be more important than teacher-centered education (e.g., Shinto, 2000; Matsuyama, 2019). In student-centered learning, it is important to not only obtain knowledge that is already known, but also to learn from their experiences. In other words, it is a class which students can connect what they have learned in class with their own experiences and interests to acquire them. It can help learners improve their facilitation skills with developing cooperation and verbal communication skills among students.

In this study, we focus how our online classes affected student-centeredness. As a premise, we assume that online classes will be more essential in the future. The purpose of this study is to survey online-live classes that we experienced in our universities and language schools. The surveyed classes are

ones held in one university in japan, one university in Korean, and two language schools in Canada. We compared the results of these four different organizations.

We analyzed and investigated some more characteristics cases. In the questionnaire survey, many students answered that online classes were better because they could use their time meaningfully. However, there were also many people who said that face to face classes were better because it was difficult for them to speak out, and ask questions after the classes. In addition, when comparing Japan to Korea, the answers to whether the content of the online class is satisfactory, and whether they want to continue the online class after COVID-19 were the opposite. There was a clear difference between Japanese and Korea this time. One of the online classes at the university invited resources outside, taking advantage of online, and students took the initiative. On the other hand, the style of the language school classes was changed after the face to face classes were shifted into online classes. The classes filled with interactive discussions were lost, and the students only listened to the teachers most of the time. Some teachers said that they did not have ideas about online classes and preparation was not enough because the shift occurred suddenly and face-to-face classes were the mainstream so far.

From these results, it will be necessary to deepen the understanding of online class characteristics, and make mutual consideration in order to make online learning students centered.

REFERENCES

Matsuyama, T. (2019). A Study on Improving Classroom Teacing through Active learning (in Japanese), *Departmental Bulletin Paper of the Faculty of Child Development and Education, Toyama University of International Studies, 10*(2), 163-171.

Shinto, T. (2000). How to create learner-centered class in KJJ practice (in Japanese), *Kyoto University's library of higher education research, 7*, 17-29.

How Do Teachers Evaluate Cross-Curriculum Learning in Subject teaching?

Hiyori TOJO
18p1231@stu.meisei-u.ac.jp
Meisei University
Tokyo Japan

Masato TOYODA
18p1239@stu.meisei-u.ac.jp
Meisei University
Tokyo Japan

Takeshi HASIMOTO
18p1264@stu.meisei-u.ac.jp
Meisei University
Tokyo Japan

Takayuki KONNO
konno@t-konno.net
Meisei University
Tokyo Japan

Key words: Cross-curriculum learning, Evaluation criteria, Elementary school

RESEARCH OBJECTIVE

The purpose of the present study was to clarify how do teachers evaluate cross-curriculum learning in subject teaching.

RESEARCH METHODOLOGY

In this study, the authors interviewed the teacher in elementary school who had experiences to evaluate cross-curriculum learning and has made research presentations on those practical studies. The authors had about 2-hour interviews through ZOOM with the teacher in June 2020.

Interview results were recorded and transcribed as the data. The data were in using the KJ method(Kawakita,1967). That is, we assembled and analyzed the information from a variety of angles. The data set produced by the interview was analyzed in four phases.

FINDING AND DISCUSSION

As a result of the analysis, the following three points were determined in the evaluate cross-curriculum learning.

(1)The teacher had created evaluation criteria and the problem-solving learning by the students themselves that based on the corresponding grades and subjects.

(2)The teacher was not only studying content in the subject and unit but also designing lessons beyond the boundaries of grade and subject and not evaluating only through paper tests.

(3)The students recorded self-evaluation and portfolio based on the evaluation criteria set before the learning activity.

CONCLUSION AND FUTURE DIRECTION

The purpose of the present study was to clarify how do teachers evaluate cross-curriculum learning in subject teaching. As a result of the analysis, the two points were determined in the evaluate cross-curriculum learning.

However, it was not possible to clarify what kind of evaluation criteria was created from the viewpoint of the corresponding grades and subjects, and how it should be prepared. Therefore, in order to develop the study and to make it easier for other teachers to introduce cross-curriculum learning, it is necessary to study further. Although in this study focused on the teacher with rich educational experience, the implementation of a concrete factor for evaluation criteria is not clear.

REFERENCES

Nakata,Y. (2018). Development of cross-disciplinary unit to develop problem-seeking skills,*2017 abstract of the practical research report of the Department of Advanced Teaching Practice*, Graduate School of Education, Shinshu University. pp.57-60

Inagaki,T. (2017). Design and practice of project learning using tablet terminals, *research on educational media*, 23(2): 69-81.

Yamada,A. and Tsuzuki,S. (2015). Consciousness of regular elementary school teachers in elementary school for general instruction, *Education for the Disabled and Welfare Studies* Vol. 11:79-88.

Yamada,A. and Tsuzuki,S. (2014). Issues of Practical Research of Synthetic Teaching from the Perspective of Education and Science, *Collection of subject development studies*, 2:199-209.

Yoshizaki,S. (1984). Examination of lesson composition factors that affect teacher's unit composition, *Educational Psychology Research*, 32(3):223-224.

Kawakita,J.(1967) Idea method-for creativity development, *Chuokoron-shinsha public company, Tokyo, Japan.*

The Proposal for Participatory Safety Program

Yeojin Oh
ohyeojin0@gmail.com
Graduate student
Hanyang University
Seoul, Republic of Korea

Juyeong Yeom
yeomjuyeong0@gmail.com
Graduate student
Hanyang University
Seoul, Republic of Korea

Jiyeon Jung
zziyeons@gmail.com
Graduate student
Hanyang University
Seoul, Republic of Korea

Milee Ahn
mlahn@hanyang.ac.kr
Professor
Hanyang University
Seoul, Republic of Korea

Key words: participatory program, community mapping, safety program, agricultural working environment

ABSTRACT

The purpose of this study is to propose the participatory safety program in the agricultural industry by applying the 'community mapping' method. Safety accidents in the agricultural industry include accidents not only caused by personal carelessness but also caused by the working environment(Rural Development Administration, 2018). The process of identifying the risk factors present in the agricultural working environment is important in that the risk factors existing in the safety blind spot can be dealt with in advance and prevent potential disasters (Kwon, Lee, Shin & Park, 2020). At this time, community mapping can be used as an effective method to figure out the hazards in a specific environment and share information about them.

Community mapping is a map developed collaboratively by the residents of the particular area, highlighting the area's regional features(Parker, 2006). To propose the safety program, the case study of two Korean community mapping projects and each of United Kingdom, Japan, and Kenya's community mapping projects were conducted.

Based on the case study, the participatory safety program proposed in the form of community mapping called ‘town safety map’ that can be used in the agricultural working environment. Residents will get involved in the process of completing the safety map by registering accident cases or hazards in their agricultural working environment via the website of the ‘town safety map’. Including the collective factors of the former case study, the ‘town safety map’ enables to deal with the submitted reports rapidly by working with the related institutions.

REFERENCES

Kwon, J., Lee, H., Shin, E., Park, S., (2020). The Effect of Community Mapping Application Development and Application on the Safety Consciousness of Elementary and Middle Schools. Journal of The Korean Society of Disaster Information, 15(3), 322-338.

Ministry of Employment and Labor (2018). Analysis of Industrial Disaster Status.

Parker, B. (2006). Constructing community through maps? power and praxis in community mapping. The Professional Geographer, 58(4), 470-484.

Rural Development Administration (2018). Agricultural Safety and Health.

The study of facilitator's body language which works to develop a learning community on online student-led activity in higher education

Keiju Suzuki
dj3re56@gmail.com
Undergraduate student
Meiji University
Chiba, JAPAN

Shun Yasuda
shunilovebaseball@gmail.com
Undergraduate student
Meiji University
Chiba, JAPAN

Ryo Harada
ryokenryo0814@gmail.com
Undergraduate student
Meiji University
Nagano, JAPAN

Yosuke Yamamoto
yamaland.hecate2@gmail.com
Undergraduate student
Meiji University
Kanagawa, JAPAN

Key words: Online facilitation, Body language, Student-led activity, Learning community

RESEARCH BACKGROUNDS AND OBJECTIVE

In this research, the authors will clarify how facilitators' body language promotes conversations of participants in online activities.

Since COVID-19 spread in Tokyo, the authors started conducting online activities such as online social gathering and online talk activities. It was a new experience for the authors and other students to have different kinds of online activity. However, it was not easy to have a conversation compared to the face-to-face activity. The authors found the importance of facilitators in such online activities.

During the activities, the students took the role of facilitators. Since taking the role of facilitators, the authors found that online facilitation is different from that in face-to-face situation. For example, Song (2013) claims that it is essential to make a bright environment so that each participant talks with equal status from a spatial design perspective. However, an online conversation does not have such an environment because the participants join from different places.

Therefore, the authors will clarify how facilitators' body language in online activities promotes participants' conversations as online facilitation skill. The authors analyze two online activities named "Online Morning Cafe" and "Online GJS Social Gathering" conducted as a part of the authors' projects.

OUTLINE OF THE PRACTICE

"Online Morning Cafe" and "Online GJS Social Gathering" were online activities conducted by students of Global Japanese Studies, Meiji University. The first activity is about an online talk session, where the students meet with guest speakers from Kyoto, Osaka, and Miyagi. Since it is a part of career education for undergraduate students, it was essential to have conversations between guest speakers and students rather than merely listen to the guest speakers. The second one is also an online talk activity which supported first-year students who hadn't had any experiences on the university campus and with their friends there. About 100 freshmen joined it since many of them wanted to meet their mates and seniors on the Internet.

At first, the role of the facilitator was important because the students were unfamiliar to such online activities. They hadn't understood deeply how to have conversation with others in such a situation, which caused the problem that they feel it too difficult to say something there. Therefore, the facilitator was required to help them feel secure and relaxing enough to share their thoughts.

However, it was also difficult for the facilitators to help them in such a situation. This is because the facilitator wasn't also familiar with the online activities. Therefore, the authors, who created and conducted the activities, had a reflection meeting after every activity and discussed what factors are important for the online facilitation.

In the reflections, they discussed that the facilitator could utilize the "Chat" in Zoom more positively. By using "Chat", he/she can share their thoughts and questions by typing. This function visualizes conversation, making it easier for the students to understand and join the conversation (Iwasaki, 2019). Actually, the authors tried using "Chat" to visualize the conversation and support the students. In addition, the authors also said to them that they can freely use "Chat" to share their thoughts and questions. This is because the authors imagined that the students who cannot say something in the activities could join the conversation by typing.

However, it turned out to be that the more essential point should be discussed. This is because, even though "Chat" was introduced, there were still some situations that quite a few students talk in the activities. In the next reflection, the authors remembered that some students once claimed they feel worried and difficult to say their opinions because of the "no reaction". They told us that they cannot see the reactions from others so well that they're afraid of the others who may disagree with or don't understand them. From their opinions, the authors started to think that it can be essential to look carefully at "reaction".

In the reflection, the authors presumed that the facilitator needs to show their body languages more clearly than that in the normal face-to-face situation. This is because it's comparatively difficult to tell their reaction in the online situation. People generally share not only verbal language but also body languages such as nod and gesture in their communication (Watanabe, 2003). In addition, they can change their communication style by looking the reactions from others (Ishikawa, 2017). However, since the screen size is limited in the online situation, people can be looked as if they don't show any reactions. The authors imagined that such problem leads the students to think it's difficult to have conversation in online activities. Therefore, the authors also thought that it could be essential to have clearer reaction.

Throughout this process, the authors tried to facilitate the activities by focusing on the body language and could get some positive results. Therefore, for this time, the authors decided to research it more deeply and reveal how facilitators' body languages influence on the participants and accelerate their conversations in online activities.

RESEARCH METHODS AND RESULTS

The authors employed semi-structured interviews with the facilitators and the participants who joined Online GJS Social Gathering or Online Morning Cafe.

The semi-structured interview (Flick, 2002) with the facilitators includes the following three questions, (1) Were you aware of making body language that facilitates your activity? (2) During facilitation, did you receive any impressive body languages from the participants? and (3) Did you pay attention to other points except for body language in order to promote the conversations of participants? Furthermore, the semi-structured interview with participants includes the following two questions; (1) How do you feel when the facilitator use body language? and (2) Are there any body languages of facilitator that makes you feel better in conversation?

The collected data was inscribed into transcript, coded, and categorized based on the KJ method. As a result of the analysis, the authors clarify that (1) facilitators intentionally use body language during online conversation since the social cues in the video conference are limited, (2) Body language makes participants feel comfortable and secure in giving their opinions.

REFERENCES

Flick,U (2002) *An Introduction to Qualitative Research.* SAGE Publications

Ishikawa,N (2017) Facilitating the Cooperation between Universities and Regions: Introduction of Meta Facilitation in the Taoyaka Program at Hiroshima University. *Bulletin of the Hiroshima University Museum*, 9, pp.69-80

Iwasaki,H. (2019) Construction of Dialogue Environment in Telecollaboration: Practice of Japanese Dialogue in Web Meeting System. *The Study of e-learning Education*, 13, pp.29-41

Song,D. (2013) Facilitator of Dialogue-Based Communication and Reflective Practice. *Japan Primary Care Assosiation*, 36□ 2□ , pp.124-126

A case study on the influence of peer assessment on online emotional engagement of MOOC learners

Lan Yan
872755412@qq.com
Master student
South China Normal University
Guangzhou, China

Key words: Online learning, MOOC, Peer assessment, Emotional engagement, Text sentiment analysis

ABSTRACT

At present, Massive Open Online Courses (MOOC) are one of the most popular online learning ways both at home and abroad. This new learning way, which is completely different from traditional education services, not only enables the majority of online learners to learn new knowledge and acquire new skills conveniently and quickly, but also reduces the learning costs of learners. However, despite the advantages that traditional education services cannot achieve, MOOC still faces the problems of high learner dropout rate and low course completion rate, which largely hinders the long-term development of MOOC. Peer assessment has a positive impact on the emotional engagement of MOOC learners, thereby increasing the completion rate of MOOC courses. Therefore, it is very necessary to study how to improve the emotional engagement of MOOC learners through peer assessment and improve the MOOC learning effect. In addition, there are relatively few studies exploring the mechanism of peer assessment on the emotional engagement of MOOC learners at this stage, and there is no research to verify the effect of peer assessment on online emotional engagement of MOOC learners.

This research is based on student engagement theory, self-determination theory, and cooperative learning theory, using case study methods, and selecting students who participated in the "Mobile Learning Theory, Technology and Practice" course on the MOOC platform of Chinese universities as the research objects. Questionnaires were conducted among 280 MOOC learners . The research uses big data to mine the text data in the discussion forum and online text sentiment analysis technology to deeply study the emotional state of 44 learners, and uses the statistical analysis methods such as correlation analysis and regression to analyze the impact of peer assessment's attitude and sense of ability on emotional engagement. The results of the study show that the attitudes and abilities of peer assessment have a significant effect on MOOC's emotional engagement. Based on this, this research gives suggestions for improving the attitudes and abilities of peer assessment to promote online emotional engagement of MOOC learners. And construct a model of the influence mechanism of peer assessment on MOOC learners' emotional engagement.

This research deeply analyzes the specific impact of peer assessment on online emotional engagement in the MOOC environment. The research results can not only deepen the understanding of peer assessment in the online learning environment, but also help managers and developers of online learning platforms The personnel formulate targeted management plans and product development strategies that are conducive to the promotion of learners' emotional engagement, so as to effectively increase the completion rate of the course, thereby improving the MOOC learning effect.

REFERENCES

Alyuz, N. , Okur, E. , Oktay, E. , Genc, U. , & Arslan, A. . (2016). Towards an emotional engagement model: Can affective states of a learner be automatically detected in a 1:1 learning scenario?. 24th ACM Conference on User Modeling, Adaptation and Personalization (UMAP). ACM.

Alzoubi, O. , D'Mello, S. K. , & Calvo, R. A. . (2012). Detecting naturalistic expressions of nonbasic affect using physiological signals. IEEE Transactions on Affective Computing, 3(3), 298-310.

Astin, A. W. . (1984). Student involvement: a developmental theory for higher education. Journal of College Student Development, 40(5), 297-308.

Chen, K. C. , & Jang, S. J. . (2010). Motivation in online learning: testing a model of self-determination theory. Computers in Human Behavior, 26(4), 741-752.

Chen, Y., & Tsai, C. (2009). An educational research course facilitated by online peer assessment. Innovations in Education and Teaching International, 46(1), 105-117.

Cheng, K., Liang, J., & Tsai, C. (2015). Examining the role of feedback messages in undergraduate students' writing performance during an online peer assessment activity. Internet and Higher Education,, 78-84.

Cole, Michael (Ed), JohnSteiner, Vera (Ed), Scribner, Sylvia (Ed), & Souberman, Ellen (Ed). (1978). Mind in society: the development of higher psychological processes. Psychological Processes, 7740(1), 774027-774027-11.

Connell, J. P. , & Wellborn, J. G. . (1991). Competence, autonomy, and relatedness: a motivational analysis of self-system processes. Journal of Personality and Social Psychology, 65.

Darwin, Charles. (1934). The Expression of the Emotions in Man and Animals (3rd ed.). The expression of the emotions in man and animals. Watts & Co. .

Fedynich, L. V. , Bradley, K. S. , & Bradley, J. . (2015). Graduate students' perceptions of online learning. Research in Higher Education Journal, 27.

Fredricks, J. A. , & Paris, B. A. H. . (2004). School engagement: potential of the concept, state of the evidence. Review of Educational Research, 74(1), 59-109.

Hou, H., Chang, K., & Sung, Y. (2007). An Analysis of Peer Assessment Online Discussions within a Course that uses Project-based Learning. Interactive Learning Environments, 15(3), 237-251.

Ilya M. Goldin. (2012). Accounting for peer reviewer bias with bayesian models.

Izard, C. E. (2007). Basic Emotions, Natural Kinds, Emotion Schemas, and a New Paradigm:. Perspectives on Psychological Science, 2(3), 260-280.

Joksimovic, S. , Gasevic, D. , Loughin, T. M. , Kovanovic, V. , & Hatala, M. . (2015). Learning at distance: effects of interaction traces on academic achievement. Computers & Education, 87(SEP.), 204-217.

K., & Mangelsdorf. (1992). Peer reviews in the esl composition classroom: what do the students think?. Elt Journal.

Kearney, S. (2013). Improving engagement: the use of 'Authentic self-and peer-assessment for learning' to enhance the student learning experience. Assessment & Evaluation in Higher Education, 38(7), 875-891.

Lek H H , Poo D C . Sentix: An Aspect and Domain Sensitive Sentiment Lexicon[C]// IEEE International Conference on Tools with Artificial Intelligence. IEEE Computer Society, 2012.

Lin, S. S. J. , Liu, E. Z. F. , & Yuan, S. M. . (2010). Web-based peer assessment: feedback for students with various thinking-styles. Journal of Computer Assisted Learning, 17(4), 420-432.

Liu, Z. F. , Lin, S. S. J. , Chiu, C. H. , Member, & IEEE. (2001). Web-based peer review: the learner as both adapter and reviewer. IEEE Transactions on Education.

Lydia Wen, M. , Tsai, Chin‐Chung, & Chang, Chun‐Yen. (2006). Attitudes towards peer assessment: a comparison of the perspectives of pre‐service and in‐service teachers. Innovations in Education & Teaching International, 43(1), 83-92.

M.D. Dixson. (2010). Creating effective student engagement in online courses: what do students find engaging?. Journal of Scholarship of Teaching & Learning, 10(2), 1-13.

Ming-Te, Wang, Angela, Chow, Tara, & Hofkens, et al. (2015). The trajectories of student emotional engagement and school burnout with academic and psychological development: findings from finnish adolescents. Learning & Instruction.

Munezero, M., Montero, C. S., Mozgovoy, M., & Sutinen, E. (2013). Exploiting sentiment analysis to track emotions in students' learning diaries. koli calling international conference on computing education research.

Nelson, M. M., & Schunn, C. D. (2009). The nature of feedback: how different types of peer feedback affect writing performance. Instructional Science, 37(4), 375-401.
Newmann, Fred M., Ed. (1992). Student engagement and achievement in american secondary schools.
Nystrand M A . (1990). Student engagement: when recitation becomes conversation.
Paltoglou, G. , & Thelwall, M. . (2012). Twitter, myspace, digg: unsupervised sentiment analysis in social media. Acm Transactions on Intelligent Systems & Technology, 3(4), 1-19.
Patrick, B. C. , Skinner, E. A. , & Connell, J. P. . (1993). What motivates children's behavior and emotion? joint effects of perceived control and autonomy in the academic domain. Journal of Personality & Social Psychology, 65(4), 781-91.
Pilotti, Maura. (2017). Factors related to cognitive, emotional, and behavioral engagement in the online asynchronous classroom. International Journal of Teaching & Learning in Higher Education, 29.
Prins, F. J. , Sluijsmans, D. M. A. , Kirschner, P. A. , & Strijbos, Jan‐Willem. (0). Formative peer assessment in a cscl environment: a case study. Assessment & Evaluation in Higher Education.
Rosa. (2016). An Analysis of the Autonomous Learning Model of Foreign Languages in the Mooc Environment. Modern Education Technology, 26(001), 87-93.
Ryan, Richard, M. , Deci, & Edward, L. . (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist.
Siow, L. F. (2015). Students' Perceptions on Self- and Peer-Assessment in Enhancing Learning Experience.. Malaysian Online Journal of Educational Sciences, 3(2), 21-35.
Sluijsmans, *. D. M. A. , Brand-Gruwel, S. , Van Merri?Nboer, J. J. G. , & Martens, R. L. . (2004). Training teachers in peer-assessment skills: effects on performance and perceptions. Innovations in Education & Teaching International, 41(1), 59-78.
Staubitz, T., Petrick, D., Bauer, M., Renz, J., & Meinel, C. (2016). Improving the Peer Assessment Experience on MOOC Platforms. learning at scale.
Stephanie, A. *. , Mehta, S. , & Sellnow, T. . (2005). Measurement and analysis of student engagement in university classes where varying levels of pbl methods of instruction are in use. Higher Education Research and Development, 24(1), 40005-40016.
Stone, P. J., Dunphy, D., & Smith, M. S. (1967). The General Inquirer : a computer approach to content analysis. American Educational Research Journal, 4(4).
Strijbos, J. W. , Narciss, S. , & Katrin Dünnebier. (2010). Peer feedback content and sender's competence level in academic writing revision tasks: are they critical for feedback perceptions and efficiency?. Learning & Instruction, 20(4), 291-303.
Topping, K. . (1998). Peer assessment between students in colleges and universities. Review of Educational Research, 68(3), 249-276.
Trautmann, N. M., Carlsen, W. S., Eick, C. J., Gardner, F. E., Kenyon, L., Moscovici, H., ... & West, S. (2003). Online Peer Review: Learning Science as It's Practiced.. The journal of college science teaching, 32(7).
Tsai, C. C. , Lin, S. S. J. , & Yuan, S. M. . (2002). Developing science activities through a networked peer assessment system. Computers & Education, 38(1-3), 241-252.
Tseng, S. C. , & Tsai, C. C. . (2007). On-line peer assessment and the role of the peer feedback: a study of high school computer course. Computers & Education, 49(4), 1161-1174.
Veletsianos, G. , Collier, A. , & Schneider, E. . (2015). Digging deeper into learners' experiences in moocs: participation in social networks outside of moocs, notetaking and contexts surrounding content consumption. British Journal of Educational Technology, 46(3), 570-587.
Vogelsang, T., & Ruppertz, L. (2015). On the validity of peer grading and a cloud teaching assistant system. learning analytics and knowledge.
Walji, S. , Deacon, A. , Small, J. , & Czerniewicz, L. . (0). Learning through engagement: moocs as an emergent form of provision. Distance Education.

e-Learning for Educational Equality: Focusing on Poverty

Fuyuki Nakamaru
nw180466@n-fukushi.ac.jp
Undergraduate student
Nihon Fukushi University
Aichi, Japan

Yewon Lee
leunoian1864@gmail.com
Undergraduate student
Chonnam National University
Gwangju, Republic of Korea

E-learning has been actively introduced into schools and companies due to the influence of the new coronavirus. As stated in the previous study, "By incorporating e-learning into education, learners' motivation to study will increase" (Kobayashi et al. 2004), it is expected to improve their motivation and achievement in education. In addition, the use of these facilities for the poor is progressing because they do not have to choose any place or time. However, using e-learning requires ownership of electronic devices, improvement of the Internet environment, and people or applications that provide e-learning. Those who cannot prepare for this cannot use E-learning. In the case of Japan, e-learning is being used in the education of foreigners, but three conditions have not been met and they have been left out of education. The Japanese government has not raised any issues with this issue. In the Philippines, 20% of the students have not graduated since they entered the school. Especially in rural areas, there is no educational support for those who have left school. As a result, new poverty begins again due to poor income due to poor employment. In South Korea, there is a huge gap in education. In particular, only those who earn a lot of money receive a good education, and those who earn a lot of money have lower grades than those who earn a lot of money. In this case, too, there is a situation where poverty continues to go around without ending because it is linked to future jobs. Governments representing the nation are turning a blind eye to the disparity in education created by poverty. As long as this is the case, the disparity in education created from poverty cannot be eliminated.

Keywords: E-learning, Educational Equality, Poverty

INTRODUCTION

According to UNICEF, there are 330 million people in the world without formal education. The main reasons are, “I used to go to school, but I left school halfway due to financial problems and the care of my brothers,” “I don't go to school now, but I may go to school in the future,” and “I don't have the possibility of going to school for the rest of my life.” The concept of e-learning, as defined as interactive learning without time and space, is free to participate in any situation, regardless of time and place. However, there are several conditions for receiving e-learning. And those who cannot meet those conditions cannot participate. Many of them suffer from poverty, and more than 300 million people who cannot attend schools are also suffering from poverty.

Therefore, if e-learning is introduced, support for those who do not meet the requirements will be necessary. However, much of this support is hidden or uncovered. We will focus on this part and explain it in three countries.

RESEARCH DESIGN & METHODS

We collected information mainly through the use of the Internet, reference materials, and participation in lectures. After collecting data in this way, we exchanged opinions by using SNS LINE because we live in different countries.

RESULT AND DISCUSSION

In Japan, out of 120,000 school-age foreign children (6-15 years old) on resident cards, approximately 20,000 have not received formal education or have not been confirmed (MEXT, 2020). The main reasons are, “I don't have enough income to go to school,” “I can't understand the language,” and “I take care of my brothers.” So, we wondered if e-learning could be used for children who are away from equal education. E-learning is available anywhere and anytime, so we can use our time efficiently. Also, education can be conducted according to the individual level. However, in order to receive e-learning, it is necessary to possess electronic devices, enhance the Internet environment, and have people or applications that provide e-learning. In one Japanese language class that adopted E-learning due to the influence of COVID-19, there are children who cannot take online classes because the internet environment is bad. In addition, some foreign students whose classes at school have been turned into online are unable to take classes due to unstable internet access.

Under these circumstances, the Japanese government published “Enhancement of Education for Foreign Students” in March this year. Due to the influence of the new coronavirus infection, the Japanese government is proposing Japanese language education through e-learning, but not all the conditions are met from the beginning. In fact, there are many children who are unable to participate in Japanese language classes because of the unstable internet environment and lack of electronic equipment. However, this issue is not mentioned in the Japanese government’s proposal (Japanese class in Tokai city). It is good to adopt a new policy, but I think we should also focus on people who will be left out of it. Schools, local governments and the government should tackle this problem more.

In the Philippines, 40 percent of students cannot graduate and 10 percent of students leave school even after entering the school (Interviewee: Shinya Sawamura). The main reasons are “insufficient income to go to school,” “no longer interest in learning,” and “get married.” “I’m getting married.” (Philippine Statistics Authority, 2013) “Education has to do with earnings, and people with lower educational

backgrounds have lower incomes (Ryoshin & Huanzhen, 2003).” As it says, “Children's academic ability tends to decline if their parents are on a low income (Koo In-hoe et al., 2015),” the rate of leaving school is higher in rural areas with low incomes and grades. Leaving these children alone will create a similar pattern of poverty in the future. Therefore, from the perspective of “incorporating e-learning into education will increase learners' motivation to study (Kobayashi et al., 2004),” we proposed the introduction of e-learning in order to improve the motivation to study and to consolidate education for children who have dropped out of school and whose motivation to study has declined.

However, the spread of electronic devices in the Philippines and the improvement of the Internet environment make it difficult for everyone to keep up with the gap in poverty. You can imagine that even if you distribute it, you sell it and turn it into money, which does not go the way you want it to go. Therefore, even though it is difficult to distribute one to an individual, it is necessary to adopt the local introduction method, such as installing one electronic device in a community center or park where everyone gathers.

In Korea, inequality in education is deepening due to polarization. The most representative polarization problems are socio-economic polarization and urban and rural polarization. The polarization of education due to income polarization contributes to creating a hierarchical society that inherits poverty. This phenomenon occurs as the ladder of class rise disappears as wealth is concentrated on very few people and the rest of the population continues to be dumbed down, the biggest cause of the educational gap. The fundamental problem of educational inequality in Korea lies in the huge private education market. The excessive burden of private education costs and the frustration of believing that one cannot cross classes alone in life amplifies the difference in results. Rich children who grew up enjoying private education benefits either go to higher educational backgrounds or prestigious schools and take a social advantage, thereby entrenching the class gap. So is the polarization of urban and rural areas. In modern society, regions have more meaning than just physical space. In modern Korean history, the areas of urban and rural areas are the most sharply reflected areas where inequality in real estate, financial assets, housing types, health care, culture, education, and services is organized and structured. Income, assets, and employment opportunities are concentrated in urban areas and are rich in social and cultural capital based on them. On the other hand, rural areas are vulnerable to income, assets, and social and cultural capital. In this reality, economic efficiency is expected in urban areas, so continuous economic investment is made by the state or the private sector, but investment in underdeveloped rural areas is less efficient. Thus, in socio-economic terms, living conditions in rural areas are bound to deteriorate. The same is true of educational conditions. In Korean society, where education is regarded as a tool for advancement, parents' desire to send their children to good schools is bound to seek unlimited competition, thereby expanding the private education market around the city. As such, education in urban areas will improve overall with continued investment by the state and private sectors, but rural areas will inevitably deteriorate as they have to rely solely on state investment.

Through our research, we realized that the introduction of e-learning and poverty are related. We also noticed that there were many problems to be solved before attempting a new challenge of e-learning. The reason why we have taken up these three countries is that they are close to us and have different problems with education. But strangely enough, all three have the same fundamental problems: education is equal for everyone, education accumulation leads to the future, and e-learning helps. However, many major educational institutions are hiding the current state of equal education. As a result, the lives of the few hidden people are getting poorer and poorer and poorer. We felt that this led to a widening disparity in poverty. The country's representative organization should be able to fight head-on without turning a blind eye to the issue.

REFERENCES

Akahori, K., Oure, H., & Ri, Kai. (2007) *Effectiveness of mobile devices for language learning*

Sasaki, K. (2011) Quality issues in elementary and secondary education in Quezon City, the Philippines, *Bulletin* of *Osaka University of Commerce, 6*(3), 71-80.

Yoshida, M. (2002) An Action Research to Contribute Philippines' Education with Information Technology, *Journal of Multimedia Education Research, 8*, 89-102.

Ryoushin, M. & Huanzhen. L (2003) Return to and Demand for Education in Rural China: A Case Study of Zhejiang Province

Lee S., Jang S., & Jang H. (2012) e-Learning: The factors that affect the learner's achievement in learning.

Kim Y. & Son J. (2011) A Study on the Design of Elementary and secondary e-Learning System for the Utilization of Smartphones. *Journal of the Internet Information Society.*

Japan International Trainee & Skilled Worker Cooperation Organization (2019) https://www.jitco.or.jp/

MEXT (2020) *Support for foreign children to enter school (Gaikoku jin no kodomo ni taisuru syuugaku shien nit suite* in Japanese)
https://www.mext.go.jp/b_menu/shingi/chousa/shotou/042/houkoku/08070301/004.htm

UNICEF (2018) *A future stolen: young and out-of-school*
https://www.unicef.or.jp/news/2018/0155.html

Torcida (2015) *Handbook for local Japanese language classroom: Connect and broaden (Chiki Nihongo kyoushitsu handbook: Tsunageru Hirogaru* (in Japanese)
https://www.pref.aichi.jp/uploaded/attachment/288749.pdf

Philippine Statistics Authority (2013) *Functional Literacy, Education and Mass Media Survey*
https://psa.gov.ph/sites/default/files/2013%20FLEMMS%20Final%20Report.pdf

Student's affective and skill learning outcomes in mind mapping-based instruction: A literature review

Yang Huiyun

hyyang@mails.ccnu.edu.cn
Master Course Student
Central China Normal University
China

Key words: Mind mapping; Mind mapping-based instruction; Affective learning outcomes; Skill learning outcomes

ABSTRACT

Mind mapping was originally introduced as a powerful learning technology. As a visualization tool, mind mapping is regarded as an instructional tool, which can be used by learners to generate ideas, take notes, organize thinking, and develop concepts. Mind mapping can not only represent a central theme and its connections but also support the identification of creative associations between ideas. Mind mapping is a note-taking technique that allows individuals to organize facts and thoughts into a form of a map, including the central image, the main themes radiated by the central image, the branches with key images and keywords, and the branches forming the structure of connecting nodes. Compared with the traditional linear note-taking method, mind mapping focuses on essential keywords and make the associations between them clearer. The radial structure also follows the reasoning of the brain, reflecting the infinite associative nature of the human brain. With the rapid popularization of mind mapping in school teaching, there is a need to conduct a systematic literature review on mind mapping-based instruction studies. Before this study, some scholars have studied and analysed the effectiveness of mind mapping-based instruction on cognitive learning, and the results showed that the mind mapping-based instruction can significantly improve the cognitive outcomes of students. This paper first gives an overview of the mind mapping-based instruction, and then the Education Resources Information Centre, Elsevier Science Direct online, Web of Science, EBSCO, ProQuest, Taylor & Francis Online, and Springer Link were selected as sources of data. Taking nearly 20 years as the time span, this paper makes a comprehensive search on the public literature from 2000 to 2019. Key concepts and search terms were developed. The specific search phrases utilized in this study were as follows: "mind map" OR "mind mapping". This paper focuses on the comprehensive analysis of the related research from the two aspects of students' affective

learning outcomes and skill learning outcomes. Discussion and conclusion are also provided in this paper.

Language Education for the Increase of International Students: In Case of one University in Japan and Korea

Yuki Shirotsuka
nw180284@n-fukushi.ac.jp
Undergraduate student
Nihon Fukushi University
Aichi, Japan

Koki Kodama
nw180235@n-fukushi.ac.jp
Undergraduate student
Nihon Fukushi University
Aichi, Japan

Itsuki Miyata
nw180656@n-fukushi.ac.jp
Undergraduate student
Nihon Fukushi University
Aichi, Japan

Key words: Second Language Education, International Student, Standard, Learning Environment

ABSTRACT

Recently, in Japan, international students have been increasing and regarded as new human resources which can alleviate declining workforce. However, second language education for international students has a problem. Okamoto (2005) mentioned, since 1990, with rapid change of social circumstances, the target in Japanese language education has been widened to various age groups, and learners' background and their needs are diverse. For this reason, the aim of this paper is to find a problem from current second language education and to give suggestions for its improvement. With this survey, we did literature and interview research. The subjects were Japanese language teachers, international students, and students with little involvement in Japanese language education.

As a result, two problems were found. First one is that the learning environment for international students is not common. The teaching method in Japanese language education has varied depending on the teachers' discretion, and there have been ability gaps between schools. Second is the opportunity to interact with native speakers of Japanese. It turns out that many universities have few opportunities for international students to interact with native speakers of Japanese. In particular, international students were often collected in a special course. Very little interaction with native speakers of Japanese could be an issue.

Improving second language education will require the creation of “standards” to maintain a learning environment beyond certain quality, and the clarification of teacher qualifications. It is important to eliminate teaching methods that depend on teachers by creating a “standard” that compensates for certain learning outcomes. In addition, to add the exchange opportunity with native speakers of Japanese to the “standards” and create situations that they must use Japanese. By this method, it can lead them to better elements such as the ones of project-based learning (PBL). Also, teachers are required qualities for supporting international students. Example of Germany, in accordance with “Agreement on Standards for Teacher Education (MEXT, 2004),” teachers required to “Understand the responsibilities and obligations associated with teaching.” Miyazaki (2012) also said, “Now, focused on comprehensive innovation that related in school education for teacher training, that teachers can become able to provide educational guidance, and support for children’s understanding not only subject’s expertise.” It is important to consider cultural understanding for international students as well.

For future language education, in addition to the issues mentioned in previous studies, it is essential to consider methods for creating “standards” and improving/keeping motivation for learning.

REFERENCES

Miyazaki, H. (2012). *Henkaku ki niaru Europe no kyouin yousei to kyouiku jissyu (in Japanese) (Teacher training and teaching practice of Europe in a dramatic change)*, Toyokan Shuppan, Tokyo.

Okamoto, S. (2005). Curent Issues in Japanese as a Second or Foreign Language Training (in Japanese), *Bulletin of Hokkaido Bunkyo University, 6*, 121-135.

MEXT (2004). Syogaikoku no kyouiku shisaku ni kansuru bunken chosa houkokusyo (in Japanese) (Report on education policy in other countries)

Factors that hinder students' active participation for online classes

Sato Daisuke
aydraydr2005@gmail.com
Undergraduate student
Meiji University
Tokyo, Japan

Uchida Misuzu
suzu.trb.trb@outlook.jp
Undergtraduate student
Meiji University
Tokyo, Japan

Sando Yuka
eu180267@meiji.ac.jp
Undergraduate student
Meiji University
Tokyo, Japan

Key words: Online Class, Higher Education, Active Learning, Interaction, Zoom, Synchronous

1.RESERACH BACKGROUDNS AND OBJECTIVE

To prevent infection of COVID-19, many educational institutions of higher education had started to conduct online classes around April and May. According to the research to national institution of higher education（MEXT 2020）on June 1st said that about 90% of the institution of higher education and 1066 schools conduct online classes, which uses digital technology, totally or partially. Meiji University, which authors belong to, started to conduct online classes from May 2020 as well.
Online classes promoted by Meiji University has three different types;
(1) Material/Assignment Posting Type, (2) On-demand Type (pre-recorded video streaming type) and (3) Real-time Delivery Type (synchronous interactive type)

Material/Assignment Posting Type and On-demand Type (pre-recorded video streaming type) is personalized learning. On the other hand, Real-time Delivery Type (synchronous interactive type) is a kind of active learning conducted online. The tools for Real-time Delivery Type (synchronous interactive type) is Zoom at Meiji University. Some students said that Online communication using Zoom makes students feel more comfortable and natural to speak out and have a discussion because of that multiple functions.

In Real-time Delivery Type (synchronous interactive type), students are less bound by power relationship, and they have more options to join the class in terms of ways to express ideas, reactions, and location according to Kishi (2020). Actually, in the class on Media Literacy, conducted by Prof. Kishi in School of Global Japanese Studies, Meiji University, students join discussion actively using multiple functions such as chat, reaction, Google Jamboard, or Google Slide on their own decision. The article from Asahi Newspaper (2020) reported that many students in Shonan-Fujisawa Campus, Keio University proactively state their ideas and opinions by using the chat function of Zoom.

The online class gives students a new experience of learning, in which they can join the classes in different ways. As one of the students, the authors also feel that online classes give us chances to participate in the classes actively.

However, although online class gives students chances to participate in classes actively, some students cannot do not have a positive attitude in online classes. For instance, even in the class of "Media Literacy," as mentioned above, some students remain their video camera off and have less active in expressing their opinions by both oral and texting.
Therefore, the authors wondered what differences between those who participated in classes actively and those who did not.

2. RESEARCH OBJECTIVE

In this research, the authors clarify the factors that make students less active in online classes. The uniqueness of this research is to describe why students can be active or less active in online classes from the viewpoints of students. The online classes mentioned in this paper indicate in Real-time Delivery Type (synchronous interactive type) that gives classes video conferencing, basically Zooms.

3. RESEARCH METHOD

To clarify the factors that make students active or less active, the authors conducted an online questionnaire for students who take online classes. Through the questionnaire, the authors asked the following questions
(1) Are there any differences in your mood when you speak out comparing an online class and off-line class? If there are, what kind of difference is that?
(2)Are there any differences in your attitude to listen to other students or teachers comparing an online class and off-line class? If there are, what kind of difference is that?
(3)Are there any differences in your mood when you do a group work comparing an online class and off-line class? If there are, what kind of difference is that?
(4)Are there any differences in your motivation comparing an online class and a off-line class? If there are, what kind of difference is that?

Data were collected from 40 students of the School of Global Japanese Studies, Meiji University. Then, the authors asked three students who participate in classes less actively. The authors employed interviews to describe more detail based on the data answered through the above questionnaire.

4. RESULT AND DISCUSSION

As a result of analysis, the authors found the 3 factors to make students less active in online classes.

(1) The necessity of self-regulation; because students take a class in their rooms, they have to manage their own attitudes towards a class.

(2) The structure which forces students to take a class alone

(3) The limitation of information about other students; students cannot find out how others work on classes and what they are good at.

The detail of result will be presented in the conference.

REFERENCES

Ministry of Education, Culture, Sports, Science and Technology Japan. (2020). Current situation of classes in higher educational institution under the pandemic of COVID-19. 1, pp.1. Retrieved from https://www.mext.go.jp/content/20200605-mxt_kouhou01-000004520_6.pdf

Nakamura, Masafumi (2020, April 30). The "Supreme Classes" starts in SFC, Keio University. Asahi Newspaper EduA. Retrieved from https://www.asahi.com/edua/article/13339850

Analysis of Learning Activities Using a Life Experience Board Game in Elementary

Atsushi Fujioka
af03160408@yahoo.co.jp
Graduate student
Nihon Fukushi University
Aichi, Japan

I analyzed the educational effects and external assessment using the Philippine-country life experience board game. In this study, we introduced the Philippines-country-life-experience board game as a teaching material. This board game has a mechanism that allows players to walk through life as if we had been born in the countryside of the Philippines, and experience a comprehensive living environment including money and work. In this board game, the conditions for the winner are not explicitly shown and will be discussed after the board game is over. As a result, many children answered that "the families with a lot of money are the winners," but as for another theme, "Is the life of the people living in the Philippine countryside happy?," many students answered, "the poor are happy." The answers were sometimes inconsistent. Therefore, the students discussed the results using external assessment, and analyzed their understanding. By using the Philippine-countryside- life experience board game combined with out-of-game assessments and discussions by the students themselves, it is possible to express the feelings that the students are not aware of. Besides, changes in knowledge acquisition and learning behavior about the social problems and international understanding in a primary school education are shown.

Keywords: Primary education, Board games, External assessment, international understanding education

INTRODUCTION

As the daily interaction with diverse people expands, it is important not only to understand people with different cultures, but also to have the ability to accept them and live together. Under such circumstances, social issues and education for international understanding have come to the fore in primary school as well. Humans acquire various knowledge and skills in their lives, and there is also a research result that shows that they obtain such skills through informal learning (LIFE Center, 2004). Various learning methods have emerged in the period for integrated studies and ethics subjects. At present, in educational programs for children, games with educational effects can sometimes be incorporated into learning. Komuro and Matsumoto (2009) developed "Ecopoly" for high school students to learn the relationship between environment and economy through board games. Otani (2015) developed board games as communication education. Fujimoto (2007) pointed out that efforts to develop and use games for social purposes other than entertainment are positioned as "serious games." Regarding educational effects, he mentioned "the improvement of motivation" and "improvement of learning and acquisition." On the other hand, learning by board games in primary education classes on social issues and international understanding has not been practiced so much.

PURPOSE

The practice of this research started from April 2019 at the class of international understanding education focusing on the Philippines in the integrated learning period of Kansai University elementary school. This school focuses on international understanding education during the integrated learning period. Since I am familiar with rural areas in the southern part of the Philippines, I, as a guest teacher, supported the 4th grade classes in the elementary school throughout the year since July. In the class, the students had a field experience using VR goggles, and in August, the teachers conducted fieldwork in the Philippines. In December, they also had video-conference exchanges with the students in rural areas of the Philippines. In February, I gave a lesson using the Philippine-country-life experience game as a tool for thinking about "happiness." The purpose of one-year-lesson is to improve the lesson from the viewpoint of "independent, interactive and deep learning," to deeply understand the content of learning and to acquire qualities and abilities. It is to realize high-quality learning that helps students actively learn as lifelong learners. The purpose of this research is to analyze educational effects and out-of-game assessments using the Philippine-countryside life experience board game, and to acquire knowledge and change learning behaviors of students in social problems and international understanding education.

PHILIPPINES COUNTRY LIFE EXPERIENCE BOARD GAME

This board game is an experiential game focusing on people living in the Philippine countryside. It faithfully reproduces the life of the countryside in the Philippines. We play the game following the result of dice as the person who was born in the Philippines countryside. In the game, the conditions to win are not explicitly shown. After the game, we discuss which item "more money," "the number of children," or "the number of happy chips," can lead us to the victory. Happy chips are the cards that represent the degree of happiness in this game. To proceed with the game, first of all, players get divided into four groups: "rich household, slightly rich household, ordinary household, and poor household." There are differences among them, such as the amount of money at the start of the game and the electricity and water facilities. A rich family has a lot of money with their good work and high salary, hence they can go to school freely. On the other hand, the poorer households have less money, the inability to go to school due to their low salary and work, and the poorer households tend to have more children. This is not just an in-game story, it surely happens in rural areas. Thus the game is designed to have the same ratio of school attendance and employment in reality.

Also, when we start the game, there are many opportunities to draw action cards. They represent a variety of events that take place in the Philippines that we can learn about the lives of the local people. Depending on the events on this action card, we can get happy chips. While happy chips increase through the game in all households, there is an element of luck. However, happy chips are designed to reach poor families more than rich families. In the region where a mass of disaster affects and frequent interruption of

water and power outages occur, happy chips gradually reduce only from rich households with water and electricity facilities. This game balance is roughly the same no matter how many times the game is played. Participants can experience the life of the Philippine countryside from their respective perspectives while being able to understand the overall state of life of the people.

METHOD

This study was conducted in a class with 27 4th grade students in Japan. They play a board game and put their nameplates on the themes that the student feels from the lives of people living in the countryside of the Philippines. The choices are “happy,” “not happy,” and “neither.” After the game is over, students conduct external assessment and debate. The nameplate may be changed at any time during the debate as their feelings change. As the material for external assessment, the results of the same board game played in other classes will be used. Finally, after taking assessments of other classes into account, the students themselves conduct an external assessment to derive the analytic results. As a guest teacher, I advise children of accurate information only when it is difficult for them to understand.

“External assessment” is a method to measure and evaluate the knowledge and activity handled outside the game activity (Ifenthaler, Eseryel, & Ge, 2012) using pre- and post-tests and questionnaires, which is common in many studies. Increased learning motivation and some desired changes in knowledge acquisition and learning behavior are shown. He also uses a paper-based board game. According to Yamada (1999), the educational significance of simulation teaching materials is related to the various conditions that compose an event that encourages independent thinking and involvement from the work, and realizes a real understanding of the learning content. It is helpful to understand them comprehensively and multilaterally, which can be involved in the development of decision-making power, and can raise interest. It is said that the paper-based experience-based board game, which is easy for children to participate from the game production stage, can easily guide the learner to the understanding of the structure of the real world in terms of social problems and international understanding education.

RESULT

While the students played board games, laughter and smiles were seen. After the board game, twelve of them answered “happy,” and only two answered “not happy” to the question: “Do you think the poor people in the Philippines are happy?” In addition, the other students were in a “neither” position. The post-game theme for the other classes was “Who is the game winner?” Twelve of them answered “money”, eleven did “happy chips,” two answered the number of “children,” and one answered “even.” It was the result that many opinions were based on “money.” From these data, it can be said that there is a certain contradiction that “a family with a lot of money wins in life, but the poor are happier.” Afterward, the

students evaluated themselves outside the game, and as a result of the analysis, not only “money” but also keywords such as “kindness,” “smile,” “child,” and “disaster” appeared. In response to the question, “Do you think the poor people in the Philippines are happy?,” 60% of the students changed to the opinion that “there are times when they are not happy,” and the nameplate was shifted toward “not happy.”

DISCUSSION

Although the content of the board game was serious such as international and social issues, the students were able to participate with a positive feeling. By utilizing the board game and performing out-of-game assessment, to the students expressed the feelings that they were not aware of. Besides, changes in knowledge acquisition and learning behavior about the social problems and international understanding in a primary school education were shown, as 60% of the students changed their opinions.

By utilizing the Philippine-country life experience board game and analyzing educational effects and out-of-game evaluation, it is possible to express knowledge acquisition and see changes in the learning behavior of students, in terms of social problems and international understanding education. I think it was valuable that the students were able to learn serious problems with a positive attitude. However, this board game was originally created with the idea of how to convey various things happening in the countryside to college students and young people who visit an orphanage in the Philippines for about a week. The content is not limited to the whole Philippines, but is a story of a limited poor area, so it is necessary for game participants to understand that as well. In addition, since there are many elements of living in outlaws in a poor area, I think that there are a certain number of students who think that the content is shocking. Based on these things, it can be said that in addition to the implementation of board games and out-of-game evaluation, advanced learning is inevitably necessary. Furthermore, while learning international understanding, it is important how to further connect to international cooperation and international contribution, and how to realize them.

REFERENCES

Komuro, T. & Matsumoto, T. (2009). Development of a Board Game “Ecopoly” for Education on Relationship between Environment and Economy, *Transactions of Japanese Society for International and Systems in Education, 26*(4), 339-348.

Ootani Tadasi 2015 Development and Trial of Board Games as Communication Education

Fujimoto, T. (2007) *Serious game: kyouiku ni yakudatsu digital game* (*digital game useful for education and society* in Japanese), Tokyo Denki University Press, Tokyo.

Yamaguchi, Y. (1999) *Development of Simulation materials for education and practice: New trial for geography learning (Simulation kyouzai no kaihatsu to jissen: Chiri gakusyu no atarashii kokoromi* in Japanese), Kokon shoin, Tokyo.

Ifenthaler, D., Eseryel, D., & Ge, X. (2012) *Assessment in game-based learning: Foundations, innovations and perspectives*, Springer, New York, NY.

LIFE Center (2004) About the LIFE Center http://life-slc.org/about/about.html (July 22, 2020)

High school students' online writing styles in a digital literacy SPOC

Mengqian Wang
wmq_daisy@pku.edu.cn
PhD Candidate
Peking University
Beijing, China

Wenge Guo
wgguo@gse.pku.edu.cn
Associate Professor
Peking University
Beijing, China

Qian Dong
st16625m@gse.pku.edu.cn
Doctoral student
Peking University
Beijing, China

Key words: Online writing; Digital literacy; Learner profile; Systemic functional linguistics; SPOC

ABSTRACT

Online writing, as a specific digital literacy practice, has been increasingly introduced to composition instruction and digital literacy instruction. However, high school students' online writing styles have not been addressed in detail yet. Based on a digital literacy SPOC (Small Private Online Course), we examined the online writing styles of 95 first year high school students from China.

Firstly, guided by systemic functional linguistics (Halliday, 1994), we developed a coding framework to analyze students' online essays. This framework includes 17 content indicators belonging to three dimensions, ideational meaning, interpersonal meaning, and textual meaning respectively. Secondly, two raters coded 285 online essays according to the coding framework. Thirdly, we conducted descriptive analysis and correlation analysis to describe high school students' online writing characteristics and identified 5 types of online writing styles. Fourthly, we adopted epistemic network analysis to investigate the characteristics of students of different online writing styles (Shaffer, Collier & Ruis, 2016). At last, we compared teachers' and students' perceptions of different types of students.

The results revealed that: (1) High school students had different writing styles in online environments, manifesting as five distinct profiles: ideational writers, interpersonal writers, textual writers, well-rounded writers, and struggling writers; (2) Both teachers and students highly recognized well-rounded writers but didn't reward or encourage struggling writers. (3) Teachers and students had different perceptions of

ideational writers, interpersonal writers, and textual writers. Teachers recognized the students who were better at expressing ideational discourse and textual discourse, while students got closer to the peers that were better at expressing interpersonal discourse. The findings provide new insights for online writing instruction aiming at improving students' digital literacy. First, online writing is academic, social, and multimodal, thus teachers should encourage students to write in a multifaceted way that keeps a balance among the ideational, interpersonal, and textual function of discourses. Second, the discrepancy of teachers' and students' perception of different writing styles reflected the digital gap between teachers and students. Teachers should consider online writing from students' view, and get a better understanding of teenage culture in the Internet.

REFERENCES

Halliday, M. A. K. (1994). *An Introduction to Functional Grammar* (2nd ed.). London: E. Arnold.

Shaffer, D. W., Collier, W., Ruis, A. R. (2016). A tutorial on epistemic network analysis: analyzing the structure of connections in cognitive, social, and interaction data. Journal of Learning Analytics, 3(3), 9-45.

How Online Ice Breaking Benefits Collaborative Learning

Kanna Horita
kannahorita@gmail.com
Undergraduate student
Meiji University
Tokyo, Japan

Kosei Kusumoto
koseikusumoto@gmail.com
Undergraduate student
Meiji University
Tokyo, Japan

Rina Hashimoto
rina84mt@gmail.com
Undergraduate student
Meiji University
Tokyo, Japan

Key words: ice breakers, collaborative learning, online classes

ABSTRACT

1. Introduction

Due to COVID-19, university classes are now rapidly shifting to online classes. In this situation, many students are confused about online classes. According to Nishikawa (2020), it is difficult for students to maintain a sufficient network environment, and most new students are in isolation. Some students are unable to enter the dormitory due to a sudden change in university policy, or mentally cornered by the situation where they have to attend classes lonely with few acquaintances. Uchiyama (2020) also pointed out the student's dissatisfaction with not interacting directly with the students around them. This shift had the most effect on collaborative learning classes or classes that "base on the idea that learning is a naturally social act in which the participants talk among themselves," (Gerlach, 1994), due to its necessity in building a good relationship among students working together to solve a problem, complete a task, or create a product. Compared with classes held in-person, building this relationship becomes harder due to the lack of opportunity to know each other, affected by the isolation of students.

There, the authors focused on ice breakers as an activity to form this relationship online. The authors have been experiencing the effectiveness of ice breakers through their activities in Kishi Seminar, in the School of Global Japanese Studies, Meiji University. The students met one another for the first time on an online platform because the seminar had been conducted online in order to prevent the spread of COVID-19. Under these conditions, students have been able to work productively and cooperatively, and we picked up ice breakers as our primary reason we were able to make ourselves comfortable working together in this seminar. Students who have only participated online, or have never met the other members in person, have also agreed that ice breakers led them to build their relationships with other seminar members. In this research, we will be clarifying how the ice breakers have affected the collaborative learning environment held on an online platform.

Table 1: The five ice breakers conducted

Charades	The facilitator sends a word to a player through a private chat, and the person who receives the word will have to act it out. Anyone may answer, and whoever with the correct answer will act out the next topic.
Pass the Word	Players are given a subject, and are asked to name a proper noun that is related to the subject (ex: subject can be fruits, where a proper noun can be an apple). Instead of going around in turns, whoever answers will assign the next player to answer and so on.
Make a Story	Participants are divided into groups of 4-5, and are asked to give examples from the parts of speech they are randomly assigned by the facilitator (ex: Facilitator asks participant A to name a noun, participant A will respond with a noun like "book"). These words are then placed in pre-made sentences, generating a story. The stories are then shared with other groups.
Color or Advance	Participants are divided into groups of 4-5, and are asked to select a speaker in their group. The speaker will tell a story about a given topic, and after every sentence, the listeners will ask the speaker to either "color," to go more in detail, or to "advance," to move on. If there is enough time, participants will switch roles to either a speaker or a listener.
Would You Rather (Debate Game)	Participants are divided into groups of 4-5. Each group will assign a person as a facilitator, and the rest are split into 2 teams. Topics are then handed to the group members, and the 2 teams decide on which side they want to take to give a presentation. Once decided, each team gets 30 seconds to give a presentation on their topic, for 2 rounds. The facilitator then chooses the winner based on how well their presentations were.

2. Overview of Practice

The Kishi seminar started classes online with both 3rd and 4th-year students from the beginning of April 2020. 3rd-year students have never had an in-person interaction, and their first exposure was through online Zoom. To help build their relationship, students designed their ice breakers, then practiced them through their online seminars. The five ice breakers we had used in class include the following requirements: full participation with communication, calling out participants' names, and an opportunity to see characteristics other than their first impression.

3. Methods

The authors conducted semi-structured interviews with some students in Kishi Seminar who have participated in online collaborative learning. The interviews included the following four questions: (1) How did you feel before participating in online collaborative learning classes?, (2) How did your feelings toward collaborative learning change through experiencing the online ice breakers? (3) Did your impression on other seminar students change after participating in the ice breakers? If so, how?, and (4) Which of the online ice breakers make you feel you got to know the other students better? Why?

Data were collected through a semi-structured interview with some students in Kishi Seminar, with the following two requirements: One is someone who participated in almost all of the ice breaking activities conducted before the starting of formal online classes. Second is someone who felt anxious or negative about online collaborative learning, mostly due to not knowing the other classmates. Based on these requirements, the authors chose five students to interview. The authors then analyzed the interview data based on the KJ Method. The authors transcribed all interview data and encoded it, then classified the codes into appropriate categories. The authors are going to present the result on the day of the conference.

REFERENCES

Department of Public Relations of Meiji University. (2020, April 14). *Seminar Activity has started on April 8th -Initiatives to Address Online Seminar at Kishi Seminar in School of Global Japanese Studies, Meiji University.* Retrieved July 12, 2020, from https://www.atpress.ne.jp/news/210658

Gerlach, J. M. (1994). *Is this collaboration?* In Bosworth, K. and Hamilton, S. J. (Eds.), Collaborative Learning: Underlying Processes and Effective Techniques, New Directions for Teaching and Learning No. 59.

Nishikawa, R. (2020, April 22). *Universities and Students Confused by COVID-19 Jiron Koron*. Retrieved July 21, 2020, from http://www.nhk.or.jp/kaisetsu-blog/100/428098.html

Uchiyama, I. (2020, May 23). *University Related: Diary about Online Classes in Universities the Latter Volume -Self-learning to Get Through a Crisis.* Retrieved July 21, 2020, from https://mainichi.jp/articles/20200521/org/00m/100/009000c?yclid=YJAD.1595336370.9steAQudcq3oUsaHVrdGBGwfTpV34ZAbx7SCfLoWBkTf6cXlS2zt5yFvNP109xh_VCylJ6X36mqsdOA

Designing Student-led English Activity as an Learning Experience

Rina Okazaki
okazakirina7@gmail.com
Undergraduate student
Meiji University
Tokyo, Japan

Minyu Cheng
Undergraduate student
Meiji University
Tokyo, Japan

Yohei Iwai
Undergraduate student
Meiji University
Tokyo, Japan

ABSTRACT

Japanese English education expects students to use perfect grammar (Inoue 2019) Therefore, Japanese students are uncomfortable speaking in English. The reason why they feel uncomfortableness towards English is because of the Japanese lectured style class., in fact according to the survey, 91% of the students have said their English class was held in lectured style with some activities but not so much. This style class expects students to know the perfect grammar rules which makes them afraid to make mistakes causing them a fear of using English with confidence. Also, students do not have enough chances to speak or to use English in class.

"Games used in language education can motivate students to work on mastering their target language more actively" (Kato 2011) In addition, the authors took a survey and found that "playful" English activities in class can make the students feel comfortable to get involved in the activities.

However, in traditional English learning style in Japan, because teachers are the one who grades the students, students have an image of them as a grader (Takahashi 2003). This role from each position makes students feel pressure to use English with perfect grammar. Thus, the authors pay attention to the subject who conducts the learning activities. If the teacher makes the reason why students think about the pressure

of being graded, the problem can be solved by making the students leading the English activities in the classroom. During student-led activities can make students forget about themselves being grated and actually enjoy themselves playing the game without hesitation on making mistakes.

Therefore, the authors will clarify how much students can feel comfortable in the activity which students-led English activities can be done casually and easier to participate without hesitation. Which encourages students to change the image of learning English by designing student-led playful English activities.

We have designed a few student-led English activities and have examined the activities to a group of 40 Meiji University students. We have designed two English activities:" pass the word" and "Let's make a story together". This led every student to feel involved in the game and the game doesn't require perfect grammar. In addition, the game has a "help system" in which students can ask for help. An online survey was distributed to students who experienced the activities. Students were asked the image of English before and after playing the game. Also, they were asked to compare the traditional Japanese English class with student-led activities. From the survey, we've interviewed those who have changed their image towards English after playing the game and what made them change their perception. The results indicate that students were comfortable using English because the activities allowed students to freely interact with each other. However, some students weren't able to enjoy the game.

On this basis, we have proved that student-led activities can provide students with an engagement to the activities because of the caring attitude and thoughtful construction. On the other hand, we have found challenges to make the game playful to every student. We have reached the conclusion that our future experiment should be conducted in the same level of English and practiced regularly based on the voice from the students who played the game and who made the game. Therefore, we will continue our research in English classes Universities.

REFERENCES

Inoue, S. (2014). *Future English Education and the Value of Grammar*: *Bulletin of International Pacific University* 8:165-174

Kato, E. (2011). *Language Education and Game, Internet, Education*: 31:28-33

Takahashi, S. (2003). *English Education and Grading. Teaching English Now*. 1:2-3

An Eye-tracking Study of Redundancy Effects in Multimedia Learning Resource with an Animated Pedagogical Agent

Suhyun Ki
lololhy@naver.com
Doctoral student
Chonnam University
Gwangju, Republic of Korea

Eunbyul Yang
yangbyul2@gmail.com
Doctoral student
Chonnam University
Gwangju, Republic of Korea

Jeeheon Ryu
jeeheon@jnu.ac.kr
Professor
Chonnam University
Gwangju, Republic of Korea

Key words: Multimedia learning, screen size, average fixation duration, fixation

ABSTRACT

The purpose of this study is to examine how the learners' attention focus change by analyzing average fixation duration and fixation count in multimedia resource with an animated pedagogical agent. Both average fixation duration and fixation count were used as measures of the level of concentration of learners, as well as the indicators of cognitive effort to process information. The participants of this study were 27 college students and they were divided into 2 groups by the size of the screen showing the multimeda learning resource. The multimedia learning resource was separated into 3 sessions(no text, labels, summary explanation) by the amount of text. And it had two kinds of areas of interest(AOI), one is the area of learning content and the other is the area of animated pedagogical agents. The findings of this study are as follows: First, there was an interaction effect between screen size and the content area because of the presence effects caused by the screen size. Second, the attention has not been paid to the animated pedagogical agent without social interaction. Third, the narration design of the animated pedagogical agent showed redundancy effects in the session of labels. However, in the session of summary explanation session did not show redundancy effects. Based on these findings, the strategies of text design were suggested to consider temporal contiguity effects.

REFERENCES

Ari, F., Flores, R., Inan, F. A., Cheon, J., Crooks, S. M., Paniukov, D., & Kurucay, M. (2014). The effects of verbally redundant information on student learning: An instance of reverse redundancy. Computers & Education, 76, 199-204.

Bylinskii, Z., Borkin, M. A., Kim, N. W., Pfister, H., & Oliva, A. (2015, October). Eye fixation metrics for large scale evaluation and comparison of information visualizations. In Workshop on Eye Tracking and Visualization (pp. 235-255). Springer, Cham.

Chan, K. Y., Lyons, C., Kon, L. L., Stine, K., Manley, M., & Crossley, A. (2020). Effect of on-screen text on multimedia learning with native and foreign-accented narration. Learning and Instruction, 67, 101305.

de Koning, B. B., van Hooijdonk, C. M. J., & Lagerwerf, L. (2017). Verbal redundancy in a procedural animation: On-screen labels improve retention but not behavioral performance. Computers & Education, 107, 45-53.

Doherty, S., O'Brien, S., & Carl, M. (2010). Eye tracking as an MT evaluation technique. Machine translation, 24(1), 1-13.

Kim, D., & Kim, D. J. (2012). Effect of screen size on multimedia vocabulary learning. British Journal of Educational Technology, 43(1), 62-70.

Knoop‐van Campen, C. A., Segers, E., & Verhoeven, L. (2018). The modality and redundancy effects in multimedia learning in children with dyslexia. Dyslexia, 24(2), 140-155.

Lai, M. L., Tsai, M. J., Yang, F. Y., Hsu, C. Y., Liu, T. C., Lee, S. W. Y., Chiou, G. L., Liang, J. C., & Tsai, C. C. (2013). A review of using eye-tracking technology in exploring learning from 2000 to 2012. Educational research review, 10, 90-115.

Liu, Y., Jang, B. G., & Roy-Campbell, Z. (2018). Optimum input mode in the modality and redundancy principles for university ESL students' multimedia learning. Computers & Education, 127, 190-200.

Liu, H.-C., Lai, M.-L., & Chuang, H.-H. (2011). Using eye-tracking technology to investigate the redundant effect of multimedia web pages on viewer's cognitive processes. Computers in Human Behavior, 27, 2410-2417.

Martha, A. S. D., & Santoso, H. B. (2019). The design and impact of the pedagogical agent: A systematic literature review. Journal of Educators Online, 16(1), n1.

Miksatko, J., Kipp, K., & Kipp, M. (2010). The Persona zero-effect: Evaluating virtual character benefits on a learning task with repeated interactions. In J. Allbeck, N. Badler, T. Bickmore, C. Pelachaud & A. Safonova (Eds.), Intelligent Virtual Agents (Vol. 6356, pp.475-481): Springer Berlin / Heidelberg

Ozdemir, M., Izmirli, S., & Sahin-Izmirli, O. (2016). The effects of captioning videos on academic achievement and motivation: reconsideration of redundancy principle in instructional videos. Journal of Educational Technology & Society, 19(4), 1-10.

Persson, J. R., Wattengård, E., & Lilledahl, M. B. (2019). The effect of captions and written text on viewing behavior in educational videos. LUMAT General Issue, 7(1), 124-147.

Qi, L. (Ed.). (2011). Information and Automation: International Symposium, ISIA 2010, Guangzhou, China, November 10-11, 2010. Revised Selected Papers (Vol. 86). Springer.

Tisdell, C., & Loch, B. (2017). How useful are closed captions for learning mathematics via online video?. International journal of mathematical education in science and technology, 48(2), 229-243.

Torralba, A., Oliva, A., Castelhano, M. S., & Henderson, J. M. (2006). Contextual guidance of eye movements and attention in real-world scenes: the role of global features in object search. Psychological review, 113(4), 766.

van Meel, C., & de Beeck, H. P. O. (2020). An investigation of the effect of temporal contiguity training on size-tolerant representations in object-selective cortex. NeuroImage, 217(2020), 116881.

Yildirim, Ç., Bostan, B., & Berkman, M. I. (2019). Impact of different immersive techniques on the perceived sense of presence measured via subjective scales. Entertainment Computing, 31, 100308.

Yilmaz, F. G. K., & Yilmaz, R. (2019). Impact of pedagogic agent-mediated metacognitive support towards increasing task and group awareness in CSCL. Computers & Education, 134, 1-14.

Yue, C. L., Bjork, E. L., & Bjork, R. A. (2013). Reducing verbal redundancy in multimedia learning: An undesired desirable difficulty?. Journal of Educational Psychology, 105(2), 266.

Factors Influencing of Creating Lessons in Collaboration with Informatics Teachers on the Transformation of Students' TPACK

Yuto YAMANOI
K484561@kansai-u.ac.jp
Master Student
Kansai University
Osaka, Japan

Wakio OYANAGI
oyanagi@kansai-u.ac.jp
Professor
Kansai University
Osaka, Japan

Mayumi KUBOTA
Mkubota@kansai-u.ac.jp
Professor
Kansai University
Osaka, Japan

Key words: TPACK , ImageMap, Project activity, High school, Information education

ABSTRACT

The purpose of this study is to clarify what factors influencing of project activities on the transformation of preservice teacher students' TPACK (Technological Pedagogical and Content Knowledge). Developing TPACK for preservice teacher students has been conducted in teaching practice. However, it has not been easy to develop TPACK for students in teaching practice in a limited time and environment (SATAKE and OYANAGI et al. 2017). Therefore, in this research, we pay attention to the experience in the field where the students carry out the project in cooperation with the school.

Kansai University Faculty of Informatics has been promoting a project to encourage students to acquire TPACK. In this project, students participate in high school informatics classes as support staff. Mainly, students create lesson plans and lesson materials in the project and explain the lesson contents to students. In addition, this project activity is a place where students participate.

The Central Council for Education (2012) emphasizes "high specialized knowledge about teaching subjects and teaching professions" and " acquisition of basic knowledge and skills" as the qualities and abilities required of teachers. According to SHIKAI and NAGAZOE (2018), the subject that is most required to adapt to daily changes is the "information" For example, in high school, programming education will be compulsory from 2022, and it will be reorganized into compulsory "Information I" and elective

course "Information II". Therefore, it is important to strengthen the TPACK of teachers in the information department.

For the research method, we adopt the case studies and action research. Participants in this study are four students. We compare image maps drawn by the student before and after project activities. Then, we try to identify the change of student's TPACK from the change of the image map (SATAKE and OYANAGI et al. 2017). We conduct the interview against students to clarify the factors behind the change in TPACK.

As a result of the analysis, it was found that "discussions on teaching methods handled in the project" and "making the good relationship between students and on-site teachers" had an influence as factors that promoted the transformation of TPACK.

In summary, it is important that we set up the time and place of the educational field experience for students and encourage experiential activities to promote the student's transformation of TAPCK. The students participating in this project are those who study informatics. They have much knowledge about CK, but little knowledge about PK. Therefore, Students should have the opportunity to reinvent their own knowledge through this project. It will be important for us to make the opportunities that students themselves think out such project activities in order to gain knowledge of TPACK.

This study is still in progress. There is a point that the data collection was insufficient due to the COVID 19. Therefore, we will continue to analyze in detail the relationship between students' TPACK transformation and activities through this project.

REFERENCES

Central Council for Education(2012) Measures to comprehensively improve the qualifications and skills of teachers throughout their teaching career (Chūō Kyōiku Shingikai (2012) Kyoushokuseikatsu no Zentai wo Tsuzita Kyouin no shishitsunouryoku no sougouteki na koujouhousaku nit suite)

Satake,Y.,Oyanagi,W.,Matukawa,T.,Ichihashi,Y.,Yamamoto,K.,Takemura,K.(2016).*A Development on Assessment Method of Identifying Transformation of Preservice Teacher's Practical Knowledge in Practicum -Focus on Technological Pedagogical Content Knowledge-* Bulletin of Teacher Education Center for the Future Generation. 2: 177-185

Satake,Y.,Oyanagi,W.,Matukawa,T.,Ichihashi,Y.,Yamamoto,K.,Takemura,K.(2017).*An Analysis on Relation of between Transformation of Practical Knowledge and the Factors of enhance "Technological Content Knowledge(TPCK)" of Preservice Teacher Students during Practicum ―A Focus on identifying ways to enhance TPCK of Preservice Teacher Students ―* Bulletin of Teacher Education Center for the Future Generation. 3: 51-61

Shikai,A.,Nagazoe,S.(2018).*Teachers of information studies are required to respond to change.* Reports of Faculty of Humanity-Oriented Science and Engineering, Kindai University. 28: 12-28

Video Media and Teacher Autonomy: Considering the impact of pre-recorded lessons on teacher agency during the Covid19 pandemic

Charlotte Dawson
charlotte.hicks@tuni.fi
MBA Educational Leadership Student
Tampere University of Applied Sciences
Tampere, Finland

Key words: autonomy, teaching, impact, online, pandemic

ABSTRACT

The Covid19 outbreak was given the status of 'pandemic' in March 2020. Global means of prevention included schools offering distance learning programs. Particularly in privatised education institutions, live and recorded lessons were prioritised, due to the competitive nature of schools and the need to make value for money explicit to current and prospective parents.

This qualitative research took the approach of a naturalistic inquiry in the form of a case study and investigated the phenomenon of remote learning in a real--life context. Observational notes were taken over a four-month period by a teacher-observer based in a Year 1 class (ages 5-6).

At the beginning of the remote learning period, teachers were set non-negotiable expectations which included transparent learning materials and a high level of consistency across the school, therefore disregarding creativity and professional judgement. Planning was heavily formalised and shared with parents, using Activinspire flipcharts voiced-over with a Screencast-O-Matic recording. Live sessions featured video tutorials on how to deliver content. Online pedagogy and curriculum adaptation was not supported by appropriate learning theory and excluded opportunities for social interaction and student engagement.

REFERENCES

Arsenault and Anderson, 1998, Flick, 2004a, 2004b, 2009 in Cohen, L., Manion, L., & Morrison, K. (2017). *Research methods in education*. Retrieved from https://ebookcentral.proquest.com

Petrovic-Dzerdz, M., & Trépanier, A. (2018 p9). Online hunting, gathering and sharing - A return to experiential learning in a digital age. *International Review of Research in Open and Distance Learning*, 19(2), 271–281. https://doi.org/10.19173/irrodl.v19i2.3732

Puentedura, 2014 in McKnight et al. (2016) Teaching in a Digital Age: How Educators Use Technology to Improve Student Learning, *Journal of Research on Technology in Education*, 48:3, 194-211, DOI: 10.1080/15391523.2016.1175856

The Effect of Thinking Tools on Essay Writing in Elementary School

Xu Juanting
K199933@kansai-u.ac.jp
Graduate student
Kansai University
Osaka, Japan

Kurokami Haruo
kurokami@kansai-u.ac.jp
Professor
Kansai University
Osaka, japan

Key words: Thinking tools, Digital thinking tools, Essay Writing

ABSTRACT

The purpose of this study is to find out to what extend essays written by elementary students will be changed by using digital thinking tools.

Kurokami (2017) points out that the utilization of thinking tools is helpful for thinking ideas and exchanging ideas with each other to create their own ideas. According to the Japanese Ministry of Education(2008) , Elementary School Study Guideline points out that in the Japanese language department, in order to cultivate the ability to write, there are 5 skills need to be instructed, which are “collect information”; “prioritize collected information”; “connection of sentences”; “habit of reread”; “exchange their thoughts”. Therefore, applying thinking tools may be helpful to develop the skill of “collect information” and “exchange their thoughts” in the essay writhing lessens.

The digital thinking tools were launched in March 2019. Users can select various thinking tools and put idea cards on them. About digital thinking tools, Kimura et al. (2016) have compared digital thinking tools with paper thinking tools and concluded that digital thinking tools are more convenient in organizing information and based on the organized information communication is more effective.

In this study, A research will be carried out in the grade 4 of an elementary school on essay writing lessens. These lessons will be held once a month to introduce thinking tools one by one and train how to use them. Students will write an essay before and after practicing using thinking tools. Comparison of both essays will be expected to reveal gains in length, complexity and structure of them.

Rubrics will be used to measure the gains. In addition, a questionnaire survey for students will be conducted to figure out the role of digital thinking tools.

REFERENCES

Japanese Ministry of Education, (2008) *Guidelines for Elementary School Learning Retrieved from* https://www.mext.go.jp/a_menu/shotou/new-cs/youryou/syo/koku.html

Kimura, A., Kurokami, H.& Horita, T. (2016). *Analog and Digital Comparison in Creating and Organizing Information Indexes* [PDF file]. Retrieved from https://doi.org/10.20755/jsdtp.5.0_13

Kurokami, H. (2017). *"Utilizing Thinking Tools in Primary and Secondary Education"* Information Science and Technology. 67 (10): 521-526

Socially Shared Regulation of Learning for higher education

Takaki KONDO
1720509@ed.tus.ac.jp
Master's student
Department of Mathematics and Science Education, Graduate School of Science,
Tokyo University of Science
Tokyo, Japan

Yuki WATANABE
Wat@rs.tus.ac.jp
Associate professor
Department of Mathematics and Science Education, Graduate School of Science
Tokyo University of Science
Tokyo, Japan

Key words: Collaborative Learning, Socially Shared Regulation of Learning, Reciprocity

ABSTRACT

In today's global economy, the ability to work productively, innovatively, and efficiently in teams is becoming a necessary skill. Higher education in Japan also needs to develop university student literacy (Central Council for Education 2008) and policies for diploma courses (Central Council for Education 2016). To develop these skills, universities must be transformed in ways that will enable students to acquire not only specialized knowledge, but also the sophisticated thinking, flexible problem solving, and collaboration skills. In other words, in traditional classes, teaching is unidirectional: teachers teach, students are passive. This approach has limitations, and there is an urgent need for a paradigm shift in education. However, higher education focuses on the mastery of compulsory and specialized subjects. Thus, the development of these skills is difficult in terms of both curriculum and time.

Regarding this problem, cooperative and collaborative learning plays a major role in the educational practices in universities. A meta-analysis on cooperative learning (Johnson et al. 1998) suggested that it is effective in developing the skills. On the other hand, problems with cooperative and collaborative learning include social loafing (Karau and Williams 1993) and group domination by one member (Rogat and Linnenbrink-Garcia 2011). For these reasons, cooperative and collaborative learning may not work well in some cases, and support is required to improve both forms of learning.

Hadwin et al. (2018) proposed that regulation for collaborative learning to work well is a socially shared regulation of learning (SSRL). SSRL means that groups collectively regulate their behavior, motivations, and emotions together in a synchronized and productive manner. Furthermore, Hadwin et al. (2018) suggested that three types of regulation were necessary for successful collaboration: self-regulated

learning (SRL), co-regulated learning (CoRL) and SSRL. Therefore, it is necessary to promote interaction with other members and provide mutual help and assistance in order to regulate the group's processes. In other words, reciprocity seems to be related to the success of group work, such as cooperative and collaborative learning. Reciprocity is an exchange of interests accompanied by a duty of reciprocation (Gouldner 1960). To put it simply, reciprocity means "Give back when you get help. On the contrary, if you help, it means you deserve to get help."

In this study, we would like to examine and discuss how to help build a reciprocal relationship in which all group members can contribute to each other's development.

REFERENCES

Central Council for Education. (2008). Gakushi Katei Kyouiku no Kouchiku ni Mukete (Toushin). https://www.mext.go.jp/component/b_menu/shingi/toushin/__icsFiles/afieldfile/2008/12/26/1217067_001.pdf (accessed 2020.07.31)

Central Council for Education. (2016). "Sotsugyo Nintei, Gakui Zyuyo no Hoshin" (Diploma Policy), "Kyouiku Katei Hensei Zissi no Hoshin" (Curriculum Policy) oyobi "Nyugakusya Ukeire no Hoshin" (Admission Policy) no Sakutei oyobi Unei ni Kansuru Gaidorain. https://www.mext.go.jp/b_menu/shingi/chukyo/chukyo4/houkoku/__icsFiles/afieldfile/2016/04/01/1369248_01_1.pdf (accessed 2020.07.31)

Gouldner, A. W. (1960). The norm of reciprocity: A preliminary statement. *American sociological review*, 161-178.

Hadwin, A. F., Järvelä, S., & Miller, M. (2018). Self-Regulation, Co-Regulation, and Shared Regulation in Collaborative learning Environments. *Handbook of self-regulation of learning and performance* (2nd ed.). Routledge/Taylor & Francis Group,

Johnson, D. W., Johnson, R. T., & Smith, K. A. (1998). Cooperative learning returns to college what evidence is there that it works? *Change: the magazine of higher learning*, *30*(4), 26-35.

Karau, S. J., & Williams, K. D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of personality and social psychology*, *65*(4), 681-706.

Rogat, T., & Linnenbrink-Garcia, L. (2011). Socially shared regulation in collaborative groups: An analysis of the interplay between quality of social regulation and group processes. *Cognition and Instruction*, *29*(4), 375-415.

Study on Activity Design of Development Project by Student Team: Focusing on Pre-learning and Reflection Using Spherical 360-degree Video

Takahiro Abe
nw150014@n-fukushi.ac.jp
Master Course Student
Nihon Fukushi University
Aichi, Japan

Key words: virtual reality, experiential learning, higher education

ABSTRACT

This research is aimed at an English teacher training support project in a Cambodian teacher training college in collaboration with three Japanese universities (Tokyo / Meisei University, Osaka / Kansai University, Aichi / Nihon Fukushi University).

We must be sure that we can produce results in a short stay. To that end, preparatory activities, ones in collaboration, and reflection of local activities are important, hence we decided to focus on them. First, we upload an immersive 360-degree video taken by a 360-degree camera to YouTube. Then, we watch the 360-degree video with a headset. As a result, it is expected to improve the reality from the preparatory stage to the activity, and to perform a deep reflection on it. Furthermore, high quality activities can be carried out continuously if appropriate transfer is possible to underclassmen.

At the same time, maintaining the motivation of the members is essential. According to Heidi (2013), all humans are classified into eight types. It was found that the behavior changed depending on the mindset and the presence of self-confidence. The confidence that the members of the project have in themselves approaches the success of the project. Comparing the success rate of the projects undertaken with those without self-efficacy, there is a 0.34 correlation. This number becomes a much shorter way to success than acquiring knowledge through skill tests. Letting members have a successful experience and learn from others' one can enhance the self-efficacy that is necessary for a successful project.

With VR, others' experience and the one of pseudo success will lead to the success of the project.

REFERENCES

Bailenson, J. (2018) *Experience on demand: What virtual reality is, how it works, and what it can do.* W. W. Norton & Company.

Halvorson, H. G. (2013). The 8 Motivational Challenges. Stephanie E. Turk.

Blended learning and critical thinking: Is it possible to develop critical thinking skills in low-income students in Brazil using a blende model?

Ana Paula C. Camargo
ana.ciriacocamargo@tuni.fi
Tampere University of Applied Sciences
Tampere, Finland

Key words: Critical pedagogy, Digitalization, Critical thinking, Socio-emotional learning.

ABSTRACT

The context of the research is a Brazilian social institute, which assists high achievement low-income (HALI) students to find better opportunities through education and self-development. Besides full scholarships to top-tier private schools, students also receive emotional support on all accounts of their experiences and a comprehensive on-site program aimed to improve socio-emotional skills, led by a team of psychologists and educators. One of the SE (socio-emotional) skills developed is critical thinking, chosen by its relevance in fostering youth leadership development (Jones 2010; Ennis 2016). In 2015, determined to expand its social impact, the organization designed and launched an online version of on-site program that reached more than 1500 students and the plans for the coming years include the national extension of the model.

Considering the aforementioned context and the opportunity of improving the online program, the main question is: is it possible to effectively develop critical thinking skills using a blended model? The intended focus is, though a critical perspective (Freire 1976; Gadotti et all 2009; Anyon 2011), to point out the issues of the use of online environments taking into account the tendency of digitalization in the educational field and the biases related to digital solutions and online environments (Bayne 2014; Selwyn 2010; Broughan et al 2019). A further question is to consider how we can approach the development of critical thinking skills in such a blended program, given the low-income background of the students.

This research is conducted as part of a thesis for an MBA in Educational Leadership at Tampere University of Applied Sciences in Finland and is commissioned by the Critical Applied Research of Digitalization in Education research group from Tampere University of Applied Sciences.

The method intended to be adopted so far is both qualitative and quantitative-based research; focus group and interviews with students may be used, and also data analysis from the platform through narrative analysis.

REFERENCES

ANYON, J. (2011). Marx and Education. New York, NY: Routledge.

BAYNE, S. (2014). What's the matter with "technology-enhanced learning"? Learning, Media and Technology, 40(1), 5–20. https://doi.org/10.1080/17439884.2014.915851

BROUGHAN, C., & PRINSLOO, P. (2019). (Re)centring students in learning analytics: in conversation with Paulo Freire. Assessment and Evaluation in Higher Education, 45(4), 1–12. https://doi.org/10.1080/02602938.2019.1679716

DELAHUNTY, A.,VERENIKINA, I. & JONES, P. (2014). Socio-emotional connections: identity, belonging and learning in online interactions. A literature review, Technology, Pedagogy and Education, 23:2, 243-265, DOI: 10.1080/1475939X.2013.813405

ENNIS, R. (2016). Critical Thinking Across the Curriculum: A Vision. Topoi, 37(1), 165–184. https://doi.org/10.1007/s11245-016-9401-4

FREIRE, P. (1976). Education, the Practice of Freedom. London: Writers and Readers Publishing Cooperative.

GADOTTI, M., & TORRES, C. A. (2009). Paulo Freire: Education for Development. Development & Change, 40(6), 1255–1267. https://doi.org/10.1111/j.1467-7660.2009.01606.x

JONES, A. (2010). Affective issues in learning technologies: emotional responses to technology and technology's role in supporting socio-emotional skills. Journal of Interactive Media in Education: JiME, 2010(2), 9–. https://doi.org/10.5334/2010-9

SELWYN, N. (2010). Looking beyond learning: notes towards the critical study of educational technology: Looking beyond learning. Journal of Computer Assisted Learning, 26(1), 65–73. https://doi.org/10.1111/j.1365-2729.2009.00338.x

STAIB, S. (2003). Teaching and measuring critical thinking. Journal of Nursing Education, 42(11), 498–508. https://doi.org/10.3928/0148-4834-20031101-08

SimTEACHER Mobile: Design and Development of Augmented Reality Simulation for Preservice Teacher? The Classroom Management Skill Training

Kukhyeon Kim
Kukhyeon8@gmail.com
Doctoral student
Chonnman National University
Gwangju, South Korea

Chaeyeon Kim
Rlacodus0224@gmail.com
Master student
Chonnman National University
Gwangju, South Korea

Daeun Kim
de1472581@gmail.com
Undergraduated -Master student
Chonnman National University
Gwangju, South Korea

Jeeheon Ryu
Jeeheon@jnu.ac.kr
Professor
Chonnman National University
Gwangju, South Korea

Key words: SimTEACHER Mobile, Augmented Reality(AR) Technology, Teacher Education, Teaching Simulation, Autonomous Avatar, Scoring Logic

ABSTRACT

SimTEACHER Mobile was created to provide preservice teachers with classroom management experience through an immersive simulation. In this simulation, the user can learn how to deal with emotional conflict situations by responding to the problem behavior of the virtual student. This simulation can provide real-time feedback, which can enable learners to reflect on their performance, and instructors will be able to understand the student's ability to perform classroom management. SimTEACHER Mobile consists of four main components.

First, to improve the accessibility of this simulation, we developed simulation based on Augmented Reality(AR) technology. Using AR technology, users can access the virtual student avatar anytime by scanning the AR triggers with their device.

Secondly, to develop authentic classroom scenarios, we consider the cultural characteristics of a typical US classroom. We created two scenarios through the observation from American school. Then, to validate the scenarios, we conduct a collaborative design process with an American teacher who has 24 years of teaching experience.

Thirdly, the virtual student avatar was designed to interact with users based on the Model of Interpersonal Teacher Behavior (MITB). The model describes the teacher-student relationships with two dimensions, the influence dimension (Dominance—Submission) and the affiliation dimension (Hostility-Friendliness). Virtual students are particularly designed to change their posture/gestures according to perceived dimensions determined by the user's input.

Lastly, performance graphs can visualize the user's evaluation. This simulation has the scoring logic, which computes a teacher's performance in real-time using two dimensions of MITB, depending on users' selected classroom management strategies. According to this logic, a user's interaction with virtual students

is mapped and their performance is analyzed and presented on the evaluation scoring dashboard. When the user completes the SimTEACHER Mobile simulation, his/her classroom management performance is presented in the form of a visualized MITB orthogonal coordinates through this logic.

SimTEACHER Mobile can provide the opportunity to demonstrate the necessary competencies to manage the problematic behaviors in the class. The advancement in the capability of simulation with AR technology is expected to provide significant benefits for training preservice teachers. The success of such simulation relies on authentic scenarios that are taking account of the cultural characteristics of US classroom. The scoring logic that suggests an autonomous response of virtual student avatars and performance graphs can promote users to reflect and modify their strategies. To further develop SimTEACHER Mobile, further studies will be needed to validate simulation scenarios and scoring logic and further develop a scenario repository for different grades, type of classroom management issues.

REFERENCES

Badiee, F., & Kaufman, D. (2014). The effectiveness of an online simulation for teacher education. Journal of Technology and Teacher Education, 22(2), 167-186.

Bradley, E. G., & Kendall, B. (2014). A review of computer simulations in teacher education. Journal of Educational Technology Systems, 43(1), 3-12. DOI: 10.2190/ET.43.1.b

Brekelmans, M. (1989). Interpersonal teacher behaviour in the classroom. Utrecht: W.C.C.

Bull, P. E. (2016). Posture & gesture (vol. 16). Elsevier.

Carrington, L., Kervin, L. K., & Ferry, B. (2011). Enhancing the development of pre-service teacher professional identity via an online classroom simulation. Journal of Technology and Teacher Education, 19(3), 351–368.

Carver-Thomas, D. & Darling-Hammond, L. (2017). Teacher turnover: Why it matters and what we can do about it. Palo Alto, CA: Learning Policy Institute.

Christensen, R., Knezek, G., Tyler-Wood, T., & Gibson, D. (2011). SimSchool: An online dynamic simulator for enhancing teacher preparation. International Journal of Learning Technology, 6(1), 201-220.

Colvin, G., & Scott, T. M. (2014). A seven-phase model for describing acting-out behavior.

In Colvin, G., & Scott, T.M.(Eds), Managing the cycle of acting-out behavior in the classroom. Corwin Press.

Cruz, B. C., & Patterson, J. (2005). Cross-cultural simulations in teacher education: Developing empathy and understanding. Multicultural Perspectives, 7(2), 40-47. DOI: 10.1207/s15327892mcp0702_7

Dalinger, T., Thomas, K. B., Stansberry, S., & Xiu, Y. (2020). A mixed reality simulation offers strategic practice for pre-service teachers. Computers and Education, 144, 103696. DOI: 10.1016/j.compedu.2019.103696

DeAngelis, K.J., Wall, A.F., & Che, J. (2013). The impact of preservice preparation and early career support on novice teachers' career intentions and decisions. Journal of Teacher Education. 64(4), 338-355.

De Jong, R., Mainhard, T., Van Tartwijk, J., Veldman, I., Verloop, N., & Wubbels, T. (2014). How pre-service teachers' personality traits, self-efficacy, and discipline strategies contribute to the teacher–student relationship. British Journal of Educational Psychology, 84 (2), 294-310.

Evertson, C. M., & Weinstein, C. S. (Eds.). (2006). Handbook of classroom management: Research, practice, and contemporary issues. Mahwah, NJ: Lawrence Erlbaum.

Ferry, B., Kervin, L., Cambourne, B., Turbill, J., Puglisi, S., Jonassen, D., & Hedberg, J. (2004). Online classroom simulation: The "next wave" for pre-service teacher education? In R. Atkinson, C. McBeath, D. Jonas-Dwyer, R. Phillips (Eds.), Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference (pp. 294– 302). Perth: Australian Society for Computers in Learning in Tertiary Education.

Ferry, B., Kervin, L., Hedberg, J. G., Turbill, J., Cambourne, B., & Jonassen, D. (2005). In P. Kommers & G. Richards (Eds.), Proceedings, World Conference on Educational Multimedia, Hypermedia and Communication (EdMedia) (pp. 3096-3103).

Chesapeake,VA: Association for the Advancement of Computing in Education (AACE).

Galarneau, L. (2005). Authentic learning experiences through play: Games, simulations and the construction of knowledge. Simulations and the Construction of Knowledge, Paper presented at the 2005 International DiGRA Conference, Vancouver, British Columbia, Canada.

Gibson, D. (2007). SimSchool and the conceptual assessment framework. In D. Gibson, C.

Aldrich, & M. Prensky (Eds.), Games and simulations in online learning: Research & development frameworks (pp. 308–322). Hershey, PA: Idea Group.

Gibson, D. (2013) Assessing teaching skills with a mobile simulation. Journal of Digital Learning in Teacher Education, 30(1), 4-10, DOI: 10.1080/21532974.2013.10784720

Girod, M., & Girod, G. R. (2006). Exploring the efficacy of the cook school district simulation. Journal of Teacher Education, 57(5), 481–497. DOI:10.1177/0022487106293742

Goh, S., & Fraser, B. J. (2000). Teacher interpersonal teacher behaviour and elementary students' outcomes. Journal of Research in Childhood Education, 14, 216–231.

Gregory, S., Dalgarno, B., Campbell, M., Reiners, T., Knox, V., Masters, Y. (2011). Changing directions through VirtualPREX: Engaging pre-service teachers in virtual professional experience. In G. Williams, P. Statham, N. Brown, & B. Cleland, Eds., Changing demands, changing directions, (pp. 491–501). Hobart, Tasmania: Proceedings ascilite Hobart 2011.

Hixon, E., & So, H.-J. (2009). Technology's role in field experiences for preservice teacher training. Educational Technology & Society, 12, 294–304.

Jones, V. F., & Jones, L. S. (2013). Comprehensive classroom management, creating communities of support and solving problems (10th ed.). Upper Saddle River, NJ: Pearson.

Kane, T. J., Kerr, K. A., & Pianta, R. C. (Eds.) (2014). Designing teacher evaluation systems: New guidance from the measures of effective teaching project. San Francisco, CA: Jossey- Bass.

Kaufman, D., & Ireland, A. (2016). Enhancing teacher education with simulations. TechTrends, 60(3), 260-267.

Kiesler, D. J. (1983). The 1982 interpersonal circle: A taxonomy for complementarity in human transactions. Psychological Review, 90, 185–214.

Leary, T. (1957). An interpersonal diagnosis of personality. New York, NY: Ronald Press Company.

Lewis, R. (2001). Classroom discipline and student responsibility: The student's view. Teaching and Teacher Education, 17, 307–319.

Lewis, R., Romi, S., Qui, X., & Katz, Y. J. (2005). Teachers' classroom discipline and student misbehavior in Australia, China and Israel. Teaching and Teacher Education, 21, 729–741.

National Center for Education Statistics (NCES), U.S. Department of Education. (2019). National Teacher and Principal Survey (NTPS) Overview. https://nces.ed.gov/surveys/ntps/overview.asp

Park, S., & Ryu, J.H. (2019). Exploring pre-service teachers' emotional experiences in an immersive virtual teaching simulation through facial expression recognition, International Journal of Human-Computer Interaction, 35(6), 521-533.

Rosson, M. B., & Carroll, J. M. (2002). Scenario-based design, In J. Jacko, & A. Sears (Eds.), The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies and Emerging Applications. New York, NY: Lawrence Erlbaum.

Scrivener, J. (2012). Classroom management techniques. Cambridge: Cambridge University Press.

Tracey, T.J . G.(1994).An examination of the complementarity of interpersonal behaviour. Journal of Personality and Social Psychology, 67, 864–878.

Tracey, T. J. G. (2004). Levels of interpersonal complementarity: A simplex representation. Personality and Social Psychology Bulletin, 30, 1211–1225.

Wentzel, K. R. (2002). Are effective teachers like good parents? Teaching styles and student adjustment in early adolescence. Child Development, 73, 287–301.

Wiggins, J. S. (1991). Agency and communion as conceptual coordinates for understanding and measurement of interpersonal behavior. In W. M. Grove & D. Cicchetti (Eds.),

Thinking clearly about psychology (pp. 89–113). Minneapolis, MN: University of Minnesota Press.

Wubbels, Th., Cre´ ton, H. A. & Hooymayers, H. P. (1985). Discipline problems of beginning teachers, interactional teacher behavior mapped out. Abstracted in Resources in Education, 20(12), 153.

Development of Online Video Contents for Teacher Training Program

Kohei Mimura
1719526@ed.tus.ac.jp
Master student
Tokyo University of Science Graduate school of science Department of Mathematics and Science Education
Tokyo, Japan

Yuki Watanabe
wat@rs.tus.ac.jp
Associate Professor
Tokyo University of Science Graduate school of science Department of Mathematics and Science Education
Tokyo, Japan

Key words: Lesson Study, Teacher Development, flipped-learning training

ABSTRACT

The aim of this study is the development of video contents to support research lessons in flipped Lesson Study. Lesson Study which means a method of in-school training, has been reported today as a training method that has received worldwide attention (e.g., Stigler 1999). Lesson Study is a training technique that consists of four steps: goal setting, planning, research lessons, and reflection (Lewis et al. 2006). Among these, three types of support for research lesson design have been emphasized: social support, emotional support, and instructional support (Laura et al. 2020). In this study, we developed a flipped-learning training system that employs video viewing and face-to-face instructional support for research classes. We designed a workshop-type group training to support the face-to-face research class. The purpose of the videos in the reversible classroom training is to create a common knowledge in the workshop. In this paper, we described the developed video content and the verification test, which is the evaluation criteria.

A preliminary survey was conducted on 43 teachers to determine their training needs. The results showed that there was a need for a method of teaching. So we developed 10 videos on the theory of instructional design (4 videos), motivation to learn (2 videos) and Active Learning (4 videos).

The video content was created by referring to the video content of the ondemand lecture given in the class of educational methods and technology, which is a compulsory subject of the course of the teaching course at A university in Tokyo. This class teaches basic knowledge of educational technology and has a lot of theoretical background. Therefore, we added a scene to introduce a specific teaching technique in the Active Learning video.

In addition to the development of videos, we also developed a test to confirm the learning content. Since the purpose was to create a common knowledge for workshop discussions, it was determined that the

necessary knowledge was Gagne's verbal information (Gagne et al. 2004). To ensure the accuracy of the answers, the question consists of six choices, with two options of "Not sure" and "Have no idea". The test of the contents is based on the objectives of each videos.

The effectiveness of these methods is currently being tested, and their effectiveness and efficiency will be analyzed in further studies.

REFERENCES

Stigler, J. W. And Hiebert, J. (1999) The Teaching Gap: Best Ideas From The World'S Teachers For Improving Education In The Classroom.New York: Free Press

Lewis, C., Perry, R. And Murata, A. (2006) How Should Research Contribute To Instructional Improvement? The Case Of Lesson Study. Educational Researcher, 35(3):3-14

Laura R. E. Stokes, Jennifer M. Suh & Timothy W. Curby (2020) Examining the nature of teacher support during different iterations and modalities of lesson study implementation. Professional Development in Education Volume 46, 2020 - Issue 1 97-111

Robert M. Gagne, Walter W. Wager, Katharine C. Golas, John M. Keller (2004) Principles Of Instructional Design. Holt, Rinehart and Winston, New York.

Using Technology to Support Children with Special Educational Needs in Ireland: Reflecting and pondering the formulation of a thesis question and title

Alexandra Corr
Alexandra.corr@tuni.fi
Tampere University of Applied Sciences
Tampere, Finland

Key words: Special Educational Needs, Special Education, Blended Learning, E-Learning, Face-to-face Learning

ABSTRACT

The context of this research is an educational institution in Ireland, which educates students with and without special educational needs from seven to twelve years old. At present, all students regardless of their special educational needs are required to attend five school days weekly, each school day totaling five hours and forty minutes (Citizens Information, 2020). Students in this institution present with many special educational needs including but not limited to Attention Deficit Hyperactivity Disorder (ADHD), Attention Deficit Disorder (ADD), Social Anxiety Disorder and Emotional Behavioural Disorder (EBD). Students with these mental health needs find the current education primary school system challenging and overwhelming and a decline in school participation, attendance and educational opportunity subsequently occurs (Bowers, 2019). Currently, the Irish school system lacks alternative school programmes for primary school children with these educational needs who face educational inequalities.

Research in the USA by Thompson et al (2012), indicates that students with health and education needs in the USA succeed when given the option of online learning. The injustice, lack of options and flexibility in the Irish education system, presents the following provisional research question: Does a blended model of education support the learning and well-being of primary school students with special educational needs in Ireland? The potential need for a blended learning approach in Irish primary schools will be researched in a thesis as part of an MBA in Educational Leadership undertaken at Tampere University of Applied Sciences in Tampere, Finland and commissioned by the Critical Applied Research of Digitalization Educational research group. This thesis proposal is at an early stage and the specific questions for the thesis are still being formulated. The presentation will reflect and ponder the formulation of the thesis question and possible research approaches, defining special education and the needs, face-to-face learning, e-learning, models of blending learning and the support of students, teachers and educators.

REFERENCES

Bowers, S (2019, November 5). Tusla finds 60, 000 children miss school every day. *The Irish Times.* https://www.irishtimes.com/news/education/tusla-finds-60-000-children-miss-school-every-day-1.4073226

Citizens Information. (2020, July 28). Starting School. Citizens Information. https://www.citizensinformation.ie/en/education/primary_and_post_primary_education/going_to_primary_school/primary_education_life_event.html

Thompson et al. (2012). *Online Schools and Children with Special Health and Educational Needs: Comparison With Performance in Traditional Schools. 14* (3), 1-9. https://www.researchgate.net/publication/224871148_Online_Schools_and_Children_With_Special_Health_and_Educational_Needs_Comparison_With_Performance_in_Traditional_Schools

Research on Functional Design of Collaborative Graphical Programming Tool

Qing Hao
imhoaking@gmail.com
Master student
Tianjin Normal University
Tianjin, China

Tiantian Shi
stt1019@126.com
Master student
Tianjin Normal University
Tianjin, China

Key words: Graphical programming, Function design, Distributed pair programming

INTRODUCTION

Programming skills are gradually valued by the international industry and education, and increasingly become the focus of implementation of innovative talent training strategies in countries around the world. Governments of all countries are actively promoting intelligent education for all, and carry out K-12 programming education activities. At present, the programming education in primary schools mainly uses graphical programming software such as Scratch and Alice to design and create works to complete programming tasks. Graphical programming tools are more suitable for the cognitive level of primary and middle school students, and have obvious advantages in reducing the cognitive burden of students, helping students maintain creativity, enhancing learning interest and improving programming thinking.

Pair programming & Distributed pair programming

Pair programming (PP), involves two students sharing one computer, and there are clear roles: one is the driver who works the keyboard and mouse while the other navigates (Werner & Denning, 2009). The difference between distributed pair programming (DPP) and PP is that the former allows geographically distributed teams to collaborate and share program code. To carry out distributed pair programming well, a distributed pair tool with relevant functions is needed to meet the collaborative editing and synchronous communication of distributed pair. Currently available tools include XPairtise, Saros, RIPPLE, etc. DPP has a beneficial effect on remote collaboration in distance education (Hanks, 2008; Stotts et al., 2003).

Collaborative graphical programming

Collaborative editing tools have been widely used in recent years due to their real-time, distributed, and unconstrained features. At the same time, there have been many platforms for collaborative programming, such as CoPilot, FlooBits, and so on. However, K-12 students usually use graphical

programming tools as the main carrier of their programming learning. It is found through the investigation of the existing tools that there are few graphical programming tools that can realize collaborative editing and simultaneous communication by multiple people. It can realize that students are not limited by time and place, and in a graphical programming environment, students can have greater autonomy and can complete their work more efficiently (Bradbury et al., 2019). Although NetsBlox has been designed and developed (Bradbury et al., 2019), which is a block-based educational programming environment based on the visual programming language Snap, implements parallel programming, we still insist that in the face of the increasing tool demand of users, there are still a large number of gaps in collaborative graphical programming tools, and the functions still need to be improved. Therefore, we believe that the research on the functional requirements of collaborative graphical programming tools is very valuable.

RESEARCH DESIGN & RESULTS

In this study, a questionnaire survey was used to investigate the functional requirements of collaborative graphical programming tools for fifth and sixth grade students in a primary school in Tianjin, and semi-structured interviews were conducted with front-line information technology teachers.

Results of the questionnaire

In this study, a primary school in Tianjin was selected for investigation. After the preliminary investigation, it was learned that a total of 164 fifth and sixth grade students had used graphical programming platforms, such as Scratch, Mind+, etc. A questionnaire survey was conducted to this part of the students, and a total of 164 questionnaires were distributed, with 152 valid questionnaires, and the effective rate was 92.7%. A total of 152 subjects were studied, including 79 boys and 73 girls, 45 in fifth grade and 107 in sixth grade.

In addition to personal information, the questionnaire contains 17 items, which are divided into two dimensions: functional needs survey (15 items) and attitude survey (2 items). The last question is titled multiple choice, and the rest of the questions are indicated by students according to Likert's five-level scale of which 1 means strongly agree and 5 means strongly disagree.

According to descriptive statistics, boys score higher than girls in each item. Different grades have little difference in the selection of all items. The proportion of "strongly agree" and "agree" on each functional need survey item has reached more than 70%, so we believe that these functions are necessary.

Interview results

This study conducted an interview with three teachers, who are first-line information technology teachers of different levels, and all have been teaching for more than 6 years. The outline of the interview is as follows:

①Do you understand pair programming, distributed pair programming, and collaborative programming? Have you experienced pair programming, distributed programming, and collaborative programming in teaching? How do you feel if you have experienced it?

②What kind of software do you currently use to teach programming?

③Are you satisfied with the functions realized by the current programming software? What functions do you think can be improved?

Through interviews with three teachers, it can be knowed that the current front-line teachers are not fully applying pair programming and distributed pair programming in IT courses or community classes. Graphical programming tools such as Scratch are mainly used in the elementary school stage, and in the middle school stage, Python programming is mainly used. The synergy, operation convenience, and error prompts of programming tools suitable for the education field need to be further improved.

FUNCTIONAL DESIGN OF COLLABORATIVE GRAPHICAL PROGRAMMING TOOL

Based on the results of questionnaire surveys and interviews, this study combines the functions of the existing collaborative editing system to design the functions of collaborative graphical programming tools. Its main functions are shown in Table 1.

Table 1 Collaborative graphical programming tool functions

Function module	Function item	Function description
Collaborative graphical programming	Collaborative programming	Synchronous/asynchronous implementation of collaborative graphical programming Upload/download collaborative programming files Invite members to join collaborative programming
	Code block annotation	Each code block shows the creator and creation time Prompt error code block Reply code block comments
	Programming log	View historical operation records of collaborative programming files View saved versions of collaborative programming files View member contributions of collaborative programming files
User management	User information	Modify personal basic information (nickname, password, etc.) View/modify team information (nickname, member information, etc.)
	Work space	View/New collaborative programming file Create personal/team footage
Communication Session	Text dialogue	Text dialogue with collaborating members
	Voice communication	Real-time voice and video communication with collaborative members
	File transfer and sharing	Send/share files (videos, images, audios, animations, etc.) to collaboration members

The collaborative graphical programming module mainly includes three sub-projects, namely collaborative programming, code block annotation, and programming log. On the basis of traditional graphical programming tools, the collaboration function is added. The user completes the programming task through collaboration. During the collaboration process, the code block displays the creation information of the code block. If there are errors in the use of code blocks, the tool can also provide error prompts, and can also be used to communicate with the code block annotation function. At any time, collaborative members can view the programming log (file history operation records, each saved version,

member contribution). Edit and save, it is easy to trace the programming behavior of the collaborative members and conduct effective collaboration. The user management module is mainly for the user and the work projects that the user participates in. The user can complete the editing of personal/team information. The work space stores each work project that the user participates in, and the personal or team commonly used materials will also be saved to the material in the library. The communication session module is used for communication between members of the collaboration. The methods include text dialogue, voice communication, and file transmission and sharing. The communication session can improve the collaboration efficiency.

We believe that a collaborative graphical programming tool with the above-mentioned functions can better improve the quality of programming and its programming efficiency. It can allow multiple people to perform collaborative programming at the same time, that is, edit and save, and trace the programming behavior. There is no doubt that in the field of education, this tool can help students to promote relationships with collaborating partners and improve cooperation awareness, which is very conducive to the development of K-12 programming education.

CONCLUSION

Using graphical programming to teach programming skills to elementary school students is a very good paradigm. However, more research is needed for the functional suggestions made by this research, because the sample size of the survey in this study is still small, and it is only concentrated in primary schools. In addition, at present, the author's team did not carry out the system design and development of the above-mentioned ideas, but only put forward such requirements. In a real-world programming environment, there are many more factors worth considering, such as network connection speed. We hope that more relevant platforms will emerge and be widely used in K-12 programming education to improve learners' programming ability and collaboration ability.

REFERENCES

Bradbury, A., Wiebe, E., Vandenberg, J., Tsan, J., Lynch, C., & Boyer, K. (2019). The Interface Design of a Collaborative Computer Science Learning Environment for Elementary Aged Students. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 63(1), 493–497.

Hanks, B. (2008). Empirical evaluation of distributed pair programming. *International Journal of Human-computer Studies \/ International Journal of Man-machine Studies*, 66(7), 530-544.

Stotts, D., Williams, L., Nagappan, N., Baheti, P., Jen, D., & Jackson, A. (2003). Virtual Teaming: Experiments and Experiences with Distributed Pair Programming. *Lecture Notes in Computer Science*, 129-141.

Werner, L., & Denning, J. (2009). Pair Programming in Middle School: What Does It Look Like?.. *Journal of research on technology in education*, 42(1), 29-49.

Research on the Interaction between Teaching Disposition and Teaching Ability of Elementary school New Teachers in China

Yuxuan Tao
k022052@kansai-u.ac.jp
Master course student
Kansai University
Osaka, Japan

Haruo Kurokami
kurokami@kansai-u.ac.jp
Professor
Kansai University
Osaka, Japan

Key words: Elementary school new teachers,Teaching disposition, Teaching Ability, Interaction

ABSTRACT

BACKGROUND

In China, the curriculum for teacher training has been reformed in the 21st century.In accordance with the intention of the “teacher education curriculum standard”, each university seems to be revising its own curriculum for teacher training, and the number of universities with teacher training courses is increasing.

At the same time, students graduated from liberal art majors would take training courses and obtain related licenses in order to work in the education industry,after all they assume teacher is ideal kind of stable profession.As the result,the current dilemma is that students’ own interest get ignored which leads to the teaching disposition problem.

PREVIOUS RESEARCH

In the United States, "knowledge", "skill", and "attitude" have been professionally required for a long time, but there are many vague points in the content of "attitude". The disposition is expressed as a concept contained therein, which indicates a posture with a perspective of what to specifically feel and what to do toward an attitude change.(Oyanagi 2010b).

When new teachers enter the field of education, they are often shocked by reality and have a negative sense of discomfort caused by an imbalance between their individual and the environment.(Matsunaga 2017b).Their passion for work is diminishes. In other words, it can be seen that the reality shock causes a great change in the teaching disposition of new teachers.

The teacher's motivation and the new teacher's sense of self-competence and health in the teaching profession are closely linked. Mutual causal relationships between motivation and the state of improvement of new teachers' qualifications also have an important impact on new teachers' teaching ability.

In other words, it is recognized that new teachers encounter various circumstances in the field of education, and their teaching disposition after choosing the job is unstable, and that changes in such a state affect the qualifications and abilities of new teachers.

RESEARCH DESIGN&METHODS

In this study, I chose a teacher from an elementary school in Zhangjiakou City ,Hebei Province,China as my research target,and carried out interviews three times within a year.Finally I recorded enough data for teaching disposition.The interaction between the change of teaching disposition and teaching ability are analyzed, and the method of creating and maintaining a benign cycle of both parties is examined.

I hope it will help new teachers from elementary schools in China to get used to the workplace more smoothly and improve their teaching ability.

REFERENCES

Oyanagi,W.(2010,March 31). A Preliminary Study on Disposition as Qualification and Competency of Teacher -A Trend on Study around Teacher Disposition in USA.*Bulletin of the Integrated Center for Educational Research and Training,*19,153-160.

Matsunaga,M.,Nakamura,N.,Mimura,M.,Harada,Y. (2017). Development of a scale for measuring the factor of first-year teachers' reality shock. *The Japanese Journal of Psychology,*88,337-347.

Discussion on the construction of classroom management model in live online teaching

——Based on the perspective of remote interaction theory

Feng Guanchao
2360615779@qq.com
Postgraduate student
South China Normal University
Guangzhou, China

Key words: live online teaching,interaction hierarchical model,classroom management

ABSTRACT

Under the COVID-19 situation, there are nearly 200 million students in China who have been learning online. Teachers and students are starting an unprecedented "classroom revolution" across the Internet. According to the online teaching status and quality analysis report data of Chinese colleges and universities, various colleges and universities have carried out a variety of online teaching include recorded teaching, live online teaching, both recorded and live online teaching, MOOCs, etc., among which live online teaching accounts for more than half, reaching 53.54%.

As a new form of distance education, live online teaching, compared with the traditional offline teaching, has the characteristics of further improving students' dominant position, gradually forming the interactive classroom, and showing the advantages of classroom management under the support of instructional technology. At the same time, because of the live online teaching classroom is a "virtualized" classroom constructed by students in all over the country through mobile internet technology, teachers must confront many unprecedented problems in the process of classroom management. Such as the selection of media technology, the inadaptability to the multiple changes, and the management of teaching quality. At present, there is a lack of research on the classroom management of live online teaching. Therefore, from the perspective of remote interaction theory and based on the hierarchical model for student and teacher interaction in distance learning(陈丽&王志军,2016), this study constructed the Classroom management model in live online teaching. In this model, the live teaching process is divided into three stages: before class, during class and after class, and the three stages correspond to the three interactive levels of the interaction hierarchical model. This study systematically discusses how to carry out efficient classroom management in live online teaching, in order to provide an idea for classroom management of live online teaching from the perspective of remote interaction theory. It should be noted that due to the particularity and complexity of the live broadcast classroom, teachers should flexibly apply the model to classroom management practices according to the cognitive level of learners and other factors. The live online teaching

classroom management model formed in this study is currently only at the theoretical stage. The follow-up research needs to apply it to the live online teaching practice, and further tested, revised and developed in the practice.

REFERENCES

陈丽, &王志军. (2016). 三代远程学习中的教学交互原理. 中国远程教育, 000(010), 30-37.

Development of Environmental Education Simulation Based on Interaction of hands with Virtual Objects Using Leap Motion

Min Cho
mloje98@gmail.com
Undergraduate Student
Chonnam National University
Gwangju, Republic of Korea

Yewon Lee
leunoian1864@gmail.com
Undergraduate Student
Chonnam National University
Gwangju, Republic of Korea

Key words: Interaction, Environmental Education, Leap Motion

ABSTRACT

This simulation is intended to enable environment education targets to learn environmental pollution-related terminology from desktop-based simulations and to recognize its seriousness. By interacting with objects and avatars using hand models implemented through Leap Motion, learners can learn terms and precautions related to environmental pollution. Also, learners can check what you have learned through quizzes.

Environmental pollution is a serious global problem that occurs all over the world. Pollution caused by global warming, indiscriminate use of fossil fuels, and household waste is a problem that needs to be solved internationally. In order to solve environmental pollution problems, preserve the environment, and recognize the seriousness, education is provided to inform the causes and types of environmental pollution. However, existing environmental pollution-related education is limited to pictures and text, making it difficult for learners to immerse themselves. Therefore, to compensate for the limitations of existing education programs, we would like to develop a simulation in which learners can take the initiative in learning.

The simulation will provide the learners with activities to decontaminate the environment with their own hands. This allows learners to have an indirect experience of environmental pollution resolution. The equipment used is Leap Motion. Leap Motion is a device that recognizes the position, movement, and gesture of the learner's hand and allows it to be reflected in the simulation. Simulation with Leap Motion allows learners to experience solving environmental problems directly with their own hands. The learners' direct experience leads to the enhancement of learning effects by immersing himself in the situation and promoting interest and motivation. This helps learners form knowledge of the defining areas of

environmental pollution. Also, learning about cognitive areas will be done through avatar narration and learning content verification quizzes.

Through this simulation, learners can experience cleaning up the global environment, including the ocean, and learn about the causes of marine pollution. It is expected that learners will be able to learn about environmental pollution with a high sense of reality and interest.

REFERENCES

Lim C.S, Park S.M. (2019). Analysis of Elementary School Students' Self-Perception on the Affective, Behavioral and Cognitive Domains of Science Instruction. ELEMENTARY CCIENCE EDUCATION, 38(3), 360-374.

A Study on Teacher's Speech Analyzing during Class based on Morphological Analysis

Yuchen Wang
ywang@mxdlab.net
Undergraduate
Ritsumeikan University
Shiga, Japan

Sho Ooi
SHO.OOI@outlook.jp
Assistant professor
Ritsumeikan University
Shiga, Japan

Takeshi Goto
tk4goto074@gmail.com
Teacher
Oji Elementary School
Nara, Japan

Haruo Noma
hanoma@fc.ritsumei.ac.jp
Professor
Ritsumeikan University
Shiga, Japan

Key words: Teacher's Speech Analyzing, Morphological Analysis

ABSTRACT

Communicating between teachers and students is essential in order to make classes that are easy for students to understand. We have focused on the behavior of teachers in the classroom and have studied the analysis of differences in behavior between newcomers and professionals (Sho Ooi et al. 2020). This study aims to build a feedback system to reflect and to improve the teachers speak, we analyze the teacher's speech during a class. Specifically, we extract text information from the teacher's speeches such as the questions, the answers by students, and an explanation. Then, we used MeCab (Taku Kondo 2005) which a morphological analysis of the extracted text, and we use Oseti (Nozomi Kobayashi et al 2005 and Masahiko Higashide et al. 2008) to determine whether a student's response to a response is negative or positive. Figure 1 shows the process flow of our analysis method in this study.

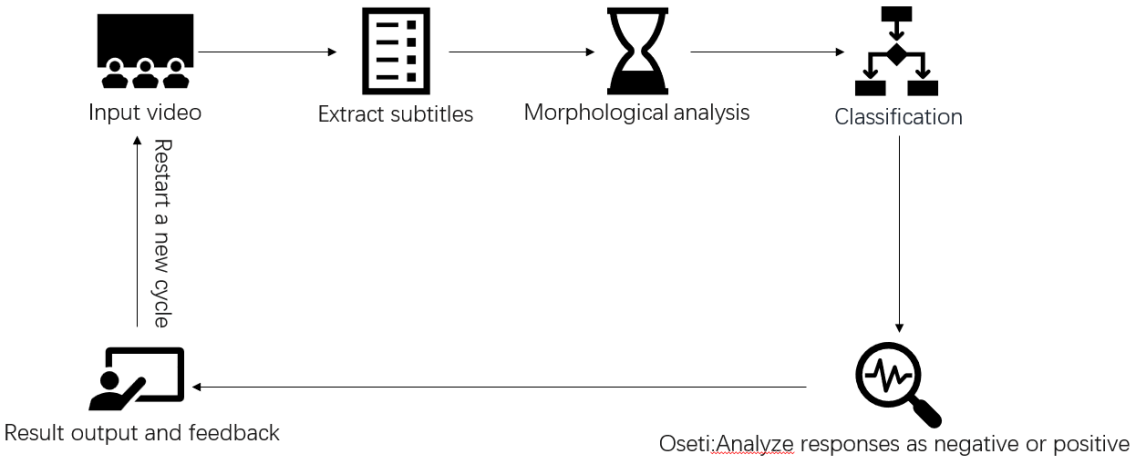
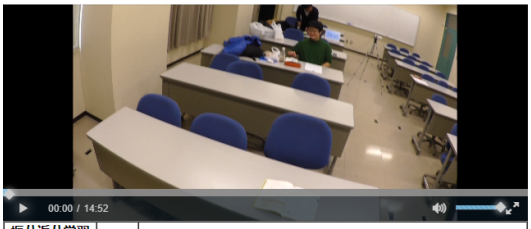


Figure 1 the process flow of our analysis method.

As the step of this system, first, our system performs morphological analysis with MeCab of text generated from audio using transcription software. But the standard dictionary does not include a directive sentence or an explanatory sentence; therefore, we add a directive sentence or explanatory sentence, create a new dictionary. And we verify the accuracy of the classified text with a new dictionary.

Second, it's all represented on a web page for easy feedback to teachers. As a structure, the output results such as the class videos, reflection points, and remarks are displayed on a web page as shown in Figure 2 and Figure 3. Here, Users can click on a reflection point to be taken to the scene in the corresponding video. This feature allows users to look back without having to review the entire class video.



振り返り学習ポイント	ne/po	字幕
注釈1	po	指示:覚えてますか児島君覚えてますか 説明文:ここから軸と頂点がわかるよ
注釈2	po	指示:X2乗+6X+9ー因数分解しましょう何が入りますか 説明文:(X-3)は惜しいな符号はここー致すんね
注釈3	po	指示:軸は? 説明文:軸は-3X=を忘れないようにしときましょう
注釈4	po	指示:頂点は? 説明文:頂点が-3-9という風になっていきますよ
注釈5	po	指示:最初にあったみたいに二乗を作りたいから4足して4引いてって言うな形でやってもいいけど 説明文:だいたい半分にして半分の2乗を外に出して
注釈6	po	指示:カッコ1とカッコ2あるのでやってみてください 説明文:できる人は問の7までやって行ったらいいかなと思います
注釈7	po	指示:あとはプラスいちつけといてください 説明文:そしたら計算できるとこが出てきます
終了		

Figure 2 a non-beginner teacher

振り返り学習ポイント	ne/po	字幕
注釈1	po	指示:教科書の10ページの初め段落3行ぐらいかなちょっと音読してください 説明文:はいありがとう
注釈2	po	指示:これはどちと思いますか? 説明文:デジタル因みに理由を聞いていいかな?
注釈3	po	指示:因みにアナログっていった理由をわかるアナログの理由は? 説明文:波だからはいそうです波ですね正解です
注釈4	po	指示:離散的って何?みたいな 説明文:言ったらも簡単にいうと点ですよ
注釈5	po	指示:これはどちですかこれも聞いていこうかな? 説明文:さっきどこに行ったか!君から
注釈6	po	指示:デジタル因みに理由を聞いていいかな? 説明文:うんなんとなく
注釈7	po	指示:えーとじゃ次!君どち? 説明文:アナログはい
注釈8	po	指示:デジタルって言ったら何になると思う?B君 説明文:うんそうやね大体ワードとか
注釈9	po	指示:電卓どうやろう電卓ってこれどう思う?Eさん 説明文:これってデジタルしかないよね
注釈10	po	指示:じゃ次にG君かなG君えはいどちだと思う? 説明文:アナログ因みに理由はやっぱなんとなくね
注釈11	po	指示:人を数える時に1点1点1言わないでしょうなんでかそれが離散 説明文:全部が全部と言いませんよけど
注釈12	po	指示:人力で誰が文字を送ってくれてますか違いますよね 説明文:はい電波って書くと分かりにくいんですよ
終了		

Figure3 a student

As experiments, we targeted two teacher's class. One is a non-beginner teacher who teaches mathematics at high school, the other is a student who studies to teach computer science at high school. We analyzed speeches between one non-beginner teacher and one student during each class, respectively. This study was conducted based on a review of the Research Ethics Review Committee at Ritsumeikan University (No. Kinugasa-Hito-2018-51).

As a result, first, the accuracy of the verification results with the new dictionary was 87.5 percent using the confusion matrix. We believe that this result is a sufficient result for automatic analysis.

Next, from the results of this analysis, we found that it was related to the content of the lesson and the number of questions teachers asked students. The other is that, in general, people who have been teaching for a long time may have the image of asking many questions, but even that this experiment uses different class data, the student asked twice as many questions as the teacher. Maybe teachers who have been teaching for a long time may not use more questions to improve students' participation in class, but use other methods. I would like to verify this in future research.

Summary, there are two future issues. After all, the detection accuracy of the system will not provide the user with all the points to look back and learn as it is, so a more accurate system is required. Second, this research is part of the original research, and we would like to verify whether introducing this will make users learn better than before.

REFERENCES

Sho Ooi, Shunyu Yao and Haruo Noma (2020). Study on Visualization of Different Teacher Behavior Based on Teacher Experience during Trial Class, *2020 European Advanced Educational Technology Conference*.

Taku Kondo (2005). MeCab: Yet another part-of-speech and morphological analyzer. http://chasen. org/~ taku/software/mecab/

Nozomi Kobayashi, Kentaro Inui, Yuji Matsumoto, Kenji Tateishi. (2005). Collecting Evaluative Expressions for Opinion Extraction, Journal of Natural Language Processing 12(3), 203-222.

Masahiko Higashiyama, Kentaro Inui, Yuji Matsumoto. (2008). Learning Sentiment of Nouns from Selectional Preferences of Verbs and Adjectives, Proceedings of the 14th Annual Meeting of the Association for Natural Language Processing, pp.584-587.

Examination of Two Types of Visual Information Emphasis Methods: Towards Effective Presentation

Kaito Yamamoto
yamamoto.kaito.268@s.kyushu-u.ac.jp
Bachelor student
Kyushu University
Fukuoka, Japan

Kyosuke Hamasaki
hamasaki.kyosuke.826@s.kyushu-u.ac.jp
Bachelor student
Kyushu University
Fukuoka, Japan

Laura Blanco
blanco.laura29@gmail.com
Doctoral student
Kyushu University
Fukuoka, Japan

Miharu Fuyuno
m-fuyuno@design.kyushu-u.ac.jp
Assistant Professor
Kyushu University
Fukuoka, Japan

Key words: Presentation, Visual Information Emphasis Methods, Comprehension

INTRODUCTION

As presentation skills are important for a variety of settings, such as schools, higher education, and businesses, they have been recently introduced into the official Japanese school curriculum. In general, audience comprehension of presentations is significantly influenced by the speaker's nonverbal behavior, provided visual information, and visual content. For example, in a study on the relationships between gaze distribution and program comprehension, Sawahata et.al (2008), conducted an experiment to determine the visual information emphasis and found that there was a significant improvement in audience comprehension when subtitles were displayed and when the speaker pointed specific information on a flip board with his finger.

Purpose of the Research

As speech and eye contact depend on the speaker's ability, it is necessary to practice to improve. Therefore, this study examined methods to emphasize visual information that could be easily used by people with little experience giving presentations or speech anxiety. Presentation videos were created using two different emphasis methods and the audience's comprehension of the presentations were compared.

RESEARCH DESIGN & METHODS

Experiment Content

Two groups of participants, ten participants each, were asked to watch presentation videos that had the same content but two different presentation patterns: visual information that was enhanced using textual emphasis (animation) (Condition 1) and visual information that was enhanced using indicator bars (Condition 2). To unify the elements in each video other than the emphasis method, the audio was recorded, and the speaker wore a mask so that it would not be recognized as a recording. The audience participants were second- and third-year students at a four-year university, all of whom were majoring in arts and engineering.

Experimental Flow

After explaining that following the presentation the participants would need to complete a questionnaire, the presentation was displayed on a large screen, after which an evaluation questionnaire and a comprehension test were completed.

Evaluation Questionnaire

Participants were asked to rate four items on a five-point scale: interest in the topic, clarity, impression of the presenter, and ease of viewing the slides, and an open-ended question was used to determine whether any unintended factors had affected the experiment.

Comprehension Test

A total of 13 questions were given in a selective format; 11 questions were taken from the portion of the presentation that had been emphasized, and two questions did not have an information emphasis.

RESULTS

Results of the Evaluation Questionnaire

All items for Condition 1 had higher values. There was no specific indication of the effectiveness of the pointing rod; however, the open-ended comments stated that the animation had assisted in comprehension.

Results of the Comprehension Test

The percentage of correct answers was higher in Condition 1 and there was a significant difference between the two conditions. In Condition 1, the percentage of correct answers was higher for the questions with emphasis, while in Condition 2, the percentage of correct answers did not change regardless of the emphasis.

Discussion

Because the animated information emphasis increased comprehension and no difference was found for the instructional rods, it could be surmised that using animation with simple colors and movements increased comprehension,. Nevertheless, large body movements from the speaker could interfere with comprehension because it might distract the audience.

The results of the study are expected to be useful for presentation skills education. The effectiveness of textual emphasis (animation) can be applied to various situations such as when a teacher mainly uses screen-share.in long-distance education.

REFERENCES

Sawahata, Y., Komine, K., Hiruma, N., Itou, T., Watanabe, S., Suzuki, Y., Hara, Y. & Issiki, N. (2008). Determining Relationship between Eye-Gaze Distribution and Comprehension of TV Programs. *The Journal of The Institute of Image Information and Television Engineers*, *62*(4), 587-594.

Active Learning Practice in Mathematics Class Aimed at Improving LX Level

Daichi Taketaka
1719514@ed.tus.ac.jp
Master student
Tokyo University of Science Graduate school of science Department of Mathematics and Science Education
Tokyo, Japan

Yuki Watanabe
wat@rs.tus.ac.jp
Associate Professor
Tokyo University of Science Graduate school of science Department of Mathematics and Science Education
Tokyo, Japan

Keywords: Learning Experience, Motivation, ARCS Model, Mathematics Education

ABSTRACT

High-school students lack the motivation for secondary mathematics education (MEXT 2018), which is a serious issue. Motivation is related to attitudes, which are influenced by experiences. Therefore, positive attitude toward learning depends on the quality of in-class experiences, and few studies have focused on how to improve the quality of learners' in-class experiences.

Parrish and Wilson (2008) said that Learning Experience (LX) as framework about in-class experience and defined the levels of Learning experience. The LX level indicates the level of student engagement in a particular class. A traditional classroom is teacher-centric. However, from the viewpoint of transformative LX, Parrish (2009) pointed out that class style needs to be learner-centric. Thus, a lecture-style class is not suitable for transformative LX. Based on the above discussion, teachers need to introduce instructional strategies into classes for improving the quality of learning.

The purpose of this research is to investigate whether LX level, motivation, and attitude toward learning improve by introduction of instructional strategies in classrooms. Therefore, we investigated changes in LX levels, attitude, and motivation in four classes by conducting pre- and post-questionnaire surveys. The questionnaire consists of four key constructs, which were assessed using 26 measurement items. We received 76 valid answers from high-school students. The four constructs covered in the questionnaire are as follows: LX level; attitude; motivation; and the Course Interest Survey (CIS). The CIS assesses motivation from the perspective of ARCS model. Additionally, we conducted free description responses about learning activity with changing LX levels to the students and collected their responses. Then, the Wilcoxon Signed-Rank test was used to analyze LX levels, motivation, and attitude. The results show a

significant improvement trend in LX levels and significant difference in the items of motivation and attitude. Based on the results of the free description responses, we found that the learners who summarized their learning in notebooks and queried their teachers about topics they didn't understand improved their LX level.

In conclusion, we believe that these results contribute to the improvement of learning quality in the following two ways. First, the teacher could improve students' LX level, motivation, and attitude by introducing instructional strategies in class. Second, this research could provide instructional design guidelines for improving LX levels, motivation, and attitude toward learning.

REFERENCES

Parrish, P., and Wilson, B., (2008) A Design and Research Framework for Learning Experience

Parrish, P., E., (2009) Aesthetic principles for instructional design. Educational Technology Research and Development, 57(4): 511-528

Ministry of Education, Culture, Sports, Science and Technology (2018) Koutou Gakkou Gakusyuu Shidouyouryou Kaisetsu Suugakuhen Risuuhen

Learning Management System Adoption in Schools: A consideration of the impact on teachers' professional ethics

Nathalie Lossec
nathalie.lossec@tuni.fi
Postgraduate Student (Masters of Educational Leadership)
Tampere University of Applied Sciences
Tampere, Finland

Nicholas Millar
nicholas.millar@tuni.fi
Postgraduate Student (Masters of Educational Leadership)
Tampere University of Applied Sciences
Tampere, Finland

Key words: Learning Management System (LMS), Big Data, EdTech

ABSTRACT

The proliferation of privatised Learning Management Systems (LMS) in both private and public education and the open-endorsement by the Department for Education (2020) in the UK for the specific use of Microsoft or Google's educational platforms has resulted in varying school-based leadership decisions. Consequently, a void has grown between the use of these LMSs in secondary education to "help" with the datafication of students and the ethical standards expected of educational practitioners. Yet, the big question is "who is helping who?" Past, current, and emerging literature suggests that the pace of technological development in this sector and the rights of stakeholders involved are on diverging paths, particularly concerning data collection, safeguarding and what has been dubbed the 'digital data assemblage' (Lupton, 2016). Additionally, LMS use not only enables the tracking and surveillance of students but also of teachers too (Watters, 2020).

As a result, the objectives of this study are firstly to understand the rationale for the adoption, management, and development of a commercial LMS. Secondly, we aim to identify and investigate new ethical conflicts for educators linked with the implementation of one specific LMS: Google for Education. Therefore, in order to appreciate how LMSs are endorsed, we will initially form a focus group of Senior leaders from different (secondary) schools located in London and Prague with whom we will conduct interviews. Furthermore, through quantitative survey research we will collect data on the changes of professional ethics from teachers' perspectives by questioning _ secondary school teachers. These respective experiences will then be compared with existing legislation from the current Department of Education (UK) and Ministerstvo Školství, Mládeže a Tělovýchovy (The Czech Ministry of Education, Youth and Sports) on teaching standards.

Results section; The research is still ongoing at the time of writing however, we predict that due to the level of transparency between ministerial and corporate leadership and also between the aforementioned and school leadership, new ethical dilemmas have been created for frontline educators through the use of Google for Education. Our hypothesis is that teaching standards may need to be reviewed in order to protect, guide teachers/educators and provide clear guidance on LMS adoption and implementation in order to secure the online safety of students and to stem the over-collection of children's data. In literature, there remains little evidence that specific governmental bodies have strived to address these issues and further discussion and articulation need to be established in this area. Consequently, we offer an alternative narrative for the review of teaching standards and the development of policies on privatised LMS adoption in education. This work is commissioned by CARDE (Critical Applied Research of Digitalization in Education), a research group at Tampere University of Applied Sciences, Finland.

REFERENCES

Department for Education (2020). *Schools to benefit from education partnerships with tech giants*. [online] GOV.UK. Available at: https://www.gov.uk/government/news/schools-to-benefit-from-education-partnership-with-tech-giants.

Lupton, D. (2016). *Digital companion species and eating data: Implications for theorising digital data–human assemblages.* Big Data & Society. https://doi.org/10.1177/2053951715619947

Watters, A. (2020). Building Anti-Surveillance Ed-Tech! In conversation with Audrey Watters, Contact North,online video conference 20/07/2020

Verification of the Effectiveness of Developing Problem-Solving Skills Based on Engineering Design Thinking

Koki Tamaki
1719515@ed.tus.ac.jp
Master student
Tokyo University of Science Graduate school of science Department of Mathematics and Science Education
Tokyo, Japan

Yuki Watanabe
wat@rs.tus.ac.jp
Associate Professor
Tokyo University of Science Graduate school of science Department of Mathematics and Science Education
Tokyo, Japan

Key words: Engineering Design, Problem-solving, Information

ABSTRACT

New abilities need to be developed, and problem solving within them also needs to be developed. For example, Griffin et al. (2012) proposed 10 skills in 21st century skills. Some of them is critical thinking, problem-solving, and decision-making skills. In Japan, the development of problem-solving skills is one of the goals of common course information, and it is recommended to introduce problem-solving activities in classes and to learn problem-solving skills (MEXT 2018).

In this study, we focused on Engineering Design as a framework of problem solving to clarify the skill of problem solving. Engineering design is a framework for problem-solving that consists of three problem-solving scenes: define, develop, and optimize. We proposed a new problem-solving framework based on engineering design.

This paper clarifies the process of problem solving and verifies the effectiveness for the improvement of problem-solving ability by learning this problem-solving framework. First, the students performed problem solving activities without knowing the framework of problem solving. The problem-solving activities were carried out in groups of four or five. Next, we taught students the problem-solving framework. And after the class, the student did the same problem-solving activities as the first one. We conducted a survey on student's awareness of own problem-solving abilities before and after activities. In addition, after each problem-solving activity, students self-evaluated their problem-solving activity and their group-wide problem-solving activities. And, the process of developing the solution during the problem-solving activity

was described the worksheet, and the text data of the group chat was recorded. The problem-solving framework was also evaluated by the students.

From the results of self-evaluation of problem-solving activities, there was a significant difference mainly in the problem-solving scene of Define. Only individual problem-solving activities differed, and group problem-solving activities did not differ. This was because the problem-solving activities were inappropriate and the group could not solve the problem. Or it could be due to problem-solving activities through group chats that students are not familiar with. From the chat log, some groups were able to find changes during the problem resolution activity, and there were conversation defining the problem to be solved. The evaluation of the proposed problem-solving capability framework was well received. It is thought that it is easier to generate a solution by understanding the problem-solving framework. Based on this research, it will be used for class design to develop problem-solving skills.

REFERENCES

GRIFFFIN, P., MCFAW, B., & CARE, E. (2012). *Assessment and Teaching of 21st Century Skills*. Springer, pp.18

Ministry of Education, Culture, Sports, Science and Technology(MEXT). (2018). *Courses of Study.*

The Next Generation Science Standards. (2017). Disciplinary Core Ideas 3-5.Engineering Design. https://www.nextgenscience.org/sites/default/files/3-5Topic.pdf (accessed 2020.05.25）

The meta-analysis of the effect of teaching simulation

Aram Shin
ars060233 @gmail.com
Doctoral student
Chonnman National University
Gwangju, South Korea

Kukhyeon Kim
Kukhyeon8@gmail.com
Doctoral student
Chonnman National University
Gwangju, South Korea

Jeeheon Ryu
Jeeheon@jnu.ac.kr
Professor
Chonnman National University
Gwangju, South Korea

Key words: virtual teaching simulation, meta-analysis

ABSTRACT

The purpose of this study is to confirm the effect sizes of teaching simulation and the size of a relationship among relevant variables through a meta-analysis. Virtual class simulation is a simulation in which a pre-service teacher(PST) can act as a teacher in a virtual classroom environment and train the teaching strategies that a teacher should have (Christensen, Knezek, Tyler-Wood, & Gibson, 2011; Deale & Pastore, 2014). In particular, virtual class simulations are known to enhance the interpersonal skills of prospective teachers (Theelen, Beemt, & Brok, 2019). Examples of virtual simulations include SimSchool and Musion in the U.S. and SimTEACHER in Korea. In addition, a virtual class simulation like VirtualPlex and MILE is produced based on a virtual reality platform such as SecondLife to provide teacher training (Ke, Lee, & Xu, 2016). Each simulation has different characteristics because it is based on different platforms. There are differences in how to operate it like pc-based or HMD-wearable types, and also differences in the purpose of use, such as teaching strategy practice and student counseling training.

As virtual class simulation is constantly being developed and experimental studies are being conducted to verify the effectiveness of the simulation. Studies was conducted to confirm changes in the teaching strategies of prospective teachers, classroom management skills, and changes in teachers' behavior through the use of virtual class simulation. Because these simulations are aimed at teaching teachers, there are many studies that measure effectiveness mainly through measuring teacher self-efficacy and the frequency of certain teaching behaviors. Teacher self-efficacy is often used as an indicator of the effectiveness of teacher education because teachers who have a high level of self-awareness of their roles as teachers have more confidence in their teaching lives and have a high level of satisfaction as teachers. In addition, in a virtual education program, a sense of reality has a significant impact on the user's level of immersion in the situation and is an important factor that eventually affects the effectiveness of learning.

Other studies also check the usefulness of the program to confirm the educational usefulness of virtual class simulation as one educational program.

However, discussions still exist on whether the use of virtual class simulations has had a real impact on improving the ability for prospective teachers. Since virtual class simulation has different types of class simulation platforms, such as training purposes and how to use them, it is necessary to discuss the effectiveness of different simulations. It is also necessary to discuss a unified overall effect because the types of questionnaires used are different.

Therefore, the purpose of this study is to confirm the effectiveness of virtual class simulation training for Pre-service teachers. In particular, this study identified the effectiveness from various perspectives by identifying the teacher self-efficacy, the sense of virtual presence, and usefulness as factors that affect virtual class simulation learning.

In this study, 'Science Direct', 'PsycArticles', 'Web of Science', 'JSTOR' and 'RISS' engines were used for research papers published at South Korea and abroad for 2010-2020. The search keyword was 'teaching simulation', 'teacher', 'pre-service teacher', and 'teacher education'. Among 129 studies, a total of 10 research papers were identified, except for experimental studies that were not pre-service teachers, were not experimental studies such as qualitative or meta-study, or did not provide average or standard deviation. Final 10 research papers were restricted into research papers which measured teaching efficacy, teacher efficacy, usability and actuality as dependent variables.

Dependent variables were put into teacher self-efficacy, the sense of virtual presence or reality, and usefulness. Two analyses were made according to the study design. First, the two-group pre-post design and the two-group post-design produced hedge'g effect size using the 'metacont' formula in R program. Second, the single group pre-post was calculated using the 'metagen' formula. The results in table 1 and table 2.

According to the results of the two-group pre-post design and the two-group post-design as shown in table 1, the effect size of the virtual classroom simulation is small; ES=0.1788(fixed effect), ES=0.1990(random effect). The effect size of the sense of the virtual presence is also small; ES=0.3054(fixed effect), ES=0.3054(random effect). The effect size of the perception of usefulness is middle negatively; ES=-0.5597(fixed effect), ES=-0.5638(random effect).

Table 1 the effect size of the two-group pre-post design and the two-group post-design

dependent variable		case	SMD	95%- CI	p- value	I^2
Teacher self- efficacy	Fixed effect	11	0.1788	0.0088; 0.3489	0.039	40.5
	Random effect		0.1990	- 0.0294; 0.4274	0.0877	-
The sense of virtual presence	Fixed effect	4	0.3054	- 0.0416; 0.6525	0.0845	0
	Random effect		0.3054	- 0.0416; 0.6525	0.0845	-
The perception on usefulness	Fixed effect	2	- 0.5597	- 1.0484; - 0.0710	0.0248	30.2
	Random effect		- 0.5638	1.1491; 0.0215	0.0590	-

According to the results of the single group design as shown in table 2, the effect size of the virtual classroom simulation is small; ES=0.0224(fixed effect), ES=0.0044(random effect). The effect size of the sense of the virtual presence is also small; ES=0.2065(fixed effect), ES=0.2563(random effect). The effect size of the perception of usefulness is also small negatively; ES=-0.1217(fixed effect), ES=-0.2371(random effect).

Table 2 the effect size of the single group pre-post

dependent variable		case	SMD	95%- CI	p- value	I^2
Teacher self- efficacy	Fixed effect	11	0.0224	- 0.0549; 0.0996	0.57	88.6
	Random effect		0.0044	- 0.2297; 0.2386	0.9705	-
The sense of virtual presence	Fixed effect	5	0.2065	0.0239; 0.38911	0.0267	85.2
	Random effect		0.2563	- 0.2204; 0.7331	0.2919	-
The perception on usefulness	Fixed effect	3	0.0296	- 0.1217; 0.1809	0.7015	78.1
	Random effect		0.1065	- 0.2371; 0.4500	0.5436	-

In conclusion, virtual classroom simulation could help improve teacher self-efficacy but the effect size is small. This means virtual classroom simulation can help pre-service teacher's competency, but not as much as the teaching practice. This result can explain why virtual simulation cannot replace the teaching practice. But it is sure that the virtual classroom is a useful tool to improve the pre-service teacher's teaching self-efficacy.

REFERENCES

Christensen, R., Knezek, G., Tyler-Wood, T., & Gibson, D. (2011). SimSchool: An online dynamic simulator for enhancing teacher preparation. International Journal of Learning Technology, 6(2), 201-220.

Deale, D., & Pastore, R. (2014). Evaluation of simSchool: An instructional simulation for pre-service teachers. Computers in the Schools, 31(3), 197-219.

Theelen, H., Van den Beemt, A., & den Brok, P. (2019). Classroom simulations in teacher education to support preservice teachers' interpersonal competence: A systematic literature review. Computers & Education, 129, 14-26.

Ke, F., Lee, S., & Xu, X. (2016). Teaching training in a mixed-reality integrated learning environment. Computers in Human Behavior, 62, 212-220.

Audio-Visual material in teaching a power generation using piezoelectric element

Akihito KITO
kito@ynu.ac.jp
Associate Professor
Graduate School of Education, Yokohama National University
Yokohama City, Japan

Liang Shuang
LiangShuang312@outlook.com
Graduate student
Graduate School of Education, Yokohama National University
Yokohama City, Japan

This paper is intended as producing of Audio-Visual material in teaching a power generation using piezoelectric element. First step, through 5 experiments, we collected the data about the degree of generating voltage when a stress was added to piezoelectric element, for instructing to students. In first experiment, 4 persons added by hand bending, a stress to the piezoelectric element which connected with only oscilloscope, and the voltage was measured. In the second experiment, full-wave rectifying circuit using piezoelectric element, was built and stored an electricity by the above hand bending. Then we measured the time electronic sound generated from sound IC (integrated circuit). In the third experiment, the experiment result of the second and the third were compared on same condition except the number of capacitors increased. In the fourth experiment, the experiment result of the third and the fourth were compared, on same condition except generating electricity method by a finger's tapping piezoelectric element. In the fifth experiment, the experiment result of the third and the fifth were compared on same condition, except that an output component was changed to an LED. Second step, we edited video recording these experiments, and produced an Audio-Visual material. The object of Audio-Visual material was that students didn't recognize the generated voltage to be little, when students learned piezoelectric element in technology education at junior high school. The Audio-Visual material was evaluated by technology education teachers, so its validity was confirmed

Key words: Audio-Visual material, Teaching material, Power generation, Piezoelectric element, Technology education

INTRODUCTION

In modern society of technology developed, electricity is used very much in our life. Examples of electricity use are too frequent to enumerate. Because of using at everything: family life, traffic, internet, Lighting, power source, calculation and telecommunication, etc., we may say that electricity is basis of wealth in modern society, as well as being a lifeline.

Opportunity that we study electricity at school of compulsory education, is arranged in elemental school science from the third grade to the six grade (MEXT, 2018a), junior high school science and technology education (MEXT, 2018a). In these curriculum, school children study intermittently about the character of electricity, making and using of basic electric circuit, structure of electromagnetic induction and power generation, etc.

The authors had idea that teachers deal with piezoelectric element in learning power generation at school. So power generation learning contains experiential activity in general, this is an opportunity that

school children can understand about an amount of the electric current and the voltage through experiment of lighting, etc. In other words, it seems reasonable to suppose that power generation learning is identified as start point of study on all electricity law, and as the base of the electric circuit designing and making, energy environmental problem.

School children learn the structure of thermal, hydraulic and nuclear power generation, in elemental school social studies and junior high school technology education. However, these contents mainly consist of method of power generation using electromagnetic induction by rolling movement. In addition, there is secondary learning contents: photoelectric cell, battery by an electrolyte of a fruit. Current curriculum is composed of only learning contents of the above method of power generation, although school children move on to the next grade/year, or is going on to school of high grade. Therefore, the authors proposed that piezoelectric element is incorporated into the kind of power generation method in learning contents. Also it is assumed that intellectual curiosity is derived, and an interest are enhanced in school children.

A character of piezoelectric element is that the voltage occurs from adding a stress. Conversely, the object is bended from adding a voltage. It's used in various electric device: speaker, vibration sensor and ignition, etc.

There were some studies related to the performance of power generation using piezoelectric element, in the field of electrical engineering. For example, Takahashi (2013) reported that power generation using piezoelectric element became highly efficient by many parallel setting, through experiment of comparing with electromagnetic induction energy. Also, Hagita (2017) indicated that the method of stress adding of piezoelectric element was related to an amount of the voltage of power generation, through the experiment of stress adding by three type method: pushing extending shearing. In another studies of electrical engineering field, there were various studies related to utilization of piezoelectric element, for example, design of a micro pump (Yamaguchi etc., 2005).

In the field of education, there were some existing studies related to teaching material of power generation using piezoelectric element. Kikuchi and Onodera (2011, 2012) developed the teaching material that electromotive forces generation using piezoelectric element was displayed on the seven segment LED. And they practiced a class that sound IC (integrated circuit) was playbacked a music, after explaining piezoelectric element to Junior high school the third grade children, too. Also Kikuchi etc. (2013) practiced a class of experiment that LED was lighted by power generation of pushing piezoelectric element, for elementary school the fourth grade children. By the way, East Japan Railway Company formerly provided the demonstration of power generating floor at Tokyo station. Matsubara etc. (2014) combined floor vibration power generation into the learning contents of wood processing and programming. They developed the teaching material of “the wood floor which shines by power generation,” and “the duckboard which makes a sound,” based on that.

In above studies, it was intended that school children could understand easily power generation using piezoelectric element. Also showed that produced teaching material was devised on interface and output electric device. School children could perceive piezoelectric element by the teaching material, however, in their impression after lesson, they were conscious of negative aspects: the voltage of power generation was a few. The other side, Wakayama and Koyama (2015) glued piezoelectric element into bottom of plastic cup, and practiced the class using teaching material of power generation by voice vibration. It was the worthy of note that they devised the power generation which suppressed children's effort.

In this study, when School children have an experience which is power generation using piezoelectric element, we attempt that they understand the advantage: the stress and vibration can be changed to the voltage, but not disadvantage: the voltage of power generation is a few. Accordingly, this paper is intended as producing of Audio-Visual material in teaching a power generation using piezoelectric element. First step, through 5 experiments, we collected the data about the degree of generating voltage when a stress was added to piezoelectric element, for instructing to students. Second step, we edited video recording these experiments, and produced an Audio-Visual material.

FIRST STEP: TRIAL PRODUCTION AND EXPERIMENT

Full-wave rectifying circuit was adopted (figure 1). When a piezoelectric element part generates electricity by adding a stress, the voltage also generates to the reaction direction. Therefore, it is necessary for the voltage to rectify. Besides, Output time on one experiment, was increased by a capacitor. We intended that school children weren't conscious of negative aspects: the voltage of power generation was a few. Moreover, sound IC (integrated circuit) was used as loudspeaker, too.

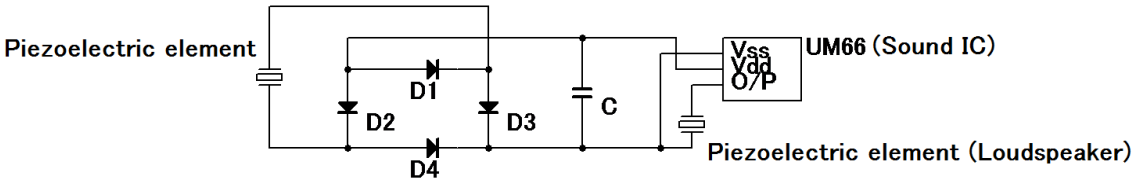


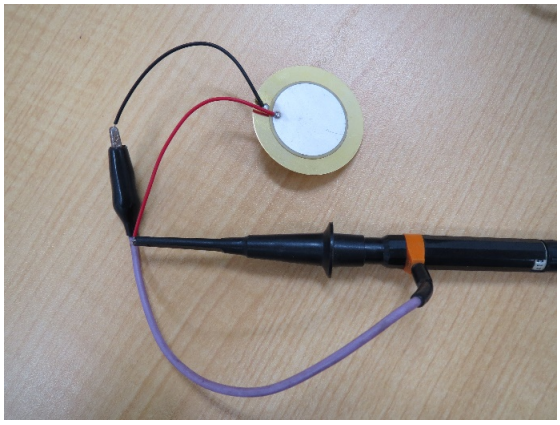
Figure 1. Full-wave rectifying circuit

Table 1 shows a design of the experiment. In first experiment, 4 persons added by hand bending, a stress to the piezoelectric element which connected with only oscilloscope (Picture 1), and the voltage was measured. In the second experiment, full-wave rectifying circuit using piezoelectric element, was built (Picture 2) and stored an electricity by the above hand bending. Then we measured the time electronic sound generated from sound IC (integrated circuit). In the third experiment, the experiment result of the second and the third were compared on same condition except the number of capacitors increased (Picture 3). In the fourth experiment, the experiment result of the third and the fourth were compared, on same condition except generating electricity method by a finger's tapping piezoelectric

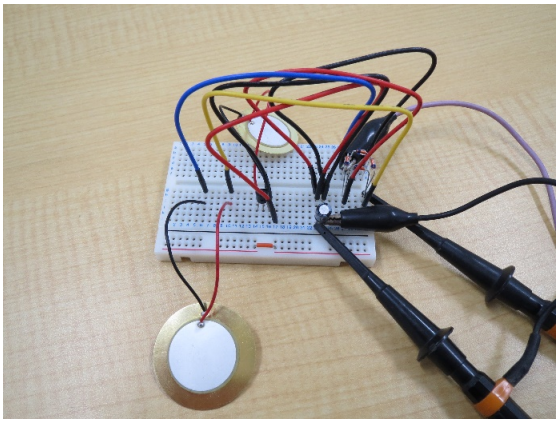
element. In the fifth experiment, the experiment result of the third and the fifth were compared on same condition, except that an output component was changed to an LED (Picture 4).

Table 1. A design of the experiment

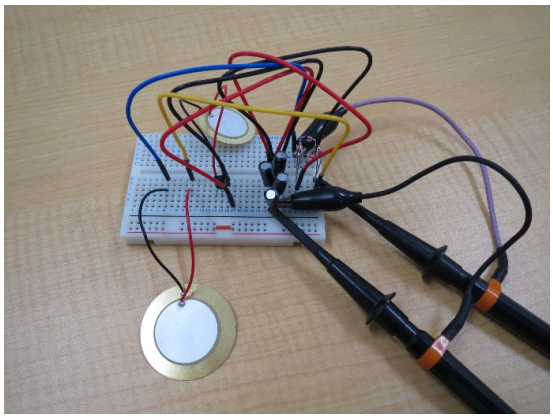
	Capacitor	Output component	Contents
First experiment	No	No	Four persons added by hand bending, a stress to the piezoelectric element which connected with only oscilloscope, and the voltage was measured.
Second experiment	100μF	Sound IC	Full-wave rectifying circuit using piezoelectric element, was built and stored an electricity by the above hand bending. Then we measured the time electronic sound generated from sound IC (integrated circuit).
Third experiment	400μF	Sound IC	The experiment result of the second and the third were compared on same condition except the number of capacitors increased.
Fourth experiment	400μF	Sound IC	The experiment result of the third and the fourth were compared, on same condition except generating electricity method by a finger's tapping piezoelectric element.
Fifth experiment	400μF	LED	The experiment result of the third and the fifth were compared on same condition, except that an output component was changed to an LED.



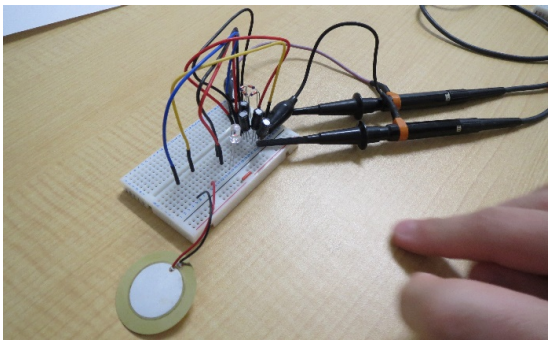
Picture 1. A piezoelectric element part, and the circuit in first experiment



Picture 2. The circuit in second experiment (a circuit of Figure 1)



Picture 3. The circuit in third experiment (the number of capacitors was increased to four)



Picture 4. The circuit in fifth experiment (an output component was changed to an LED)

RESULTS OF EXPERIMENTS

Components used in these experiments, were as follows. A piezoelectric element part (model number: LF-W35E29B) was a diameter of 35 millimeters, and was with lead wire. Diode (model number: 1S2076A) was produced by Renesas Electronics Corporation. Sound IC (model number: UM66T-01L) was produced by UNISONIC TECHNOLOGIES (UTC), and included three Christmas songs. LED (model number: OSR7CA5111A) was produced by OPTOSUPPLY ltd., and was red color, a diameter of 5 millimeters. Breadboard (model number: SAD-101) which was produced by Sunhayato corporation, was used for jointing of these components. In addition, oscilloscope (model number: V-212) was produced by HITACHI ltd.

In first experiment, a piezoelectric element part connected with only oscilloscope, and the voltage which generated by hand bending stress was measured. As mentioned above, in the first place, piezoelectric element is passive device which is bent by adding a voltage. The main usage is loud speaker. So there was no description about an amount of generating electricity in specification.

This measuring was participated by 4 persons: 3 graduate school students (A~C) and a teacher. The voltage was generated at the moment which participants added a stress to a piezoelectric element part. And a waveform was drawn intermittently at display of an oscilloscope. Because the voltage also generates to the reaction direction, an oscilloscope displayed both positive and negative direction. The following results of an experiment, in the order of positive/negative direction, were obtained: 0.30V and 0.40V by A, 0.30 and 0.38 by B, 0.32V and 0.34V by C, 0.28V and 0.34V by a teacher.

In second experiment, full-wave rectifying circuit using piezoelectric element, was built (Picture 1). The time which electronic sound generated from sound IC (model number: UM66T-01L) was measured after an electricity was stored in a capacitor. A piece of 100 μF capacitor was used. When a piezoelectric element part was bent by hand, output line rose from line of bottom on the display of an oscilloscope. At the time output line didn't rise no further, we read the numerical value of voltage as the maximum dose. As the results on storing an electricity, the time was 3 minutes, and maximum dose was 0.84V. In addition, as the result on using the maximum stored electricity, the time electronic sound generated from sound IC was 4 seconds.

In third experiment, the number of 100 μF capacitors was increased to 4. Besides that, the experiment of the second and the third were compared on same condition. A result of the time for storing electricity was 3 minutes as with result of the second experiment. An amount of the maximum stored electricity was 0.32V. In addition, as the result on using the maximum dose, the time electronic sound generated was 12 seconds.

In the fourth experiment, the experiment result of the third and the fourth were compared, on same condition except generating electricity method by a finger's tapping piezoelectric element part. The time

for storing electricity was 3 minutes as with the time of the third experiment. As a result, an amount of the maximum stored electricity was 0.20V, the time electronic sound generated was 5 seconds.

In the fifth experiment, the experiment result of the third and the fifth were compared on same condition, except that an output component was changed to an LED. The time of lighting up was 0.3 seconds.

SECOND STEP: PRODUCING OF AUDIO-VISUAL MATERIAL

We edited video recording these experiments, and produced an Audio-Visual material. The object of Audio-Visual material was that students didn't recognize the generated voltage to be little, when students learned piezoelectric element in technology education at junior high school. Table 2 shows the contents of Audio-Visual material in teaching. This was consisted of 12 chapters, and reproducing time was 4 minutes and 25 seconds. These began with "Title" and "Role of the electricity in our life," concluded with "Thinking time about electrical generating floor system from view point of technology." In "The electronic sound which generated in the experiment," viewers could hear the electronic sound generated from sound IC.

Table 2. The contents of Audio-Visual material in teaching

1. Title	7. A piezoelectric element part
2. Role of the electricity in our life	8. An electric circuit in the experiments
3. Electrical generating system learned in technology education at junior high school	9. The conditions of hand bending a stress to the piezoelectric element
4. Structure of generating electricity on thermal power plant etc.	10. The electronic sound which generated in the experiment
5. Generation of electricity by electromagnetic induction	11. Result of the experiment: the time for storing electricity was 3 minutes, and the time electronic sound generated was 12 seconds.
6. Introduction of electrical generating floor system	12. Thinking time about electrical generating floor system from view point of technology

The Audio-Visual material in teaching was evaluated by technology education teachers. Three teachers participated in the survey. They were working at junior high school in Kanagawa, Japan. In July 2020, they viewed the Audio-Visual material that was uploaded to a website, after that they answered the question items on a network: Microsoft Forms was used. The survey questionnaire items and answer formats were showed in Table 3.

In item number 1, all teachers answered that they understood very much about the contents of Audio-Visual material. In item number 2, all teachers answered that viewing time was appropriate very much. The Audio-Visual material received high evaluation on the contents and viewing time.

In item number 3, there wasn't a teacher who answered that he wasn't conscious of negative aspects: the voltage of power generation by a piezoelectric element part, was a few. One teacher answered that I was conscious of negative aspects relatively. However, 2 teachers answered "Uncertain." It was not far from the truth to say that the object of Audio-Visual material was achieved.

In item number 4, about good things, teachers answered that video explanation of structure of generating electricity was easy for students to understand. Also teachers answered that the video had better explained in detail about the experiment, as improvement things. In item number 5, all teachers answered that the Audio-Visual material can be utilized in technology and home economics education at junior high school. They thought that the video was effective for students to think deeply about technology of electricity generating.

According to the above results, it seems reasonable to suppose that validity of the Audio-Visual material in teaching was confirmed.

Table 3. Survey questionnaire items and answer formats

No.	Item	Answer formats
1.	Do you understand the contents of this Audio-Visual material in teaching a power generation using piezoelectric element?	Multiple-choice single response with five options: Understood very much; Understood relatively; Uncertain; It couldn't be understood a little; It couldn't be understood definitely.
2.	Was viewing time appropriate?	Multiple-choice single response with five options: Appropriate very much; Appropriate relatively; Uncertain; It wasn't appropriate a little; It wasn't appropriate definitely.
3.	Are you conscious of negative aspects: the voltage of power generation was a few?	Multiple-choice single response with five options: I wasn't conscious of negative aspects definitely; I wasn't conscious of negative aspects a little; Uncertain; I was conscious of negative aspects relatively; I was conscious of negative aspects very much.
4.	Please tell me good things and improvement things about this Audio-Visual material.	Free descriptive answer.
5.	Do you think this Audio-Visual material can be utilized in technology and home economics education at junior high school?	Free descriptive answer.

CONCLUSION

In this paper, we intended as producing of Audio-Visual material in teaching a power generation using piezoelectric element. First step, through 5 experiments, we collected the data about the degree of generating voltage when a stress was added to piezoelectric element, for instructing to students. We built full-wave rectifying circuit using piezoelectric element, and stored an electricity by the above hand bending. A result of the time for storing electricity was 3 minutes. In addition, as the result on using the maximum dose, the time electronic sound generated was 12 seconds. Second step, we edited video recording these experiments, and produced an Audio-Visual material. The object of Audio-Visual material was that students didn't recognize the generated voltage to be little, when students learned

piezoelectric element in technology education at junior high school. The Audio-Visual material in teaching was evaluated by technology education teachers. According to the results, it seems reasonable to suppose that validity of the Audio-Visual material in teaching was confirmed. In next study, we wish to practice the class using the Audio-Visual material, after integrating into technology education curriculum.

REFERENCES

Kikuchi, T., Onodera, K. (2011). Development of Instructional Materials on Vibration-powered Generator using Piezoelectric Devices. *Proceedings of convention on the Japan Society of Technology Education in Kyushu Branch.*, 19: 63-68

Kikuchi, T., Onodera, K. (2012). Development of Instructional Materials on Vibration-powered Generator using Piezoelectric Devices (2). *Proceedings of convention on the Japan Society of Technology Education in Kyushu Branch.*, 20: 135-140

Kikuchi, T., Gushi, Y., Onodera, K. (2013). Development of Instructional Materials on Vibration-powered Generator using Piezoelectric Devices (3). *Proceedings of convention on the Japan Society of Technology Education in Kyushu Branch.*, 21: 77-82

Hagita, Y. (2017). Relationships between voltage and the method of adding a stress on a piezoelectric element. *The journal of electrical engineers of japan.*, B 137(3), NL3_10-NL3_13

Masuda, Y., Echizen, M., Yamaguchi, H., Ohara, D., Saito, T. (2005). Design and evaluation of micropump using a piezoelectric element. *Proceedings of Tohoku-Section joint convention on institutes of electrical engineers in Japan.*, 2005(0): 34

Matsubara, Y., Murofushi, H., Jung, K. (2014) A Study of the Development of Teaching Material Using Vibration Power Generation. *Journal of the japan society of technology education.*, 56(1): 75-79

MEXT (Ministry of Education, Culture, Sports, Science and Technology) (2018). *Explanation of Course of Study for elementary school in Japan -The volume of Science education-.* Tokyo, Japan: Toyokan Publishing.

MEXT (Ministry of Education, Culture, Sports, Science and Technology) (2018). *Explanation of Course of Study for junior high school in Japan -The volume of Technology and Home economics education-.* Tokyo, Japan: KAIRYUDO Publishing.

Takahashi, Y. (2013). Comparative study on electric energy from a piezoelectric element and electromagnetic induction. *The journal of electrical engineers of japan.*, B 133(3), NL3_3-NL3_5

Wakayama, H., Koyama, H. (2015) Efficient circuit for educational vibration power generators and its class practice. *The journal of school education (published by Hyogo University of Teacher Education).*, 28: 39-43

The Possibility of Fostering Metacognitive Ability in Online Math Classes using the Balloon method

Komoto Haruhisa
komoto@kansai-u.ac.jp
Doctoral student
Kansai University
Takatsuki, Japan

Kurokami Haruo
Professor
Faculty of Informatics
Kansai University
Takatsuki, Japan

A set of interactive and simultaneous distance math classes were developed in a private elementary school in Osaka. The points of the classes was that multiple channels were established by using two tablet devices to communicate each other and share ideas, and that the Balloon method on Loilonote School was used to share ideas. Although the "awareness" among four types of meta-cognition were expected to gain, the result was not positive. This may be because of the difficulty of the problems. The factor of "grasping problems" among five factors of meta-cognition were significantly changed after all the classes. Totally speaking, the effect of the classes was not remarkable, it may be possible improve meta-cognition paying close attention to the difficulty of the problems.

Key words: interactive and simultaneous distance math classes, The Balloon method, Metacognitive Ability, grasping problems

INTRODUCTION

2020 started with Covid-19. Most schools in Japan were closed and students had to stay and learn at home. Distant classes are taken notice of to deliver educational contents.

Distant classes are classified into "on-demand type" and "concurrent and interactive type." During schools were closed, Ministry of Education opened a web site to support student in each year to learn at home and published useful links to learning resources and how to use them. (Mext, 2020). Ministry of Economy started a national undertaking named "the future school for never stopping learning" and introduced various learning resourced offered by companies in ICT education field (METI, 2020). These resources are on-demand type and just providing movies or tasks to follow independently. The effect of these resources can be, however, limited, because of weak interaction (Takeguchi, 2016; Tsuji, 2008).

This study is focussing on a set of distance math classes of the second type conducted in a private elementary school in Osaka and aims to examine the effect of it comparing to normal classes.

The math classes were promoting to use meta-cognitive strategy called "The Balloon method(Kameoka, 1990)" .Students jot down any ideas in speech bubbles produced by themselves around given math problems. This method were proved to promote meta-cognitive monitoring and meta-cognitive control (Kameoka, 2013).

Komoto(2019) revealed that there is no significant relation between the number of meta-cognition on math sentence problem and that of right answer, while the method can encourage students to summarize

the problems and focus on the points of them. When students shared ideas in speech bubbles, the method could be a tool to elaborate how to solve the problem collaboratively and learn how to have meta-cognition each other (Kameoka & Komoto, 2014).

PURPOSE

The purpose of this study is to develop a set of second type distance math classes and the effect of promoting meta-cognition in the classes. There are two hypothesis to be examined.

- The more students participate in the class, the more "awareness" of meta-cognition increase.
- Post level of meta-cognition will better than pre level of it.

METHODOLOGY

The classes held in May 2020 for 34 students in grade four and five in a private elementary school in Osaka.These students challenged some problems from past math olympic during school closure. They used Balloon method at the first time.

Each student at home prepared a device to communicate with teacher for the distance classes. They brought back an iPad from school. Namely, Each students could use two devices. iPad was used to run Loilonote School to deliver math problems, gather student's responses, share ideas and take notes. The other devices were used to run zoom to establish communication channel to join realtime remotel class. It was the first time for the students to use Loilonote School and zoom at the beginning. At this first stage, sometimes, parents supported students to operate these tools.

DEVELOPMENT OF

The distance classes consisted of eight classes. The first class focused on the purpose of the classes: to improve mathematical thinking. Students was informed to use the Balloon method to for the purpose. To think mathematically, coming up with ideas from numerical and graphical view points and integrate them logically. Students have to have meta-cognitive ability. Yoshino & Shimanuki(2019) reported that teaching meta-cognitive strategy improve students' meta-cognitive abilities as well as problem solving abilities in math. The Balloon method was used as a tool to visualize and promote meta-cognition in this study.

Basic flow of a class was form a to k as follows.

a. Teacher delivered math problem with Loilonote School.
b. Students jotted down any ideas in speech bubbles on a card in three minutes.
c. Students posted just one idea which seems to be most useful to solve the problem.
d. Teacher captured the list of ideas posted and deliver it to all students.
e. Each Student analyzed the ideas from others for three minutes.
f. Students shared and discussed the results of analysis in a class.
g. Each student made a plan to solve the problem.
h. Each student tried to solve the problem on a digital note for five minutes.
i. Students shared the note.
j. Students discussed each ones way of solving the problem in a group of three for five minutes.
k. Students discussed how to solve the problem in a class and wrapped up the concept of the problem.

Students produced various ideas on the phase from a to g in seven classes other than the first class as an orientation. 30 students joined all of these classes and the ideas produced by them were analyzed to reveal how many and what kind of meta-cognition were occurred.

The ideas were classified using newly developed framework referencing Komoto(2019) and Tajika(2016). The framework has four categories：checking, awareness, feeling and planning.

The factor scale of meta-cognition developed by Shimizu(1995) was used in pre and post survey. The scale consists of five factors: grasping problems, prudent problem solving, numeric sense, utilizing figures and tables, and exampling to simplify.

Table 1. Classifying framework of meta-cognition

checking: meta-cognition related to selecting any quantities and relationships among them.
awareness: meta-cognition related to summarizing or paraphrasing problem.
feeling: meta-cognition related to esteem the direction and result of solving problem instinctively.
planning: meta-cognition related to the direction and concrete way of solving problem.

RESULT

All ideas of students were classified using the framework. by the author and other researcher of speech bubbles. If classified differently, the meaning of the idea was discussed to determine the category, The process of problem solving and tendency of the other ideas of the student were took into consideration in the discussion. The matching rate was 74%.

Table 2 shows the number of ideas classified at each problem. Figure 1 shows the ratio of meta-cognition to all ideas and the ratio of right answer to all answer.

Table 2. The number of ideas classified at each problem

problem number	checking	awareness	feeling	planning	total
1	11	7	10	2	30
2	15	5	5	5	30
3	10	7	5	7	30
4	6	4	13	7	30
5	11	2	16	1	30
6	13	7	9	1	30
7	5	9	11	5	30

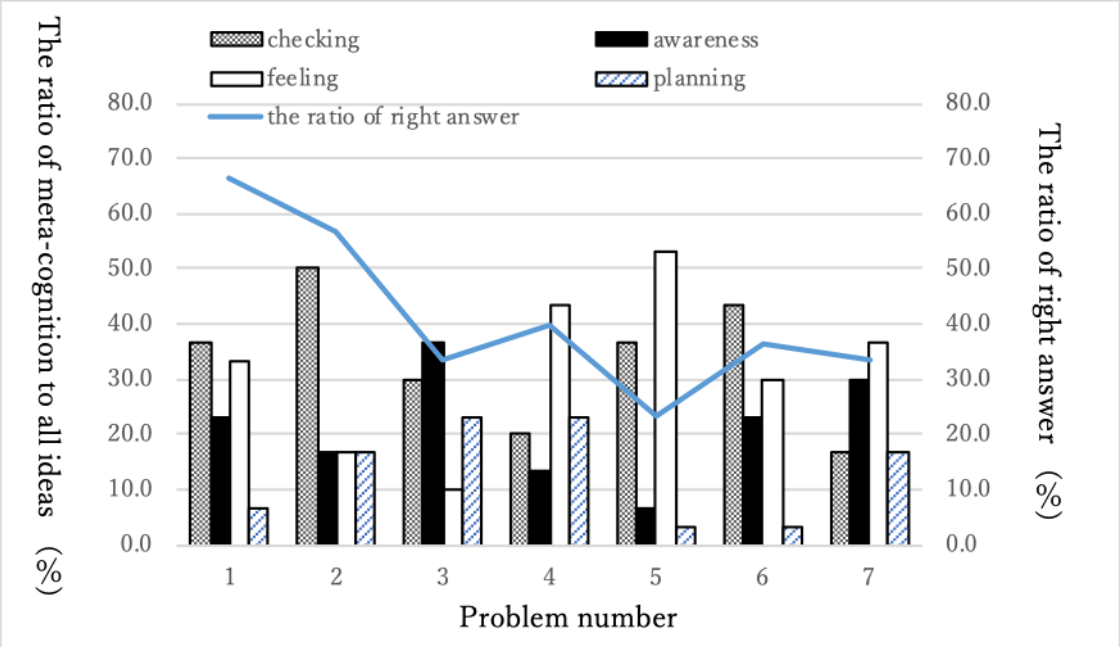


Figure 1.The ratio of meta-cognition to all ideas and the ratio of right answer to all answer

The rate of students who could solve the problems are not so high and under 40% in the classes after third one. The number of each meta-cognition is depends on the problem and no tendency were found.

Table 3 shows factor scores at pre and post survey. The results of t-test are also on the table. Only the first factor, grasping problems, among five factors had significant difference (t=2.20, p<.05). Students came to have positive attitudes in grasping problems after the classes.

Table 3.Factor scores at pre and post survey

factor	pre		post		t値
	M	*SD*	*M*	*SD*	
grasping problems	12.43	2.37	13.56	1.98	2.20*
prudent problem solving	19.70	3.17	20.88	2.91	1.67
numeric sense	6.32	1.03	6.53	1.39	7.33
utilizing figures and tables	6.07	1.44	6.06	1.11	0.02
exampling to simplify	5.86	1.55	6.28	1.63	1.14

DISCUSSION

The first hypothesis was not examined. The number of awareness emerged inconsistently. The difficulty of the problems may influenced the meta-cognition.

This result follows Veenman et al.(2014). The difficulty of the problems will disturb problem solving itself and it leads not to engage meta-cognition.

Though the problems with relatively high correct answer rate in math olympic were selected in this study, the average rate of correct answer of the students in this study was 41.1%. This may have disturbed the growth of awareness.

As for the number of feeling, it seems to have some relationship to the problem with low rate of correct answer. It may be said that coming across difficult problems, students can do nothing other than jot feeling down. This may be support the inference above.

The duration of the classes may be other cause of the result. The classes has just one week length. Other research on meta-cognition had three months-length in Kameoka(1990), 13 times in Okabe(2001), and one year in Komoto(2019). These research reported the gain in awareness in students' meta-cognition. The length was too short to get the growth of the awareness.

On the other hand, students felt usefulness of the idea sharing on line. There were some statements related to meta-cognition during solving problem.

"Reading ideas from friends makes me organize the problem and come up with a new idea. Learning with friends can deepen my learning."

"I would like to follow my friends who are organizing the problem or dividing into cases."

"I felt getting close to the right answer when thinking with friends. It was not being taught by friends but learning other approach to the problem. It is important to learn with friends because I can broaden my approach."

The second hypothesis was partially proved. As for the first factor named grasping problems, the mean of factor score at post-test was significantly higher than that of pre-test. Indeed, students reflected as follows.

"It was so difficult to jot down ideas that I could not fill more than one speech bubble. But now I became to able to complete three bubbles."

"I could get an ability to understand math problems and organize ideas in my mind."
"I learned to come up with ideas immediately when I read a problem."
"It is important to problems repeatedly, because easy problems as well as difficult ones conceal a clue leading to correct answer. I want to be able to solve problems with various way."

All of these refer to grasping problems. It will indicate that students felt the power of meta-cognitive strategies and acquire them.

It is difficult for teachers to grasp the conditions of students in distance classes. It is also difficult for students to share ideas in the situation. Establishing two channels for idea sharing and communication will solve the problem. Given the situation, teacher can focus not only to deliver how to solve problems but also to make students produce their own idea and share them. Visualizing function of distance learning system like Loilonote School will be a good tool to encourage meta-cognitive activities. Although the effect of the Balloon method on distance classes was limited, it is possible to foster meta-cognition by continuing distance classes with the Balloon method paying close attention to the difficulty of the problems.

REFERENCES

Kameoka,M.(1990)．"Sansukakyouiku niokeru 「hukidashiho」no riron to tenkai"[Theory and development of "the balloon method" in arithmetic education]．*Mathematics education research*,20:1-18(in Japanese)

Kameoka,M.(2013)．A study note on "Fukidashi Method" as a metacognitive strategy in arithmetic-from the perspective of metacognitive monitoring-．*Kyoto bunkyo university department of psychology for child education and community faculty of clinical psychology*，6:191-197(in Japanese)

Kameoka,M.,Komoto,H.（2014）．*"Kodomo no shiko ga 「mieru！」「wakaru!」sansukajyugyo dezain 「hukidasi ho」"[Children's thoughts are "visible!" "understand!" arithmetic class design "hukidashi method"]*．Toyokan publishing co ltd(in Japanese)

Komoto,H.(2019)．Effective metacognitive strategies for solving mathematical word problems-Consideration of on-line metacognition comprehended using the balloon method-．Journal of japan society of mathematical education，113:3-12(in Japanese)

METI (2020) ."The future school for never stopping learning". https://www.learning-innovation.go.jp/covid_19/ (accessed 2020.07.25)

MEXT (2020) .Content portal site for learning support during temporary leave (child learning support site).https://www.mext.go.jp/a_menu/ikusei/gakusyushien/index_00001.htm(accessed 2020.07.25)

Shimizu,N.(1995)A Study on stretegic ability in mathematical problem solving-The development of the questionnaire-type instrument for measuring metacognitive ability-.*Japan academic society of mathmatics education*,1:101-108(in Japanese)

Tajika,H.(2016)Activating a metacognitive strategy during children's math problem solving．Bulletin of kobe shinwa women's university graduate school of literature，12:1-10(in Japanese)

Takeguchi,Y.(2016)."Kyouikuriyo wo mokuteki toshita doga no bunseki to seisaku"[Analysis and production of videos for educational use].J*ournal of information education, Naruto University of education* ,13;23-29(in Japanese)

Tsuji,Y.(2008).A review for applying audio-visual materials on lesson: Management of materials and copyrights．*Otaru university of commerce, humanities*，115:175-194.(in Japanese)

Veenman，M. V. J.，Bavelaar，L.，De Wolf，L.，& Van Haaren，M. G. P.(2014)．The on-line assessment of metacognitive skills in a computerized learning environment. *Learning and individual differences*．29．123-130．

Yoshino,I.,Shimanuki,S.(2019).Promoting students' metacognition in elementary school mathematics classes: Directing students' attention to metacognition as "a teacher in your brain" and metacognitive training．*Japanese journal of educational psychology*.67(4):343-356(in Japanese)

Development and Evaluation of 360-degree VR Training System for English Public Speaking: Cross-analysis with Participants' Proficiency

Miharu Fuyuno
m-fuyuno@design.kyushu-u.ac.jp
Assistant Professor
Kyushu University
Fukuoka, Japan

This paper discusses the development and effect verification experiment of a 360-degree virtual reality training system on English public speaking for English as a Foreign Language (EFL) learners. The globalization of businesses and education has created increasing opportunities for delivering English public speaking training to EFL learners. Public speaking is a major trigger of social fears, and there is no fully sufficient evidence-based teaching methods and material for English public speaking and delivery (e.g. speech speed and eye contact). This study approaches the issue by developing immersive virtual training content for public speaking in English. The system was designed with results from multimodal corpus-based data analysis of effective public speaking performances in terms of eye contact, speech rate, and speaker's nervousness. It offers a 360-degree immersive virtual venue and virtual audience for learners to feel as if they are in an authentic public speaking environment. A survey of Japanese EFL learners (junior and senior high school students) was carried out to investigate the potential effect of the system on participants' English proficiency and self-confidence levels for public speaking. 32 Japanese EFL learners partook in the Virtual Reality (VR) experiment and answered the experienced the questionnaire sheet. We cross-analyzed the results with participants' English proficiencies and confidence levels for speaking in public. The cross-analyzed results showed that: (i) the potential training effect was high regardless of participants' English proficiencies, and (ii) the potential training effect was high regardless of participants' confidence level for speaking in public.

Key words: Virtual Reality (VR), Public Speaking, Material Development, ELT

INTRODUCTION

The globalization of business and education has created increasing opportunities for delivering English public speaking training to EFL (English as a Foreign Language) learners (Fuyuno, Yamashita, Kawase & Nakajima, 2014; Fuyuno, 2015; Fuyuno, Yamashita & Nakajima, 2016). The need for effective public speaking education has increased alongside the need for English public speaking skills. For example, the Common European Framework of Reference for Languages (CEFR) has set presentations and speeches as major production skills (Council of Europe, 2018). In Japan, where English is taught as a foreign language in official school curricula from primary to higher education, the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) revised national Courses of Study for official school curricula in 2017. The new guidelines for English modules in primary and secondary education set "speech/presentation" as one of the major skill objectives. They also emphasize the development of oral communication skills and established new modules that specialize in strengthening productive speaking skills (MEXT, 2019).

These shifts reflect the increasing need for public speaking skills although teaching and learning effective public speaking in English classrooms are not easy. Studies in psychology have shown that

public speaking is a prime trigger of social fear. Kessler, Stein and Berglund (1998) aver that many people, regardless of nationality or generation, feel anxious about public speaking. Furthermore, teaching public speaking skills is hampered by insufficient methods and materials for delivery. Many textbooks focus more on content organization, and less on descriptions of delivery skills.

In addition, time constraints make teaching and letting students sufficiently practice public speaking skills in ELT (English Language Teaching) classrooms challenging. Teachers may resolve this issue by setting delivery practice and rehearsals as homework. However, this will translate to students practicing alone and not in an authentic environment where they can get used to the anxiety and tension felt in a real production.

This study approaches the above issues by using a virtual reality (VR) training system to teach public speaking in English. The system was designed for novice public speakers to practice speeches and presentations in a virtual venue with a virtual audience. The authors developed the system based on our previous analysis of public speaking performance (Fuyuno, et al., 2014; 2016; Fuyuno, Komiya & Saitoh, 2018; Fuyuno & Yamashita, 2020).

Virtual Reality Technology and Public Speaking

Previous studies have examined the effect of VR technology on speech production. Slater, Pertaub and Steed (1999) analyzed how the actions of a virtual audience affect speakers' performance. They found that when the speakers view the audience as interested in their speech, they become less anxious and evaluate their presentation positively. Hartanto et al. (2014) developed VR content to treat social phobia. They found that the existence of avatars, even if they are CG (computer graphics) characters, significantly increased nervousness in the speakers.

Fuyuno and Yamada (2016) analyzed the effect of a virtual audience on speakers in an EFL pedagogy context. They asked EFL learners to speak in English in front of two types of virtual audiences: a CG audience and a live-action movie audience. They also implemented a non-audience condition as a control condition. The results showed that both virtual audience versions, especially the live-action movie audience, significantly increased subjective nervousness in the speakers. We developed a VR training system for public speaking based on the results of these studies (Fuyuno & Yamashita, 2020).

Fuyuno and Yamashita (2020) found that the system prototype received high ratings for positive practice effects and usability by EFL learners. However, the participants in the survey were secondary school and university students, with varying English proficiency and majors. During the development process, the VR training system was targeted at learners with little experience with and confidence in public speaking. This study analyzed the results of a survey of 32 secondary school students to assess how learners' English proficiency and self-confidence levels in public speaking affect positive practice effects. There are two research questions:

RQ1: Do participants' English proficiency affect the positive practice effect?

RQ2: Do participants' self-confidence levels in public speaking affect the positive practice effect?

This study cross-analyzed participants' profiles and their answers to a survey questionnaire. The details of these are discussed in the next section.

RESEARCH DESIGN & METHODS

VR Speech Training System

The VR speech training system is a VR application with 360-degree movie content (patent applied: 2017-077706, 2017-185257). It was designed with a head-mounted display Oculus Rift (Fig. 1). The main parts were produced with 3D game engine Unity. The system offers two types of virtual venues and audiences—CG and live-action movie—for practicing speeches and presentations (Fig. 2, Fig. 3). The CG content were produced on the MAYA platform.

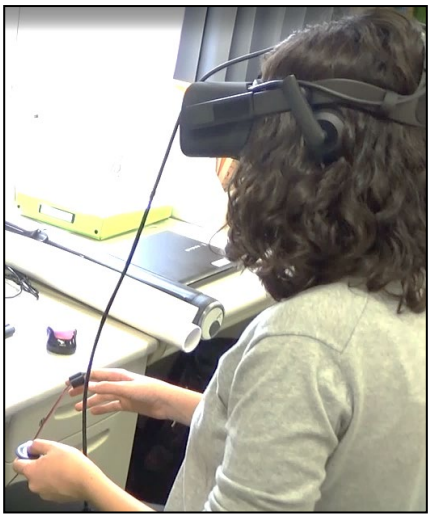


Fig.1: User wearing Oculus Rift (head mounted display) and a heart-rate sensor

Fig. 2: Screenshot of an option selection menu

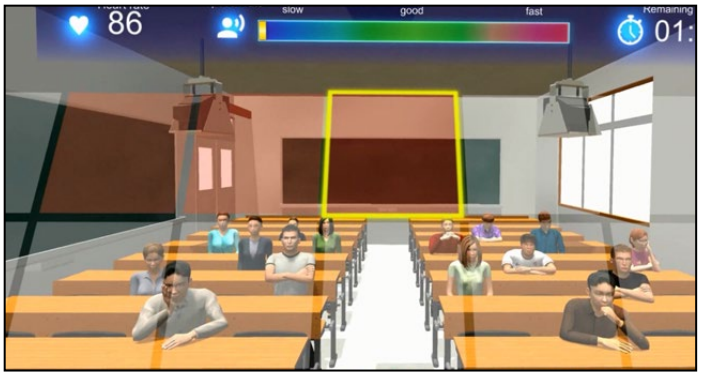


Fig.3: Screenshot of the CG practice mode from the VR application

The system provides automatic evaluation and feedback on the users' speech speed, eye contact movements, and anxiety.

Participants

32 Japanese EFL learners (20 females and 12 males) participated in the survey. They are students at two private secondary schools. The two schools are both combined junior and senior high schools. The participants' English proficiency were EIKEN 3 to pre-1 grades. EIKEN is one of the major English proficiency examinations in Japan, and it has the highest number of Japanese junior and senior high school students' examinees (cf. https://www.eiken.or.jp/eiken/en/). The survey was conducted during non-lecture hours (extra hours). During the survey, we explained the ethical considerations to the participants and obtained a consent form. The participants were told: (i) the survey has nothing to do with their grades; (ii) participation in the survey is voluntary; (iii) there is no disadvantage in refusing to participate or cancelling; and (iv) they would remain anonymous.

Method

We conducted a monitor survey of participants using the VR system. A survey questionnaire that consisted of items of 5-point Likert scales, a free comment section, and a face sheet was used for evaluation. The questionnaire asked about nervousness, positive practice effect, enjoyment of the practice, the usability of the user interface, and if the participants would like to continue using the VR system if their schools have it. The specific questions are shown in Figure 4.

I didn't feel nervous	1	2	3	4	5	I felt nervous
It didn't feel effective	1	2	3	4	5	It felt effective
Practice was not enjoyable	1	2	3	4	5	Practice was enjoyable
UI was not easy to use	1	2	3	4	5	UI was easy to use
I don't want use this more	1	2	3	4	5	I want to use this more

Fig 4: Items on the questionnaire

The face sheet contained questions about the participants' school grade, EIKEN grade (English proficiency), and a 5-point Likert scale to measure their self-confidence level for public speaking.

The survey was conducted one by one for each participant. The experimenter first explained how to use the hardware and VR application. After the participants had successfully worn the equipment and confirmed how to operate the application, they started the application and experienced CG practice mode for two minutes. They were asked to introduce themselves in English. The survey time was about 30 minutes per participant.

RESULTS

To answer RQ1—do participants' English proficiency affect the positive practice effect?—we carried out a cross-analysis of participants' proficiency and their answers to the questionnaire. The participants were divided into two groups depending on their EIKEN grades: HIGH—17 participants made up of EIKEN Grade 3 and Pre-2—, and LOW—15 participants made up of EIKEN Grade 2 and Pre-1. Their Likert scale responses to the positive effect of the VR system are shown in Table 1.

Table 1. Positive practice effect of the VR material: English proficiency groups

English Proficiency: HIGH	English Proficiency: LOW
4	5
5	5
5	5
5	4
5	4
5	5
5	5
4	4
4	5
5	5
3	5
4	3
5	4
5	3
5	3
5	
4	
Average: 4.59 (SD: 0.61)	Average: 4.33 (SD: 0.82)

We performed a t-test on the data and found that there is no significant difference at significance level of .05 between the groups regarding the positive effect of the VR speech training system: HIGH group (M = 4.59, SD = 0.61) and LOW group (M = 4.33, SD = 0.82); t (30) = 1.002, p < 0.32. The average scores from both groups showed high (average over 4) expectancy on the practice effect.

To answer RQ2—do participants' self-confidence levels in public speaking affect the positive practice effect?—, we carried out a cross-analysis of participants' self-confidence and their answers to the questionnaire. The participants were divided into three groups depending on how they rated their self-confidence when speaking in public on the 5-point Likert scale. We labeled participants who picked 1-2 as the LOW group(14), participants who picked 3 as the MIDDLE group(11), and participants who picked 4-5 as the HIGH group(7). Their ratings of the positive effect of the VR system are shown in Table 2.

Table 2. Positive practice effect of the VR material: Self-confidence groups

Self-confidence: HIGH	Self-confidence: MIDDLE	Self-confidence: LOW
5	4	4
5	5	4
3	5	4
5	4	5
5	5	4
5	4	5
5	5	3
	3	5
	4	5
	3	5
	4	5
		5
		5
		5
Average: 4.71 (Standard deviation: 0.65)	Average: 4.18 (Standard deviation: 0.75)	Average: 4.57 (Standard deviation: 0.76)

An ANOVA test was performed on the data. We found that there is no significant difference at significance level of .05 between the groups regarding the positive effect of the VR speech training system: HIGH group (M = 4.71, SD = 0.65), MIDDLE group (M = 4.18, SD = 0.75), and LOW group (M = 4.57, SD = 0.76); [F (2, 29) = 2.40, p = 0.108]. It was noted that the average scores from all the groups showed high (average over 4) expectancy on the practice effect.

DISCUSSION

The results of the cross-analysis showed that the positive practice effect of the VR training system was rated high regardless of the participants' English proficiency levels and self-confidence in public speaking. The result was unexpected as the VR system was designed for learners with little confidence on public speaking. This can be attributed to the HIGH group having self-practice a lot, thus realize the importance of practice, and can positively evaluate the usability of the system. We would like to survey participants with different profiles, such as students with exceedingly high English proficiencies and business people who have high experience in public speaking. This will help us adjust the VR system to be a useful application for users with varying English language and self-confidence levels.

ACKNOWLEDGMENT

This work was supported by JSPS KAKENHI Grant Number 16H03079 (Grant-in-Aid for Scientific Research (B)), 15K12416 (Grant-in-Aid for Challenging Research (Exploratory)), the Kyushu University Gap Fund program (the 1st generation), the Gap Fund Program of the Kyushu Industrial Advancement Center, and the 2019 Kyushu University Research Activities Support Grant. The authors thank the teachers and students of the private schools who kindly participated in the study.

REFERENCES

Council of Europe. (2018). *Common European framework of reference for languages: Learning, teaching, assessment- companion volume with new descriptors.* Strasbourg: Council of Europe.

Fuyuno, M., Yamashita, Y., Kawase, Y., & Nakajima, Y. (2014). Analyzing speech pauses and facial movement patterns in multimodal public-speaking data of EFL learners. *Learner Corpus Studies in Asia and the World, 2,* 237-251.

Fuyuno, M. (2015). Needs analysis of practical English skills in global business: Towards the development of Japanese global human resource [in Japanese]. *Studies in English Teaching and Learning in East Asia, 5*, 13-27.

Fuyuno, M. & Yamada, Y. (2016). Development and evaluation of virtual audience movies for public speaking training [in Japanese]. *Proceedings for Annual Conference of JAEMS 2016*, 30–31.

Fuyuno, M., Yamashita, Y., & Nakajima, Y. (2016). Multimodal corpora of English public speaking by Asian learners: Analyses on speech rate, pause and head gesture. In F. A. Almeida, I. O. Barrera, E. Q. Toledo, & M. S. Cuervo (eds.), Input a Word, Analyze the World: Selected Approaches to Corpus Linguistics. Newcastle upon Tyne: Cambridge Scholars Publishing.

Fuyuno, M., Komiya, R., & Saitoh, T. (2018). Multimodal analysis of public speaking performance by EFL learners: Applying deep learning to understanding how successful speakers use facial movement, *The Asian Journal of Applied Linguistics, 5* (1), 117-129.

Fuyuno, M. & Yamashita, Y. (2020). Development of 360-degree Immersive Virtual Reality Train ing System for English Public Speaking [in Japanese], *Let-Ko Bulletin, 20*, 11-25.

Hartanto, D., Kampmann, IL., Morina, N., Emmelkamp, PGM., Neerincx, MA., and Brinkman, W. P. (2014). Controlling social stress in virtual reality environments. *PLOS ONE 9*(3): e92804. https://doi.org/10.1371/journal.pone.0092804.

Kessler, R. C., Stein, M. B., & Berglund, P. (1998). Social phobia subtypes in the National Comorbidity Survey. *American Journal of Psychiatry, 155,* 613-619.

The Ministry of Education, Culture, Sports, Science and Technology. (2019). *Handbook of the Courses of Study: for High school English* [in Japanese]. Tokyo: Kairyudo.

Slater, M., Pertaub, D. P., & Steed, A. (1999). Public speaking in virtual reality: Facing an audience of avatars. *IEEE Computer Graphics and Applications, 19*(2), 6-9.

Zoom In (but Fasten Your Seatbelt)

Tamara Fudge
TFudge@purdueglobal.edu
Professor
Purdue University Global
Indianapolis, USA

Lynne Williams
Lwilliams4@purdueglobal.edu
Professor
Purdue University Global
Indianapolis, USA

The year 2020 has presented many challenges, not the least of which is the COVID-19 pandemic forcing schools to temporarily close for the spring semester. Along with the instant need for students to obtain computers and internet service was the faculty's hasty retooling of content delivery and assessment into an online format. Video tools – especially Zoom – became the method of choice for this unscripted and unexpected online learning due to the relative ease of use, similarity to face-to-face lecturing, and the fact that the basic service is free. Unfortunately, Zoom was not ready for the onslaught, and security issues and other problems were discovered; over the course of many weeks, the owners of Zoom were forced to make changes as each new problem emerged. The result of the research and analysis points to the use of Zoom and other video tools as an adequate stop-gap measure for online learning, but with the caveat that faculty need to be aware of the flaws and understand how to best mitigate them.

Key words: teleconferencing, webinar, online teaching, online security, Zoom

INTRODUCTION

The Covid-19 pandemic has radically changed the K12 - College teaching landscape overnight. Countless classes that were traditionally taught face to face have suddenly had to retool for the online environment with very little guidance from administrators. The most obvious method for providing a simulated face to face experience appeared to be some sort of video teleconferencing application such as Skype, Google Hangouts, or Zoom. However, in the rush to get classes online, there has not been adequate planning surrounding this shift, particularly regarding security.

Zoom has emerged as the teleconferencing tool of choice, but not necessarily predicated on any practical considerations. Teachers who have not taught online previously may have difficulty using the video tool for a variety of reasons such as device incompatibility, slow broadband, and general unfamiliarity with the online environment. Students may also only have access to slow (or no) broadband as well as a variety of technical issues such as audio lag, freezing, or jitter. In addition, Zoom has suffered from a host of security problems including Zoombombing, privacy issues, and a lack of data encryption.

The issues related to rapidly taking a face to face class online need to be revealed, specifically those involving Zoom as an online teaching tool.

RESEARCH DESIGN AND METHODS

Much information has been shared online since the pandemic quarantine precipitated this problem; secondary data analysis and archival study are the primary method for this research, with some historical

background regarding video conferencing. Anecdotal information was gathered from news sites and other sources to illustrate problems and solutions. Lastly, some observations are made by direct experimentation with the video tools in question.

BACKGROUND: THE PANIC OF MARCH 2020

In March of 2020, traditional K-12 and college education in the United States was caught by surprise by the Coronavirus pandemic. Face-to-face contact was determined impossible due to the obvious physical threat of a dreaded and largely unknown disease. Two main problems immediately surfaced: some students did not have the technology necessary to get online, and the teachers lacked time, tools, and training. The focus here is the latter.

While online programs were already set up for content delivery using sophisticated Learning Management Systems and organized curriculum guidelines and methods, the traditional classroom teacher simply was not trained as an online curriculum designer and multimedia developer. Despite premium tools often being unavailable and administrations largely clueless to provide guidance, teachers had to forge ways to continue instruction by "going online."

For many, this lack of direction – and lack of time – meant the format chosen was simply to "replicate their face-to-face courses online" (Lang, 2020, para. 10). The most logical first response, then, was to try to save the live lecture-style format and use a video tool to reach their students.

The use of video for educational purposes is far from being new. Television was employed as an educational medium as early as 1934 at the University of Iowa (Sleator, 2010). Coastline Community College, the first non-traditional school that actually had no campus of its own, used television in 1976 as one of its methods, transmitting courses through their local Public Broadcast Station (Luskin, 1976). Closed-circuit transmissions were used in that decade to connect multiple rooms of students in a traditional university to the one professor's live lecture (Fudge, 2018).

TOOL CHOICES

Not all video tools are useful for the teaching situation. There are some live meeting applications such as Cisco WebEx and Adobe Connect, but these require payment, which would not have been budgeted by school boards or affordable for the teachers themselves. Free tools would be most logical for this quick transition.

Skype is free but limits attendees to 50, which is difficult for large lecture classes; Google Hangouts only allow 25 people; FaceTime requires an Apple device; Microsoft Teams is gaining in popularity but requires downloading of software, which may be prohibitive for some users (Paul, 2020).

Quickly, Zoom became the tool of choice for completing the spring semester (Paul, 2020). Publicity, ease of use, and the fact that it is free likely aided in its popularity.

TO BE EXPECTED

When using a new online tool, there are some issues that can be expected, including an emotional response. Considine (2020) noted that college faculty who had never taught online reported feeling intimidated, and "students need a bit of curiosity and enthusiasm to even enter the online space" (p. 22).

Some technical issues experienced with Zoom in particular could also be expected. Teachers and students alike might have device issues, broadband problems, or lack of technical understanding. Additionally, technical glitches such as freezing, audio delay, and outages occurred.

It was the *unexpected* issues that provided cause for concern.

ZOOM'S UNEXPECTED ISSUES

Notably, Zoom's original purpose was not for online schooling or the widespread deployment of the application. Lorenz (2020) explains "the platform was built as an enterprise technology tool, not a consumer social tool. As such, the company was not prepared to moderate user behavior as other social networks do" (para. 14).

There were many corrections to make over the first few months of the pandemic. Three complications are especially worthy of exploration: Zoombombing, deepfakes, and the use of gathered data.

Zoombombing

Defined: Someone attending a Zoom session who has not been invited, with the potential for overt disruption (Krebs, 2020).

In the first few months of quickly-designed online learning, many Zoom sessions were held without requiring passwords; this caused some meetings to be disrupted by unwanted individuals and "an alert by the FBI on how to secure meetings against eavesdroppers and mischief-makers" (Krebs, 2020, para. 5). Zoombombing trolls were found to occasionally inject hostile attacks with white supremacist language or pornography (Krolik & Singer, 2020), and plans for an anti-Semitic attack on a Philadelphia Jewish school by 8chan was exposed in early April (Hodge, 2020).

With meeting IDs of only 9-11 characters in length, hacking simply was all too possible, and Zoom finally took the initiative to set all new meetings by default to requiring a password (Krebs, 2020). Even after better security measures were constructed, Oklahoma City University's early May graduation ceremony was hacked with racist content (Wagenseil, 2020).

Passwords alone do not provide full security, of course. In early April, hacking tools such as zWarDial successfully infiltrated 100 meetings in an hour (Krebs, 2020). There is also a troubling setting that allows attendees to share their screens without first asking the host for permission (Lorenz, 2020).

Deepfakes

Defined: The imposition of someone else's face on a different person's body in video format using Artificial Intelligence algorithms (Gerstner, 2020). Audio might well be added or altered to accomplish the perpetrator's goals (Greengard, 2020).

Ethical issues arise from this capability. A sophisticated version of this technology, CGI (Computer-Generated Imagery), is sometimes used in Hollywood movies. One well-known example is the inclusion of Peter Cushing "acting" in the 2016 movie Rogue One: A Star Wars Story despite his passing years before in 1994. The ethics of using the likeness of an actor after his or her death is questioned, and licensing for posthumous activity may have to be forthcoming to protect an estate (Hardawar, 2016).

While not on a Hollywood production level, Zoom has the potential to cause harm. Applications such as Avatarify allow a Zoom participant to exchange someone else's face – such as that of a famous person – for the user's own (Cole, 2020). While it takes some technical knowhow to accomplish this task, the code is freely available and the result is a "neat trick" that would be distracting at best (Cole, 2020, para. 6).

More importantly, Zoom offers video that can be used to attack any other person also in attendance, whether it is the teacher, a guest speaker, or another student. Someone who wishes to create a deepfake in a program such as FakeApp just needs a video of the person who is to be impersonated (Gerstner, 2020); Zoom offers this opportunity, and there are many video capture tools available. A Zoom

session's captured video could be used in pornographic scenes, false news reports, and other videos with the purpose to assassinate the victim's character (Greengard, 2020)

Whether a video is real or a fake is not always easy to determine, but there are some new detection systems that can often analyze facial movements, lighting, and other elements (Toews, 2020).

Gerstner (2020) explains that not only can a deepfake steal intellectual property and "personality rights," it also can invite legal charges of public defamation of character or emotional distress, the latter which can be served through a tort called IIED: Intentional Infliction of Emotional Distress. However, by the time a fake video has been disseminated, detection tools and lawsuits will not erase the damage done to the victim.

Data Tracking

Defined: The collection and analysis of data collected by an application, sometimes through indirect means and typically meant to assist a company in improving products and services for the customer (Freedman, 2020).

Data tracking is common and allows companies to serve their customers better. However, sometimes the data collected is sold or shared with other companies (Freedman, 2020). There are regulations on data capture, storage, and sharing, but it is possible that companies may violate such compliance before they adapt to ever-changing laws (Freedman, 2020).

A privacy policy is a document shared with customers that explains how data is collected, for what purpose the data is intended, and if the data will be shared. Zoom's privacy policy can be reviewed at https://zoom.us/privacy. It was updated in late March and then again in July 2020.

According to Wagenseil (2020), Skype, Webex, Microsoft Teams, Google Hangouts, and other such applications have "questionable privacy policies," as does Zoom ("Friday, May 1"). Even with a written policy, there have been many concerns during the time in question, some of which are shared here.

In late March, it was noticed that Zoom attendees who subscribed to the LinkedIn Sales Navigator tool had been granted access to other people's LinkedIn profile data upon entering a Zoom session (Krolik & Singer, 2020).

Yet another feature affecting those who logged in on their iPhones was found to send user data to Facebook (Krolik & Singer, 2020). Zoom, whose home offices are in California, was summoned with a class-action lawsuit for violations of the state's Data Protection laws for this infraction; other lawsuits were also filed in the weeks following for other problems (Hodge, 2020).

Zoom also had an attendee attention tracking feature. While this may at first seem like it would be helpful to ensure that students pay attention (the teacher is notified if the student clicks outside of the Zoom window and remains there for more than 30 seconds), it should be noted that not all learning is visual; the audio surely would be of value and would not necessitate full pictorial attention (Koch, 2020).

By mid-April, information about a half million accounts had been sold by hackers (Hodge, 2020). By the end of the month, more security issues flowed. One bug allowed hackers access to webcams and microphones, another routed calls through China, a cloud exploit was found, the Federal Trade Commission was asked to investigate, foreign surveillance was discovered to be possible, a particular hack could record a meeting without participants' knowledge, and "bug bounty hunters" started looking for problems they could sell to others (Hodge, 2020).

As late as July 10th there were still problems, such as a bug that would let a hacker commandeer a computer using Windows 7 or earlier versions (Wagenseil, 2020).

Some school districts responded by banning the use of Zoom, Germany warned their citizenry about the dangers, Singapore banned it, Singapore warned their citizens, the U.S. Senate was told to avoid it, and the Pentagon restricted its use; New York City originally banned Zoom but rescinded the ban in early May (Hodge, 2020).

To be fair, Zoom worked to correct issues as they were brought to them. They started offering end-to-end encryption for all users in mid-June, for example, and are working with the New York Attorney General to clean up other security matters (Wagenseil, 2020). They also added a "Report User" button that can be used in a live session (Hodge, 2020). However, these are reactive rather than proactive, so there are still fears that other problems may arise.

OTHER OBSERVATIONS

As previously noted, Zoom was not originally designed as an educational seminar tool, so many of the settings and administrative tools are heavily geared toward business users rather than teachers or instructors. This does not necessarily mean that Zoom cannot be used effectively in a classroom setting, simply that the hosts need to familiarize themselves with the application and be aware of the various settings, particularly in the free version which does not include most of the more powerful administrative tools. For those users who are not particularly technically savvy, this can present a fairly steep learning curve.

The free version gives the host a limited set of tools, including the ability to host meetings. Meetings are geared toward collaborative online gatherings where the participants share information of various types. A Zoom meeting allows the host to mute participants but all participants can be given the ability to unmute their audio, although this may not be desirable in a classroom setting. Participants in meetings can also share video without permission from the host. As of March 26th, 2020, the free version of Zoom meetings will default automatically to screen sharing for "Only Host," which is the safest option to avoid disruption. Free version meetings allow up to 100 participants. In-meeting chat is available in free meetings as are "meeting reactions" and "nonverbal feedback" which are similar to emojis. Closed captioning and recordings are also available in the free version.

When starting a meeting, hosts should check the Security settings (bottom of Zoom Meeting screen) to ensure that they have selected the participant behaviors that they wish to allow; otherwise participants will be able to share their screens and unmute their microphones at will. The Share Screen settings should also be checked and generally set to "Host Only."

Zoom also offers Webinars which differ from Meetings in that Webinars are designed for a lecture style presentation rather than collaboration. Webinars are likely to be the more comfortable option for educators as they give the host much more control over participant behavior. However, webinars are only available with the paid option.

CONCLUSION

It needs to be said that starting in March 2020, Zoom and other video tools served as a stop-gap measure for online learning, and that the unpreparedness of both faculty and their administrations to deal with the quick transition to "teaching online" has had some consequences. Wagenseil (2020) insists that despite the problems, the corrections made by Zoom in the last few months mean it should be safe for use except for discussing trade secrets or personal information such as a health history.

Two sources in particular provided detailed chronologies of Zoom use in early- to mid-2020 and provided some excellent recommendations, as did security expert Brian Krebs:

- Wagenseil (2020) strongly recommends that Zoom be used within a web browser rather than the downloaded software, as the web browser will include the most up-to-date improvements. He also suggested that Zoom session hosts change the default file name for recorded sessions and to remember that anything in a video meeting may be recorded.

- Koch (2020) recommends that attendees avoid logging in with Google mail or Facebook so that the data therein is not shared.
- Krebs (2020) recommends disabling the feature that allows participants to enter the Zoom room before the teacher/host arrives.

In addition, a K-12 or college teacher using Zoom may consider the following:

- To avoid Zoombombers: Ensure that you require a password to enter a Zoom meeting. Insist that students use their real names to enter, not a nickname, so you know who is in the room with you. Know what settings you have chosen when setting up a meeting.
- To avoid being the victim of a deepfake: Consider using a PowerPoint or screenshare instead of showing yourself.
- To minimize undue data sharing: Log in using your web browser, not the application on your desktop or on your phone. Read and understand the privacy policy.

Video is not the only way to teach online, but offers a personalization that is not felt from viewing a website, working from instructions provided in a PDF, or going to YouTube videos. Lederman (2020) points out that the teaching skills needed to teach online are different than in person; while the technology is important, it is the pedagogy designed for online learning that must be addressed as well as the cultural implications of change. This means that the tools are not the only component to consider – although surely the use of any tool must be careful and knowledgeable.

REFERENCES

Cole, S. (2020, April 16). This open-source program deepfakes you during Zoom meetings, in real time. *Vice.* https://www.vice.com/en_us/article/g5xagy/this-open-source-program-deepfakes-you-during-zoom-meetings-in-real-time

Considine, A. (2020, May/June). The Zoom where it happens: Academic theatre programs quickly adjust to remote learning in the age of COVID-19. *American Theatre, 37*(4), 20-23.

Freedman, M. (2020, June 17). How businesses are collecting data (and what they are doing with it). *Business News Daily.* https://www.businessnewsdaily.com/10625-businesses-collecting-data.html

Fudge, T. (2018, Fall). Online learning today: An extension of your grandmother's correspondence course. *Colleague 2 Colleague (C2C) Digital Magazine, 1*(10), 11. http://scalar.usc.edu/works/c2c-digital-magazine-fall-2018--winter-2019/online-learning-today-extension-grandmothers-correspondence-course

Gerstner, E. (2020, January). Face/off: "DeepFake" face swaps and privacy laws. *Defense Counsel Journal, 87*(1), 1-14.

Greengard, S. (2020, January 1). Will deepfakes do deep damage? *Communications of the ACM, 3*(1), 17-19. https://doi.org/10.1145/3371409

Hardawar, D. (2016, December 20). '*Rogue One' is a milestone (and warning sign) for CG resurrection*. Engadget. https://www.engadget.com/2016-12-20-star-wars-rogue-one-cgi-actor.html

Hodge, R. (2020, May 8). Zoom security issues: Zoom buys security company, aims for end-to-end encryption. *CNet.* https://www.cnet.com/news/zoom-security-issues-zoom-buys-security-company-aims-for-end-to-end-encryption

Koch, R. (2020, March 20). *Using Zoom? Here are the privacy issues you need to be aware of.* Security Boulevard. https://securityboulevard.com/2020/03/using-zoom-here-are-the-privacy-issues-you-need-to-be-aware-of/

Krebs, B. (2020, April 2) 'War Dialing' tool exposes Zoom's password problems. *Krebs on Security.* https://krebsonsecurity.com/2020/04/war-dialing-tool-exposes-zooms-password-problems

Krolik, A. & Singer, N. (2020, April 2). A feature on Zoom secretly displayed data from people's LinkedIn profiles. *New York Times.* https://www.nytimes.com/2020/04/02/technology/zoom-linkedin-data.html

Lang, J. M. (2020, May 18). On not drawing conclusion about online teaching now – or next fall. *The Chronicle of Higher Education.* https://www.chronicle.com/article/On-Not-Drawing-Conclusions/248797

Lederman, D. (2020, April 1). Preparing for a fall without in-person classes. *Inside Higher Ed.* https://www.insidehighered.com/digital-learning/article/2020/04/01/preparing-quietly-fall-semester-without-person-instruction

Lorenz, T. (2020, April 7). 'Zoombombing': When video conferences go wrong. New York Times. https://www.nytimes.com/2020/03/20/style/zoombombing-zoom-trolling.html

Luskin, B. J. (1976). *Coastline Community College: A dream with a reality*. Fountain Valley, CA: Coastline Community College.

Morrison, S. (2020 May 7). Zoom tries to buy its way out of its security problems. https://www.vox.com/recode/2020/5/7/21250560/zoom-keybase-facebook-google-encryption-video-chat

Paul, K. (2020, April 9). Worries about Zoom's privacy problems? A guide to your video conferencing options. https://www.theguardian.com/technology/2020/apr/08/zoom-privacy-video-chat-alternatives

Sleator, R. D. (2010, August 1). The evolution of eLearning background, blends and blackboard. *Science Progress, 93*(3), 319-334. https://doi.org/10.3184/003685010X12710124862922

Toews, R. (2020, May 25). *Deepfakes are going to wreak havoc on society. We are not prepared.* Forbes. https://www.forbes.com/sites/robtoews/2020/05/25/deepfakes-are-going-to-wreak-havoc-on-society-we-are-not-prepared

Wagenseil, P. (2020, July 11). Zoom security issues: Here's everything that's gone wrong (so far). *Tom's Guide.* https://www.tomsguide.com/news/zoom-security-privacy-woes

The Features of Online Transformative Negotiation —From the perspective of mediation—

Mayumi Kubota
mkubota@kansai-u.ac.jp
Professor
Kansai University
Osaka, Japan

Yuka Suzuki
ys110@obirin.ac.jp
Lecturer
J.F. Oberlin University
Tokyo, Japan

The propose of this study is elicit the features of online facilitative negotiation, especially by focusing on the nonverbal communication in relation to verbal communication. The concept of affordance was used to capture the mutual dependency between zoom and the users. To obtain the data, mediation role plays was conducted twice with two sent of three participants. After the role plays, the focus groups discussions and individual interviews were conducted. All of the mediation role plays and interviewed were recorded with zoom and used for analysis. The features of zoom afford the participants to listen to the others carefully. On the other hand, zoom afford the different kinds of self-image of the participants, and that is not favorable in case of conflict resolution. Recoding system of zoom will be useful feature for educational purpose since the participants can observe their own body and facial expressions.

Key words: Negotiation, mediation, online, role play, zoom

INTRODUCTION

The propose of this study is elicit the features of online facilitative negotiation, especially by focusing on the nonverbal communication in relation to verbal communication. There are several types of mediation such as transformative mediation and facilitative mediation and so on. For example, transformative mediation seeks to go beyond conflict resolution and transform the parties, especially the relation between the parties. The primary goal of the transformative approach to mediation is fostering "moral growth" of the parties, as well as the society. Facilitative mediation is intended to assist the problem solving between parties in the conflict by a mediator who do not have a specific authority of decision-making power. The goa of the facilitative mediation is to reach win-win solutions, and instead of focusing on difference of superficial opinions between parties, the focus is on what both parties really care about. Through the discussion, their relationship may transform from negative and destructive to positive and constructive. A mediator is responsible for managing the process of interaction, as well as responsible for being neutral, respecting each party's self-determination, providing a safe environment for negotiation, and ensuring confidentiality so that they can have the conversation they want. Therefore, in this study, we decided to conduct the role play of facilitative mediation in order to capture the features of online mediation as much as possible by focusing on the nonverbal communication.

So far, facilitative mediation is conducted mainly face-to-face situation and it is not common to hold it online. However, it will be more valuable and beneficial, if it could be conducted online under COVID 19. In order to conduct it online, it is necessary to capture the features of online mediation.

Mediation is used for teacher training for legal specialist (Mashiko, 2017) and educational setting (Burrell, Zirbel & Allen, 2003, Malizial, & Jameson, 2018). In Japan, mediation is attracted for eliminate bullying at schools (Takeda, 2020).

One of the characteristics of mediation is that two parties are in the situation of the conflict, thus

they become emotional depending on the flaw of the mediation. Thus, in this study, we decided to focus on the nonverbal communication in relation to the verbal communication to capture the features of online mediation. Generally nonverbal message are classified into eight categories, body movement (eye movement, facial expression etc.), para-language (tone of voice, speed, back-channel, etc.), time management, environment (layout of furniture, lighting etc.), proxemics (space and distance), artifact, physical characteristics, and touch. These categories can be used for analyzing virtual interaction (Yashima & Kubota, 2012).

The word affordance means "something that refers to both the environment and the animal… The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill" (Gibson, 1979: 127, cited from Harwood & Hafezieh, 2017, P.4), It can be both positive (e.g. beneficial) and negative (e.g. injurious). "Whereas the meaning of an object may change with the observer's changing needs, the affordances offered do not change, are invariant, being always present. However, an affordance is not a property or quality residing in either the object or subject, but relates to how objects are perceived with regard to their possibilities for use" (Harwood & Hafezieh, 2017, P.4). Sakai, Shigeji & Komatsu (2002) explain about this relation by drawing a diagram with the examples (Figure 1).

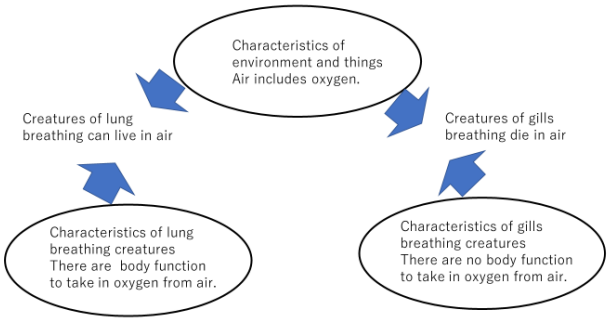


Figure 1 The meaning of environment for living body is determined with the relation between the characteristics of living body and the characteristics of environment
(Sakai, Shigeji & Komatsu, 2002, p.164)

In Figure 1, the example of characteristics of environment is "air involves oxygen." This characteristic is beneficial for creatures of lung breathing while disadvantage for creatures of gills breathing. Therefore, it is important to capture "mutual dependency between environment and living body" when the word. Affordance is used (Sakai, Shigeji & Komatsu, 2002, p.165).

Therefore, in this study, in order to elicit the features of online mediation by focusing on the nonverbal communication, the perspective of affordance will be used to capture the mutual dependency between zoom and the users.

RESEARCH METHODS

The mediation role play was conducted with two groups of three players by using zoom. In each group, one becomes mediator and the other two become the business persons in the same companies. Two sets of the mediation role play were recorded for analysis. Right after two role plays, two focus group interviews of three members were conducted. In addition, individual interview of six members was conducted by watching the recorded role play. Two focus group discussion and six individual interviews were conduced with zoom and recorded for analysis. Table 1 shows the descriptions of six members and table 2 show the schedule and the length of time of each interview.

Table 1 Description of Participants

Name	Gender	Role	Career
A	F	mediator	Consultant
B	M	Mr.A	Shio-Shoshi lowyer
C	F	Ms.B	Professor
D	M	mediator	Shio-Shoshi lowyer
E	M	Mr.A	Shio-Shoshi lowyer
F	F	Ms.B	Consultant

Table 2 Schedule of collecting data

Schedule	Data collection	Time (minutes)
May 26th	mediation role play	55
	focus group discussion	60
June 7th	mediation role play	57
	focus group discussion	100
June 11th	individual interview C	120
June 15th	individual interview B	115
June 20th	individual interview F	125
June 22th	individual interview E	130
June 23rd	individual interview D	140
June 25th	individual interview A	140

Two transcriptions were made from the recorded role plays and were used by two authors when individual interview was conducted in order to keep a record whatever the members mentioned. After the individual interviews, the authors asked each member to add whatever she/he thinks important in the transcription within a week. After the member added their comments, the transcription was sent back to the authors with e-mail.

The data of two focus group interviews and six individual interviews as well as two transcriptions with members' comments were analyzed in terms of verbal and nonverbal communication.

The scenario of the role play was written by the second author, Suzuki, who is a professional of teaching collaborative mediation.

In the scenario, one becomes mediator and the other two become the business persons (Mr. A and Ms. B) in the same company, but they are in the different department, one is in the head office while the other is in the human resource department. Because of recent increased number of foreign workers such as technical interns, the director of the company created diversity promotion committee and asked to create concrete measures as soon as possible. In order to pursue this project, committee members were collected from each department. However, the conflict between Mr. A and Ms. B becomes fierce. Mr. A emphasized the face-to-face meeting in order to create an idea while Ms. B preferred to use dropbox as much as possible without meeting frequently. Thus, Mr. A decided to ask a mediator who belongs to a mediation group. The detail of the scenario was given to three role players one day before the role plays.

Data was analyzed mainly from the perspective of attendance by focusing on nonverbal communication.

RESULTS

Zoom is one of the cloud-based video conferencing service which anyone can use once the application was download. In this study, zoom education was used to conduct the role plays and interviews. The features of zoom are summarized as follows.

The features of zoom

- More than two participants can meet virtually thorough Internet. Thus, the participants can access to a meeting from their own rooms (places).
- The participants can use virtual background if they don't want show their background.
- The participants can select either "gallery view" which shows all the participants evenly or "speaker view" which shows the speaker in the center and other participants are shown smaller size on the top of the speaker.
- Not only the faces of the participants but also their own face is simultaneously shown on the screen.
- The yellow rectangle frame shows the speaker or the participants who made some sounds.
- The process of meeting can be recorded either by video or audio-only or both.
- The participants can shut down the connection by themselves easily.
- The participants have to use a mic and a speaker to talk and listen to the others.

Two factors that varies

- Depending on the devices such as a personal computer or tablet, the size of the screen, the position of a mic and camera differs.
- The skills of using zoom might differ among the participants. These two factors will affect their communication styles.

The premises of online mediation

To conduct the online negotiation means two parties agreed at least to sit in front of the personal computer to talk each other without escaping or refusing any communication. That will be one of the premises of online mediation.

Several confirmation conditions

There are several confirmation conditions in regards to online mediation given by a mediator before starting a mediation. First, a mediator needs to check whether there is anyone around the participant or in the same room. It will be a good idea to ask a participant to move a camera around the place to make sure anyone is not around. In addition, the mediator asks the participants not to record the process. Confirmation conditions were given by a mediator besides the usual statement of confidentiality and turning off the switch of a mobile phone.

The techniques the mediator used

The role of the mediator is to elicit valuable information from two participants and let them find the common goal by themselves. To do that, the mediator care for equality and equity of two participants. The followings are the technique the mediator used in our data.

Environment

- The mediator cared for their background. They tried to make it simple such as sitting in front of the white wall or using simple virtual background in order to avoid any destructions.

Para language

- The mediator nodded moderately while listening. The mediators avoided nodding intensely or saying "I see" since these behaviors might show their agreement with the opinions raised by one of the participants.
- On the other hand, nodding was the only way to present their supportive attitude, they regulated their use of nodding intentionally. They knew that they could not use eye contact and back channels for online meeting as much as for face to face meeting. One of the mediator described that he was like jizo (stone statute) since he did not turn his body sideways to see the participants.

- The mediator avoided any overlapping conversation since it was hard to listen.
- Breathing, the change of emotion, atmosphere created by the whole body of the participants were difficult to observe with zoom. On the other hand, the mediator could concentrate to the content of the meeting.

Body movement
- Only upper part of the body was shown in the screen, so the mediator could not see the whole body to check their reaction or so. In addition, the moderator could not show their posture of listening to the participants by taking notes and so on.
- The moderator moved back ward to let the participants talk freely.
- Any body movement was noticeable since everybody faced to the front.

Eye movement
- When the meeting was not so exiting, then, the mediator could close his eyes.

Facial expression
- It was easy to check the facial expression of both participants simultaneously

Time management
- One of the mediators noticed time lag so he decided to adjust time lag by saying a word a bit earlier than usual.
- The moderator cared how to balance time between two participants.

To keep the equality and equity
- The moderator tried to provide the same amount of time to talk
- The moderator tried to give the same opportunities to talk
- If one of the participants was a first time to meet for the moderator, then, he tried to show neutrality more than usual in order to avoid any prejudice or stereotypic views to him. To show the neutrality, he nodded with light voice.

Two participants paid attention to the following nonverbal codes.
Environment
- The layout of each participant on the screen was important. When one of the participants was allocated to the moderator closely, another participant felt uneasy.

Para language
- The loudness or tone of the voice.
- Speed and tempo

Body movement
- Hand gestures were not be able to be seen.
- Since every participant sat firmly in front of the camera generally, any body movement was noticeable.
- It was difficult to turn the body sideways, since the participants watched the camera.

Facial expression,
- It was difficult to find what the participants were actually seeing. However, the facial expression and the eye movement were easy to notice.
- While talking, the participants could check their own facial expression.

Turn taking
The participants took the turn by raising a hand or saying “excuse me.” However, compared to face to face conversation, the frequency of taking a turn was not many. The participants avoided interruption even though he became upset and moved his feeling while listening to other participant.

Affect to the verbal communication

- Since it was difficult to affirm that the participants really understood what the other participant said with nonverbal cues, the mediator intentionally summarized more frequently and more precisely than usual face to face conversation. That helped the participant to make a smooth communication.
- Since it was a role play mediation, it was Singapore where Ms. B was in the scenario, but in the mediation, Ms. B mentioned New Zealand instead of Singapore, because she had a conversation about New Zealand with her husband just before starting the mediation role play with zoom at her home. Thus, physical environment affected her selection of a word in the conversation.

Choices: look or not, listen or not,

The participants can choose whether they look at the party or not, whether they listen to them carefully or not depending on the conflict.

DISCUSSION

Zoom meeting creates a behavior to listen to the others until the last moment, since it is not easy to take a turn as frequently as face to face meeting. Yellow frame forces the parties not to talk simultaneously, since it looks like an alert for overlapping the voices. In addition, all of the participants sit in front of the camera and the upper body faces to the front. Thus, any small body movements and facial expressions appear outstanding and easy to be observed. Thus, for the moderator, it might be easy to watch two participants simultaneously with zoom.

For the participants, presenting self-image is affected by the features of zoom. If the participant is accustomed to use zoom, then he can relax to talk. However, if he does not accustom to use it, he might move around his eye to see the camera or a screen etc. and that does not make a good impression to the other participants. In addition, if the position of the camera and the mic is not placed appropriately, then the voice does not sound clearly, and that also makes the impression of low self-image.

In case of virtual mediation, the participants talk in their own rooms, then, they can relax and feel safe. These are summarized in the figure 2 as the results of affordance of zoom.

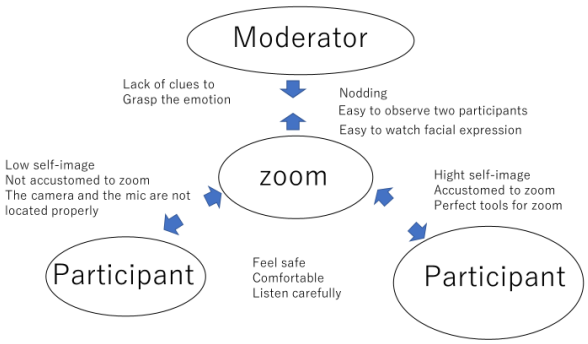


Figure 2 Affordance of zoom

The purpose of the mediation is to solve the conflict between two parties. To do that, the mediator have to pay attention to keep the power balance equal and control their emotion. Therefore, first of all, the gallery view should be used, and need to check the lay out of the participants. If there are three persons, then two persons should be shown upper row, and the mediator is under row and the center. Even the distance between the moderator and the participants should be equal in the screen.

The most unique feature of zoom is that the face of all of the participants are shown on the screen. Thus, if the participants feel anger, he can also see his own facial expression, and that makes him calm down. Or he can make the fake posture to show off to the others. It works as a mirror.

The function of recording can be used for educational purpose. Recording should be prohibited for mediation, however, id it is a educational purpose, it is very useful. The students can record any

mediation or mediation role plays and they can watch it and check their own behaviors and facial expression. It will be a good training to understand the process of mediation as well as body and facial expressions. That will be the future study.

Acknowledgement

This work was supported by JSPS Grant-in-Aid for Scientific Research (KAKENHI) Grant Number 2 0 K 0 3 1 9 1.

REFERENCES

Ando, N. & Tanaka, K. (2015). *Choutei ni kakawaru hito nimo yakudatu Mediation Nyumon (An introduction to mediation that is useful for those involved in mediation).* Tokyo, Japan: Koubundo

Burrell, N. A., Zirbel, C. S. & Allen, M. (2003). Evaluating Peer Mediation Outcomes in Educational Settings: A Meta-Analytic Review, *Conflict Resolution Quarterly*, 21 (1), 7-26.

Coleman, P.C. & Lim, Y. Y. J. (2001). "A systemic approach to evaluate the effects of collaborative negotiation training on individuals and groups." *Negotiation Journal* October. (pp.363-391)

Harwood, S.A. & Hafezieh, N. (2017). 'Affordance' ---What does this mean? Conference paper, Conference: 22nd UKAIS Annual Conference, St Catherine's College Oxford, UK

Keethaponcalan, S. I. (2017). *Conflict resolution: An introduction to third party intervention.* New York: NY. Lexington Books

Malizial, D. A. & Jameson, J. K. (2018). Hidden in plain view: The impact of mediation on the mediator and implications for conflict resolution education, *Conflict Resolution Quarterly*, 35 (1), 301-318. DOI: 10.1002/crq.21212

Mashiko, H. (2017). Gyoseishoshi ni Taisuru mediator yosei purogram no gakushu kouka. The learning Effects of the Mediator Training Program for Certified Administrative Procedures Legal Specialists, *Japanese Journal of Counseling Science*, 50, 1-12.

Sakai, Shigeji & Komatsu (2002). Gibson shinrigaku no Kaukshin, The Core of Gibson Psychology. Tokyo: Keido Shobo. P.164

Takeda, T. (2020). Ijime wo nakusutameni ha dosureba yoika. Bokansha wo Chusaisha ni kaeru. How do we Eliminate Bullying? To Change into a Mediator from a Bystander, Journal of Yasuda Women's University, 48, 147-158.

Yashima & Kubota, (2012). Intercultural communication- Global mind and local affect. Tokyo: Shohakusha.

Two by Two on One

Katherine Watson
bizarrissime@gmail.com
Professor
Orange Coast College
Costa Mesa, California, USA

Diversity in education is an increasingly discomfiting subject, fraught with talk of human values, the significance and impact of technology, and of how to meet diverse populations in diverse ways, especially as new-style classrooms face the world through the Internet at a distance, with learners linking virtually to others across the globe, across ethno-cultural, economic, and other divides, dependent almost exclusively upon Information and Communication Technologies (ICT) that are themselves in continuous flux. The present paper proposes elaboration and exploitation of a "two-by-two-on-one" system to promote and facilitate human-machine-subject matter interaction in an age of dizzying diversity: Teaching and learning comprise the first "two"; teachers and learners make up the second "two"; subject matter defines the last, nexus-like "one". It will be made evident that the most effective means of realizing effective two-by-two-by-onery is through exploitation of diverse transdisciplinarity.

Key words: Education online, technology, ICT, diversity, distance learning, transdisciplinarity

INTRODUCTION

Discussions and debates over the subject of *diversity* in education have become increasingly tense, fraught with talk of human values and the significance and impact of technology, of talk about what it means to meet diverse populations in diverse ways. The topic has become even more vital as new-style classrooms face the world through the Internet and at a distance, with learners linking virtually to others across the globe and across ethno-cultural, economic, and other divides.

Information and Communication Technologies (ICT) are in continuous flux, however, as are the activities of their diverse users and developers. And like the people who work with ICT, the technologies themselves have become overwhelmingly complicated, multifaceted, with each facet demanding interest, expressivity, voice. This is indeed transdisciplinary, boundaryless, *diversity*.

The present paper proposes the elaboration and exploitation of a "two-by-two-on-one" system to promote and facilitate human-machine-subject matter interaction in an age of dizzying diversity: Teaching and learning comprise the first "two"; teachers and learners make up the second "two"; subject matter defines the last, nexus-like "one".

RESEARCH DESIGN & METHODS

Research for this paper has included a review of the literature into the two pairs of educational notions that it proposes for joint study, as well as a further review of literature demonstrating the reasonableness of placing subject matter alone as a theoretical nexus that would and will unite diverse people and the things they think and do. And at last, it will be seen that the integrative notion of transdisciplinarity unites all in a non-hierarchical truly diverse way. Transdisciplinarity encompasses a call upon diverse stakeholders and

thinkers, developers, users, teachers, learners, and even those who would observe or undergo the global mind-broadening consequences of innovative ICT input, to move forward best, two by two on one.

First, the paired concepts of "teaching and learning", it should be noted, are really not much more than similar "practices at the two ends of the knowledge acquisition process," with the former involving "imparting knowledge" and the latter incorporating "acquiring knowledge" (Hasa, 2017). As Hasa (2017) points out, while "teaching is always linked to learning and learners," learning can occur independently; that is, it can happen without a teacher present. Moreover, and for its part, teaching may be structured and formal, executed within a building or at least with a literal, physical frame around it, or it may be informal, transmitting intellectual, moral, or social instruction inside an abstract instructional frame that may lie only in the mind of the teacher. For its part, learning may be conscious or unconscious and is always a lifelong process; it occurs any- and everywhere. Abstract notions of teaching and learning comprise the syllabi of many of the world's schools of education, from Ohio and New York, in the United States, to Australia; teachers of teachers want to ensure that philosophical underpinnings are fixed in educationalists' minds before lesson learning takes place. In Australia, for example, a "teaching and learning cycle" offers "social support through interactional routines" of individual, small- and large-group communication (Gniel, 2019). In the 21st century, Gniel has added, the teaching-learning cycle in question has benefitted greatly from interactional routines facilitated by ICT in the form of e-learning, smart classrooms, ICT-enhanced didactic equipment, and the like, as Oden (2020) has added.

Teaching and learning become more concrete as reality leads to the implementation of theory. And that implementation of theory can lead effectively to a better facilitated, cross-disciplinary development of teaching staff. This sort of development is evident in such American institutions as the private four-year Concordia University and at Virginia Tech (VT), as well as in the vast network of two- and four-year public schools that dot the state of Texas. For example, "Centers for Excellence in Teaching and Learning" in all these schools offer such programs as VT's "course design clinics" (Filer, at al., 2020) uniting educational theoreticians, technical experts, designers, and diverse subject matter experts to create "learner-centered" instruction. In Texas, a private school for youngsters called Center for Teaching and Learning has taken the state's university mandate writ small: Differentiated instruction and project-based learning are among the popular processes deployed in this "inquiry-based, parent-and-community involved" Pre-K through 12 establishment (Ellis, 2020), whose graduates are encouraged to pursue university degrees at one of the aforementioned Centers for Excellence-enhanced institutions. Notably, as differentiation and integration proceed, so does the diversity-based notion of transdisciplinarity: This is a concept that "transcends disciplinary boundaries," as Savage and Drake (2016) have written, to facilitate "whole, integrated teaching" and to lead to "whole learning" that is inclusive, relational, harboring broad-based broad-seeing diverse views of the world and its educational subject matters (Savage and Drake, 2016).

Teaching and learning have become, almost by necessity, loci of discipline-unbounded ICT. As Sakhamuri (2016) has written, "ICT is a term for Information technology, which is a technological source

to make information available at the right time, right place in the right form to the right user." Furthermore, as Sakhamuri continues, ICT can render the learning process more satisfactorily "experiential" and "experimental", the latter in the literal sense, taking advantage of the latest news in an environment that encourages interaction and communication, not just within a single academic domain but transdisciplinarily, across subject-matter boundaries.

Thus, the second pair of educational elements is necessarily called into play to profit from and then execute the first: Teachers and learners make up the second duo of educational discovery and delivery.

Teachers and learners clearly comprise the genuine, authentic personal touch, the very human part of that part of the human sciences that is education. Teachers and learners make real what teaching and learning encompass as theoretical.

In education, as Oden (2020) has noted, "it is generally believed that ICT can empower both teachers and learners." As a dynamic, ever-changing set of diverse tools and meta-tools—tools with which to use tools—ICT is a change agent: "It promotes change to education in the 21st century. It transforms not only teaching but also the learning processes…provid(ing) learners an opportunity to develop creativity, communication skills, and other thinking skills" (Oden, 2020).

Necessarily, subject matter is the nexus where the teaching-learning and teacher-learner pairs interconnect. In the twenty-first century, when Information and Communication Technologies (ICT) are serving as delivery systems for diverse course content in schools, acting as information conduits to research resources of all kinds from around the world, and performing as office managers for teachers who would connect more easily with students, the aforementioned notion of transdisciplinarity is becoming ever more timely. That is, the idea that the study of many—if not most—subjects can benefit from integrated analysis, the essence of transdisciplinarity, is becoming ever better accepted. As Savage and Drake (2016) have noted, a diverse curriculum based on transdisciplinarity "is an iteration of an integrated curriculum…a comprehensive framework that tries to go beyond combining existing disciplinary approaches …to create new frameworks, new overarching syntheses." Given that teaching and learning are undergoing a shift toward "involvement of the entire person," as Savage and Drake (2016) have put it, and given that teachers and learners are ever more frequently and successfully tackling tasks that comprise "not just intellectual activity but rather the entire person: mind, body, and emotions," ICT can offer the best path toward what Savage and Drake call "the far end of a continuum with increasing degrees of integration" of the kind that will address the "complex problems that exist in the 21st century". Considering small problems and large ones, questions deep or ethical or even ludic, by including experts and stakeholders in varied, diverse aspects of those problems will pique interest in them and will render their solutions more workable, better accepted. As an overarching communication and information bridge, ICT can be used to fashion new frameworks for critical thinking and mental syntheses, inviting innovative teaching and creative teachers to transmit learning to students who are already lapping up knowledge in ways unimagined less than a generation ago.

RESULTS

Results of the study reveal that diverse national and local governmental bodies, as well as academic and social institutions, private enterprises, economic organizations and individual activists worldwide, have analyzed and reported upon the phenomena surrounding the world's use and exploitation of ICT.

For their part, student learners have found that ICT has become "a must for daily life," as Oden (2020) has written, empowering and transforming the quotidian in multiply diverse ways. A United Nations "Learning Portal" white paper reports that "ICT has become integral to the teaching-learning interaction, through such approaches as replacing chalkboards with interactive digital whiteboards, using students' own smartphones or other devices for learning during class time, and the 'flipped classroom' model where students watch lectures at home on a computer and use classroom time for more interactive exercises" (UNESCO, 2019).

Notably, as the UNESCO report warns, teachers and learners have to be digitally literate and trained, as well as security-aware, and they must have access to ICT if these approaches are to lead successfully to the diverse "higher order thinking skills," creative and individualized options, and stimulation of transdisciplinary thought that "the ongoing technological change in society and the workplace" is generating anew each day.

As UNESCO (2019) reports, "the total cost of ICT ownership is considerable, (with) ongoing technical, human, and organizational support needed in order to ensure access and effective use of ICT." In countries such as France and India, government-sponsored and -provided tools are available in public places, libraries, schools, and community centers, usually free of cost. Cybercafés facilitate online access in the Philippines and in some African countries where stable, affordable Internet connectivity is rare and where security measures are spotty. As UNESCO reports, some institutions in places as diverse as Canada and Australia are participating in a "BYOD" system, in which learners "Bring Your Own Device" to class, sometimes for individual use and sometimes to share. Educators must remember that not all families can afford devices or service plans, of course. If schools are to depend upon ICT, they must ensure ICT access; as Stavert (2013) has reported to have been the case in Australia, although "the devices are a significant part of students' lives", that does not mean that they can or should be "appropriated for school," particularly in cases or places where diversity signifies inequities. Teaching and learning may be thought to be facilitated through such practices as BYOD, but the teacher and the learner may not always profit equitably.

UNESCO's international survey reveals that teacher professional development must be easily available, helpful, and ongoing, as well as free, at any time in any place. In addition, such professional development must include not just the "hard skills" of learning ICT and a particular school's use of it but also the "soft skills" of understanding diverse learners' connectivity problems, accessibility irregularities, and simple frustrations at using as a school tool something that was once joyfully ludic. "Accessing online resources, fostering student interaction and collaboration…(and) broadening students' academic thinking"

can result from effective use of ICT, while ineffective use can lead to simplistic single-discipline-based, skills-based applications of ICT, as if ICT were simply a set of fancy tools.

As Stavert (2013) points out, “Our students have only ever known a world with Google, Wikipedia, MySpace/Facebook/Twitter/Instagram, and mobile phones with high-speed Internet.” Transdisciplinary access is now available, Stavert continues, to diverse ideas, resources, people, and communities in more than 90% of the world. “The cell phone is the primary point of access” to friends and phenomena, Stavert has noted, for populations rich and poor, rural and urban.

And so it behooves educators and others who would interact with ICT to consider in new, transdisciplinary ways the question of how technology, diversity, and people interact. Exploitation of a two-by-two-by-one system will facilitate such interaction.

The notion that various subject matters and the ideational structures that surround them comprise a nexus that connects the paired notions of teaching and learning to the coupling that marries teachers to learners can and should help to stimulate effective, transdisciplinary education. It can at once break up barriers between the professoriate and the student body and also promote interaction and interchange of diverse ideas, particularly in a world where age, sex, and socioeconomic boundaries are being better addressed; as it becomes more evident that teaching and learning are indeed aspects of the same human awareness continuum, it is also becoming clearer that hierarchies of awareness do not really amount to much. Diverse transdisciplinarity serves as a subject matter inclusive nexus in which each of us can teach and learn from each other.

REFERENCES

Axford, B., Harders, P. & Wise, F. (2009). Scaffolding literacy: an integrated and sequential approach to teaching reading, spelling and writing. Camberwell, Victoria: ACER Press.

Cowen, R. (2017). The Teaching and learning cycle. New York: The Learning Network.

Ellis, L. (2020). Why CTL? The Woodlands, Texas: Center for Teaching and Learning.

Gniel, S. (2019). Teaching-learning cycle: Reading-writing connections. Literacy Teaching Toolkit. Victoria State Government: Education and Training.

Filer, K. et al. (2020). Workshops: Course design clinics. Virginia Tech: Center for Excellence in Teaching and Learning, Blacksburg, Virginia.

Hasa, O. (2017). Difference between teaching and learning. *PEDIAA*. 7 January.

Oden, C. (2020). Impact of ICT on teaching and learning process in the 21st century. *Project Topics*. Summer.

Ohio Department of Education. (2020). Teaching and learning cycle. Principal Orientation PowerPoint Presentation.

Sakhamuri, A. and Adusumilli, R. (2016). Need and importance of ICT in education. MyClassboard. Hyderabad, India.

Savage, M. and Drake, S. (2016). Living transdisciplinary curriculum. International Electronic Journal of Elementary Education, September.

Stavert, B. (2013). BYOD Literature Review. State of NSW Department of Education and Communities: NSW Policies in Education

UNESCO (2019). Brief 4: Information and communication technology in education. UNESCO: Learning Portal.

Asian International Projects focusing on SDGs4

Hsieh Chia Ling
ling4028@gmail.com
Master's Course
Nihon Fukushi University
Nagoya, Japan

Makoto Kageto
makoto@kageto.jp
Affiliated Professor Nihon Fukushi University
Nagoya, Japan

Shinichi Sato
Satoshin@n-fukushi.ac.jp
Professor
Nihon Fukushi University
Nagoya, Japan

We have participated in the Asian Students Exchange Program (ASEP) more than 20 times. Japanese scholars and Taiwanese scholars discussed to design the Asian Students Exchange Program (ASEP) In 1997, aiming to enhance ICT utilization and English education in the Asian region. We have been referring to Instructional Design theory such as "Task-Based Instruction"(Reigeluth,2016) to narrow down digital divides. Last year, in 2019, we welcomed the 20th anniversary of the Asian Student Exchange project with the warm-heated support of the Board Chair of Kaohsiung Bureau of Education.
Relying in Instructional Design such as "Learner-Centered Instruction"(Reigeluth,2016), we have been clarifying the effective paradigm based on authentic settings.
Instructional design (ID) research in international collaborative activities must account for Asian English that young generations are tackling as E.F.L, not second language.
in case of Japan and Taiwan, 97% of people speak mother languages in their daily lives so that they have to find out something sufficient occasion as a new learning environment. they also devote themselves to overcoming classroom English learning with very little time devoted to actual conversational practice. In ASEP learning environment, breaking through insularism, an implementation of " Task-based Instruction" inspires the young generations' to pave the way to internationally minded person.

Key words: EFL, English Presentation, Collaboration, Task-Instructed Learning.

INTRODUCTION

Recent Trend in Japan

The Ministry of Education, Culture, Sports, Science and Technology has lunched Giga school Project in 2019.(GIGA = Global and Innovation Gateway for All, Two billion USDs.) The government will distribute one computer to each elementary and junior high school student by 2023. They also build high-speed networks to improve the quality of education. Realization of individually optimized learning without leaving anybody behind.

The following are shown as concrete measures.

・Development of digital texts and digital teaching materials.

・Sharing examples of effective use of ICT in each subject across the country.

・development drill teaching materials using AI. This is a system in which AI analyzes what a student is doing wrong and leads them to related sub-learning items that they need understand. This GIGA School concept is intended to foster children who can survive the society of 5.0 which is conscious of the 4th Industrial Revolution.

In Taiwan

According to National Development Council (NDC) (2018), NDC announced "the Blueprint for Developing Taiwan into a Bilingual Nation by 2030 to serve as guidelines, aimed toward 2030 as the target year for developing Taiwan into a bilingual nation, raising the people's English proficiency and enhancing Taiwan's international competitiveness" (pp.3). From this passage, it is obvious that English learning is considered as emergent theme in Taiwan. As emerging the importance of English learning, it is, in fact, closely related to the development of ICT implemented in English education. NDC also states that "Using emerging technologies such as AR and AI, distance digital learning, digital learning partnership, online learning platforms, English cloud platforms, and other technology tools, to close the gap between schools and create learning opportunities" (pp. 14). Therefore, accelerating both English education and ICT education at the same time is believed immensely important in Taiwan.

According to "The Master Framework for the 12-year Basic Education Curriculum Guidelines" (Ministry of Education, 2014), English education starts from 3rd grade and ICT education starts from 7th grade (pp. 9). However, there is also the movement that trying to develop English education from kindergarten (Ministry of Education, 2019, pp.1). In addition, AR or AI technology into English education to organize learning environment is also targeted (Ministry of Education, 2019, pp.6-7). As a case of combining ICT with English language education, some examples can be found such as applying and study APPs into English class in junior high school (Chen, 2016). In this case, teachers and students utlize mobile tablets. At first, teachers ask students to download the English learning APPs, such as "Let's Talk in English" to let students learn autonomously. In addition, by using "Ping Pong" which gives the practice to the students, teachers also can monitor how much students understand the contents.

We focus on the English varieties in the Asian region. In most of Asia, the status of English is not as a second language but a foreign Language. ICT education is advanced year by year, Not only learning that, more authentic setting should be designed for students to experience real-World communication with ICT and English.

Experiential Learning

experiential Learning explicitly differs from learning in School.
learner in experiential learning such as authentic setting learning have to response quickly in the process of collaborative work. they have to decide what they stand for, what they think what they face next issue. this ability is named "active knowledge", that differs from "school knowledge" such as just storing the infromation without applying to authentic occasions.

SDGs4 and ASEP

United Nations advocated Sustainable Development Goals. One of Goals is SDGs4, "quality of Education". we are required to achieve by 2030, We would not leave no one behind.
After Covid-19, developing countries are trying so hard to install ICT education. They found digital divide caused tremendous inferior to the country where use home-Learning.
At the same time, Leaner-centered Education or Learning Pyramid become to know for these developing country to enhance quality education.

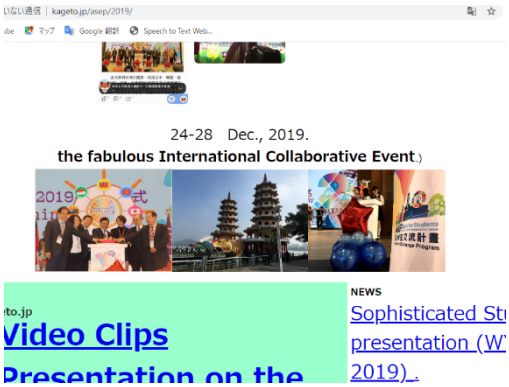


Figure 1 ASEP Site

ASEP is the efficient educational model for such a country which need to drastically change education. Being learner is crucial attitude for them to renew the education system in their country. ASEP suggest them how to design "learner centered instruction" or how to adapt "Learning Pyramid theory" into Classroom activities.

RESEARCH DESIGN & METHODS

Theoretical Background

ASEP is built on a foundation of experiential learning, as advocated by Kolb, which follows the learning cycle of "planning, concrete example, reflective observation, and abstract hypothesis." Not only students but teachers as well have learned how to enhance the project, reflecting this model.

Recent Hypotheses (new solution) involve how to act interaction with audience. ASEP 2019 has addressed this issue.

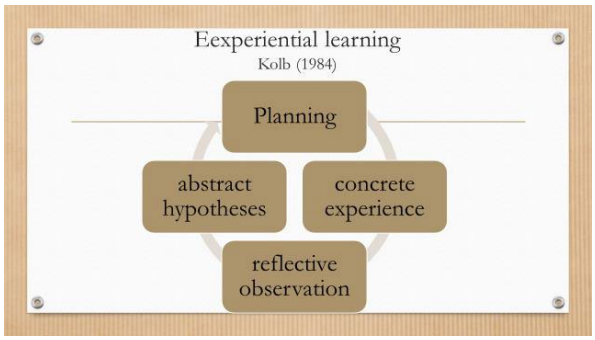


Figure 2 Kolb Experiential Learning

Methodology and Results

Two organizations

ASEP have been carrying out under the strong collaboration between Japan World Youth Meeting Steering Committee and Kaohsiung Education Bureau. they set two events for ICT and Global Education. one is ASEP in December, another WYM in Aug.
these cycle events already become the part of syllabus in schools. WYM will its 22nd anniversary this year. the more they continue , the easier for schools to participate in while understanding " Task-instructed Learning" referring the former data , such as video clips or PPT files.

every year both events gather more than 1,000 participant to deepen how Asian English works for communication.

Task-Instructed Learning

After visiting Taiwan Kaohsiung, Students are assigned to partner schools and aim to complete the collaborative presentation by the designated day, Dec. 28,29, ASEP2019.

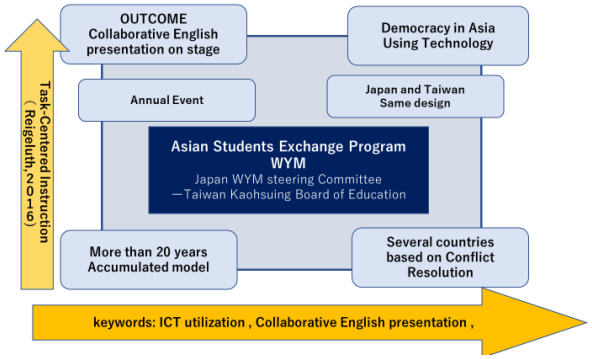


Figure 3 Two Organizations

Pre-Task

before going to Taiwan , Japanese students gather information regarding the them " SDGs and Students". of course, they can enjoy the ZOOM session where they discuss the Presentation structures. Sometimes they compose a comparative questionnaire between Taiwan and Japan. Some focus on democratic issues in South East Asia. Getting other' opining, they can get new viewpoint of democracy to draw the blue print for both countries. In that sense, real-time settings encourages them to discuss temporary Asian issues.

Task

There are more than 30 international teams in ASEP, that challenge the collaborative presentation. while enjoying and understanding another culture and communication way, home-stay program , they have to completed the presentation until the designated day, ASEP presentation day.

Basic procedure is the following suggested by forerunner students,

・To decide the core-message
they have to leave audience this message so that audience can remember leaving conference room.
・Find 3Topics , that will be pillars of the core-message.

・allots the topic according to the direction (Core-message)

English Utilization

During discussion to brush up their presentation, they use English freely to share Ideas. the students are free of language control. In all three stages they use all their language resources rather than just practicing several sentences in classroom lessons. Students involved in ASEP are developed from their experiences with the language that is personalized and relevant to their collaborative activity. The language explored arises from the students' needs. This need dictates what will be covered in the lesson,

Students' English ability involved in ASEP are developed from their experiences with the language that is personalized and relevant to their collaborative activity. The language explored arises from the students' needs. This need dictates what will be covered in the authentic settings. ASEP is a strong communicative approach where students spend a lot of time communicating.

you can see much time the students spend communicating during a task-instructed Learning without Teachers' suggestions.

Time to complete the presentation is quite limited so students are enforced to decide what to say , what they stand for, what should be done next, how to make response to keep the mainstream of their presentation. Most of Students are already more than 18years old.

Both Japan and Taiwan they are already voters of elections (JP 2016 ,Tw2018) . Autonomous decision and response should be cultivated. In real time communication, quick, enough responsible conversation without teachers are required.

Result

92 high school learners in Japan who participated in ASEP were the target of this questionnaire. This questionnaire was composed of three sections. The first one is focusing on the image of Taiwan, and the second one is about English skills when learners giving the presentation. The last one is referred how learners prepared the presentation with teachers' scaffolding, coaching, and instruction.

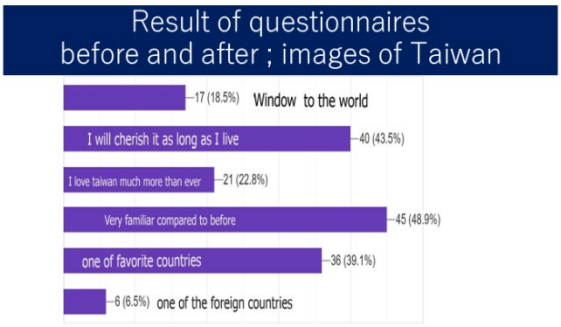


Figure 4 Images of Taiwan

According to the result of the questionnaires as for the first part, you can see that 17% learners think they got the opportunity to "see the world" via ASEP. This "seeing the world" means that Japanese learners who communicated with the Taiwanese participants were able to think with reflecting the viewpoint of Taiwan side. Next, 40% Japanese learners thought they had a great memory with Taiwanese participants and 21% Japanese learners stated they will cherish this experience as long as they live, in addition, love Taiwan much more than ever. Here, this demonstrates that learners started to feel and show their love to Taiwan through ASEP and this also may mean increasing the "fans" of Taiwan who may become the "bridge" between Japan and Taiwan in the future. Moreover, 36% Japanese learners think Taiwan has become one of their favorite countries. In addition, most learners think their image of Taiwan has changed compared to before.

This seems Japanese learners were able to learn the things which the subject of social study in the education in Japan does not cover. According to The House of Representatives (2005) in Japan, less information of Taiwan is referred in the textbook of junior high school. It is stated that Taiwan is in the column of "Countries with relations of territory or protection", but only one sentence of the Japan-China joint statement can be found, and it does not state that the People's Republic of China "owns" or "protects" Taiwan. (The House of Representatives in Japan,2005). Therefore, participating in ASEP makes Japanese

learners know more about Taiwan beyond the information provided on textbook through the experience of communicating face-to-face with Taiwanese learners. On the other hand, 6% learners did not change their image of Taiwan just like before. From these data, ASEP is not merely an international exchange event to make international "friends" and practice English but an opportunity to widen learners' global vision and may make a deep connection between Japanese and Taiwanese learners.

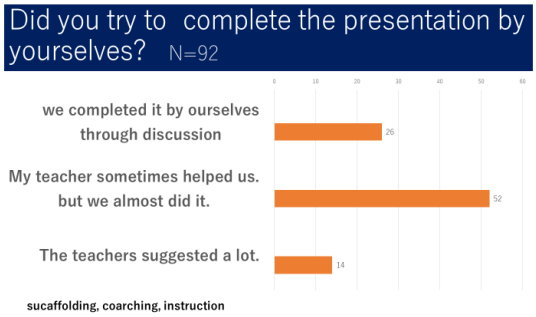


Figure 5 Presentations

Learners with having global vision after participating in ASEP, they got to know not only the things from other countries but also obtaining the skill to observe their own country objectively. This would help them to ponder the things of their own country critically, such as politics, and take an action to express their own viewpoints to achieve to build their "ideal country". This means, therefore, attending ASEP might be able to cultivate the character of a "good citizen" for democracy.

Next, in the second part, it focuses on presentation skills in English when learners giving the presentation. It shows that 70% learners cared about the prosody, 41% learners thought stressing the keywords is important, 57% learners thought their gestures and standing position are important, and 52% learners were trying to be an active listener. However, over all, Taiwanese and Japanese learners were caring about most presentation skills in English.

Lastly, in the third part, it focuses on how learners prepared the presentation with/without teachers' scaffolding, coaching, and instruction. As a result, 26% learners completed the presentation by themselves through discussion, 52% learners thought "their teachers sometimes helped them but almost did the presentation", but 14% learners "got the instruction a lot from their teachers". Those learners who did not need teachers' assistance or needed only a little assistance seems to meet the goal of "Task-Centered Instruction" (Reigeluth, 2016). However, those learners who needed a lot of assistance from teachers did not meet the goal so there must have needed extra support or change of the difficulty of the tasks for those learners. Especially, whether the learners were able to complete the presentation by themselves is very crucial because the goal of ASEP is for learners to learn how to solve the problems and collaborate with other participants autonomously. In addition, ultimately, it means they cannot be a "good citizen" to be able to express their own idea for democracy as it was stated in the observation of the first part of questionnaire.

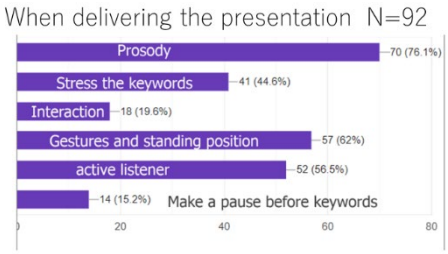


Figure 6 Presentation Tips

Students' English ability involved in ASEP are developed from their experiences with the language that is personalized and relevant to their collaborative activity. The language explored arises from the students' needs. This need dictates what will be covered in the authentic settings. ASEP is a strong communicative approach where students spend a lot of time communicating.

you can see much time the students spend communicating during a task-instructed Learning without Teachers' suggestions.

Time to complete the presentation i is quite limited so students are enforced to decide what to say , what they stand for, what should be done next, how to make response to keep the mainstream of their presentation. Most of Students are already more than 18years old.

Both Japan and Taiwan they are already voters of elections.(JP 2016,Tw2018) Autonomous decision and response should be cultivated.

In real time communication, quick , enough responsible conversation without teachers are required.

Conclusion

Due to the effective educational design, we could best find the suitable project to improve both English competency and global minded study supported by ICT and concept of Instructional Design.

In Japan, new courses of study start from 2020 that advocate 3 pillars comprised of Self-Directed learning, Interactive Learning and Deep Learning.

We would like to follow these revisions, and at the same time, we also strive to strengthen global authenticity, as suggested by the BOE in Kaohsiung and the teachers steering Committee.

Students had led an international team in making a joint presentation and overcoming langu age barriers. They had to mentor friends in the process of developing their English communicatio n, and facilitate discussion in English. In this heterogeneous environment, it seemed difficult for t he Japanese students to express differing opinions, but Tasks embedded in this instruction encour ages students to final goals. they gained the ability to create something new. The Taiwanese frien ds must have expended great effort to complete the final presentation and find ways to manage global, international classes.

REFERENCES

EDU-Port Japan (2020), last retrieved on July 2, from https://www.eduport.mext.go.jp/en/

Kageto, M. (2016). International Collaborative Learning, focusing on Asian English. *International Journal for Educational Media and Technology, 10*(1), 3–10 (1).

Kageto, M., Sato, S., & Kirkpatrick, G. (2012). How to enhance self-directed EFL learning in an authentic international collaborative learning. *International Journal for Educational Media and Technology, 6*(1), 76–84.

MEXT (Japanese education ministry) (2018), last retrieved on June 12, from http://www.mext.go.jp/a_menu/shotou/new-cs/1384662.htm

World Youth Meeting (1999–2020), last retrieved on February 13, 2020, from http://www.japannet.gr.jp/

Reigeluth, C. M., Beatty, B. J., & Myers, R. D. (Eds.). (2016). Instructional-design theories and models, Volume IV: *The learner-centered paradigm of education*. Routledge.

The House of Representatives in Japan. (2005). Questionnaires Regarding Taiwan on Atlases for Junior High School Use and on the Ministry of Foreign Affairs Website. http://www.shugiin.go.jp/internet/itdb_shitsumon.nsf/html/shitsumon/a163066.htm

Immersive video materials for standardized English-speaking tests: Development and ongoing application

Laura Maria Blanco Cortes
blanco.laura29@gmail.com
Doctoral student
Kyushu University
Fukuoka, Japan

Miharu Fuyuno
m-fuyuno@design.kyushu-u.ac.jp
Assistant Professor
Kyushu University
Fukuoka, Japan

Mikako Tomotari
tomotari@design.kyushu-u.ac.jp
Professor
Kyushu University
Fukuoka, Japan

This ongoing research is directed towards the development of immersive VR (Virtual Reality) materials for English standardized tests. Currently, computer-based standardized language tests have become a requirement to access education and employment opportunities worldwide. Nevertheless, standardized test-takers face issues related to anxiety, costs, and access, amongst others. We hypothesize that some of these issues could be solved effectively using VR materials. In order to test this hypothesis, we have undertaken the development and testing of 360-degree immersive video materials based on established computer-based English tests (i.e. EIKEN, GTEC, etc.). After analyzing existing tests, immersive videos and a first version of a VR application were successfully created. Subsequently, the application was tested with middle and high school-aged students. The trials revealed that the students were receptive to the equipment and most participants showed high rates of immersion. In the future, we hope to further develop the material presented in this article.

Key words: English Language Teaching, Computer Assisted Language Learning, Standardized Language Testing, Immersive Virtual Reality

INTRODUCTION

Language teaching has always been closely linked to technical tools. In the past decade, the discipline of Computer Assisted Language Learning (CALL) research has focused on multimedia materials, mobile tools, and the application of social media for language learning. However, one technological tool was just out of reach for some time: Virtual Reality (VR). At one point, VR technology was considered “too expensive, too cumbersome, or too unreliable” (Schwienhorst, 2002). However, this viewpoint has changed thanks to the introduction of readily accessible devices such as the Oculus Rift (a virtual reality headset) or the Google Cardboard, a cardboard viewer that can be connected to a smartphone to be used as a VR headset.

This recent introduction of VR technologies allowed people around the world to start creating VR software, creative works, games and many other resources. Research in immersive VR is still scarce due

to its recent growth. However, some studies have found success in implementing these technologies in various pedagogical fields including medical training (Harrington et al., 2018), cultural heritage education (Argyriou et al., 2017), and language learning (Madini & Alshaikhi, 2017).

Along with the success stories mentioned above, another common thread in VR research is its effect on anxiety. Some previous studies have focused on the therapeutic effects of VR for anxiety. Among many, some studies have focused on stress reduction for students (Camara & Hicks, 2019) and the impact of VR in anxiety disorders (Diemer et al., 2015). Moreover, VR environments can offer higher levels of standardization and structure, lower staff involvement and costs and the possibility to replicate the same situation anywhere and at any time. These aspects are directly beneficial to standardized testing.

Currently, standardized tests occupy an influential place in education systems around the world. Certainly, standardized university entrance exams and standardized language tests are a requirement to gain admission to most higher education programs. Nonetheless, standardized test takers encounter several issues related to access, student anxiety and standardization guidelines, among others. Current computer-administered testing solves problems related to scoring and reliability (Suvorov & Hegelheimer, 2014; Tokeshi, 2014) and some of the main considerations when transitioning to Computer-Assisted Language Testing (CALT) are that they provide greater efficiency, equivalence, and innovation

RESEARCH DESIGN & METHODS

After reviewing previous research, some issues that might be addressed by developing learning materials for VR could be recognized. The relevant issues are: 1) In VR research: Due to its relative novelty as a research field, it is valuable to continue studying usage options for VR tools in education. 2) In standardized testing: the studies cited have found that students experience test anxiety when they take computer-administered exams. This has been linked to exam room standards (noise), lack of familiarity with computers and exam costs.

We speculated that some of these issues might be successfully addressed through the design, development, and application of VR resources for standardized language testing. Specifically, since immersive technology could provide an experience that feels closer to a real-life speaking test, we speculated that issues with exam room noise and computer literacy might be alleviated through its implementation. To shed light on these speculations, we decided to apply VR testing materials and gauge student's reactions.

In this article we aim to describe the creation process of a VR speaking test simulation and the potential benefits and complications that might arise when employing a VR-based material. To address this issue, we performed a questionnaire survey with 21 EFL learners to gauge the target student's reactions and opinions about the viability of VR as a testing platform. The survey included questions focused on feelings of immersion and self-reported learner anxiety.

The material design process started by considering the needs of the potential target students. Students from middle and high school age were selected as the target since these are the ages during which students are most focused on taking and passing standardized language tests to gain access into higher education institutions. Therefore, in this case, to consider the user needs we must contemplate what is expected of the target students. Namely, Japanese students between the ages of 13 and 18. According to data compiled in 2018 by Sundai Preparatory Schools, most private and public universities in Japan, with some exceptions, require students to provide proof of having passed an English exam at the CEFR B1 proficiency level. [1]

Several standardized speaking tests designed for B1 equivalent levels were compared and analyzed. We settled on the EIKEN (実用英語技能検定) Grade Pre-2 as it is a widely employed test in Japan. According to a report by the Ministry of Education, Culture, Sports, Science and Technology, the EIKEN is one of the most popular tests in Japan with roughly 2.3 million test-takers in 2015 (MEXT, 2014).

At this point, the contents and learning goals were established. The EIKEN speaking test is uniquely well-suited to a Computer-based format because it has a precise sequence of events that are repeated exactly for every test taker. The speaking test is based around a card with a short English text and two illustrations. Its structure could be divided in 5 parts: greeting the interviewer, reading a text aloud, answering questions regarding the text, answering questions regarding the illustrations, and answering questions about personal opinions.

It was decided to create an EIKEN interview simulation for VR. After determining and studying the parts of the test, mock test cards in three variations were also created. Afterwards, an interviewer script was prepared based on the text and images of each card. The script detailed all the interviewer lines and the points where the cards and visual aids (such as countdown timers) should be included in the video editing process. Finally, a questionnaire was created to evaluate the material from the participants perspective. This questionnaire included questions related to previous English learning experience, their opinions on the experimental materials, feelings of anxiety and feelings of immersion.

Consequently, it was necessary to create the main audiovisual materials; 360-degree immersive videos. Immersive video allows for the development of high-definition immersive experiences without the need to create a virtual 3D space. Since this research project was produced by researchers with minimal programming knowledge, it was essential to employ beginner-friendly tools wherever possible. We had access to the following software and tools:

- a GoPro Fusion camera. The GoPro Fusion is a camera with two wide lenses (180 degree) placed on the back and front of a slim square device. The footage from both lenses is stitched

[1] The CEFR or Common European Framework of Reference for languages is a guideline for language proficiency. It is divided in 6 levels (A1, A2, B1, B2, C1, C2) with A being the basic user and C being the proficient user. Each level describes what a learner should be able to do in reading, listening, speaking, and writing.

together to create spherical photos and videos in 5.2K resolution. When viewing a spherical video with an HMD (head mounted display), the user can turn to look around themselves in any angle. Therefore, when recording spherical video, it is very important to consider the placement of the camera as the audience will be able to see everything around it. All crew and equipment other than actors must be hidden during recording.

- A lapel (or lavalier) microphone. A small microphone that clips to the speakers clothing, allowing for hands-free operation. Although the camera has a built-in microphone, we decided to record and sync audio separately to ensure a higher audio quality.
- Adobe Premiere Pro CC Pro. A video-editing software. At the time of development, this was the only software available to edit 5K, 360-degree video footage.
- Oculus Go Headsets. The Oculus Go is a portable, all-in-one VR HMD. It can be used without a computer and it is lighter and more portable compared to other headsets in the market.
- Unity. A software that allows users to develop 2D and 3D applications for a variety of purposes, mostly known for video-game development. Unity technologies offer a free version of the program for educational purposes.

A native English-speaking teacher unassociated with the research was hired to play the character of the interviewer. The three variations of the interview were recorded with the camera placed where the student might sit across a table. After recording, in the editing process, timer animations and test cards were added to the videos where necessary.

Figure 1. Screenshot of the immersive video interview.

With the simulation videos ready, a basic application was created in Unity. This allowed us to insert our videos into the Oculus Go within an application with dedicated menus. The application UI (User Interface) and design was created based on existing Computer-based examination software. When starting the application, students participating in the experiment would be presented with a short practice

section to learn how to manipulate the controls and practice answering the interviewer's questions naturally. Afterwards, they would be presented with one of the three variations of the interview at random.

The experiment was carried out in February of 2020 at a private combined all-girl's junior and senior high school in Fukuoka city. This was a private institution including a junior and high school on the same site and adhering to an independent curriculum. The participants were 21 female students with ages ranging from 13 to 17 years old. They had previously taken either the EIKEN Grade Pre-2 or Grade 3. This would place all participants at around the B1/B2 English proficiency level.

The participants were directed to a classroom where they took the mock test in groups of 3. They sat at 75 cm from each other in separate tables to simulate a test environment. They each had an Oculus Go headset and headphones. Additionally, a voice recorder was prepared to document their answers. The test lasted approximately 10 minutes in total and 10 additional minutes were allotted for the equipment set-up and the questionnaire. Three facilitators were present to help participants handle the equipment and deal with any technical difficulties. The HMDs were used in 10-minute intervals for approximately 3 hours with participants rotating every 20 minutes.

RESULTS

The results of the experiment are summarized below. The data presented here were collected from the participant questionnaires. The aim of the questionnaires in this experiment was to gauge the target student's reactions and opinions about the viability of VR as a testing platform. The questionnaires were divided in three main sections: material evaluation, feelings of immersion, and feelings of anxiety. Regarding the material evaluation, participants reported high satisfaction scores to the items related to the visual design, the appeal of the material, and its potential use as preparation for EIKEN. On the other hand, the participants expressed that the difficulty level, the operation of the UI and the operation of the equipment were too cumbersome or difficult, therefore awarding lower scores to these items (Figure 2).

1: Difficult	2: Slightly difficult	3: Just right	4: Slightly easy	5: Easy

	TOTALS
Q1：Contents	2.4
Q2：Menu operation (UI)	3.6
Q3：Device operation	3.3

1: Unsatisfactory	2: Slightly unsatisfactory	3: Neutral	4: Slightly satisfactory	5: Satisfactory

	TOTALS
Q4：As a preparation material for the Eiken	3.7
Q5：Content appeal (was it interesting?)	3.7
Q6：Visual design	3.8

Figure 2. Survey results: Material evaluation.

Based on this part of the survey, we identified some meaningful points to consider going forward. Even though more than half of the participants had taken the EIKEN test before, they found the content too difficult. Since the content of the test was not changed, we might consider this a reflection of the high difficulty of the original interview test. Nevertheless, it would be fitting to consider ways to adjust the difficulty level in future materials. Further research could be done on whether students express these same

feelings both after a traditional in-person speaking test and a VR-based test. Moreover, while the visual design received high praise, there was dissatisfaction regarding the operation of the UI menus. This leads us to consider, that although the UI design might have been satisfactory, the UX (User experience) design needs to be refined in future iterations.

Regarding the perception of immersion, the survey was designed based on The Spatial Presence Experience Scale (Hartmann, et al., 2016). This scale aims to estimate spatial presence and can be applied to diverse media settings. The items in the scale are divided in two categories: self-location and percieved possible actions in an enviromnment. According to our questionnaire results, in the case of our immersive speaking test simulation, the questions in the "Self-location" category were rated higher than the ones in the "possible actions" category. This disparity in results was anticipated.

As mentioned previously, the simulation developed in this research study uses 360-degree video and Oculus Go. Unlike more complex VR HMDs available in the market, the Oculus Go is a lightweight portable device. It is designed for stationary VR experiences; this means that it must be used sitting down. The user cannot walk around physically to move in the virtual space. Other systems make use of sensors and movement areas to allow for physical movement while wearing the headset (for example, walking, crouching, jumping, etc.). Furthermore, the 360-immersive videos are spherical, while it is possible to look around in the video, unlike a 3D virtual space, it is not possible to move around in the space. We anticipated that these conditions might affect the percieved possible actions within the immersive videos.

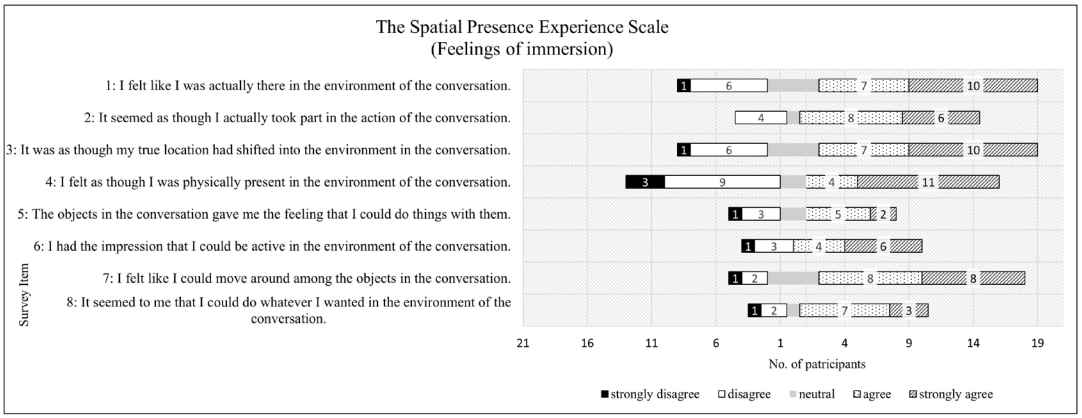


Figure 3. Survey results: Feelings of immersion.

However, according to the survey results, participants reported high levels of self-location: they felt as if they were truly inside that space with the teacher. Overall, even though participants did not feel like they could interact with the items within the video recordings, they felt like they could move and participate in the conversation. It was not necessary to create a complex 3D environment to develop a successful immersive experience.

Regarding the test anxiety portion of the questionnaires, more than half of the participants (57%) reported having felt anxiety during the experiment. Furthermore, 52% of participants reported anxiety during the interview portion of the experiment but none during the practice portion. The participating

students were aware that this was an experiment with no real repercussions on their academic performance. We might speculate that adding the words “practice” could have lowered the student’s anxiety. Observations from the facilitators and a cursory analysis of the recordings also indicated that most participants were able to speak in a loud enough voice even thought there were other students taking the test in the same room at the same time.

A chi-square test of independence showed that there was a significant association between students’ self-reported history of anxiety in English learning and anxiety experienced during the experiment X^2 (1, N = 21) = 10.5, p = .001. There was also a significant relationship between students who reported feeling anxious when speaking English in the past and students who reported feeling anxious in the VR interview portion of the experiment X^2 (1, N = 21) = 4.07, p = .04. Further statistical analysis was performed to determine if there was a relationship between the participants’ level of immersion and their self-reported anxiety. However, the chi-squared test showed there was no significant association in this case. Further research involving other anxiety measures (e.g., heart rate monitoring) could yield different results.

Finally, regarding participant’s comments, 28% of the participants stated that they had a good experience or that it was interesting. Some other improvement opportunities were also suggested: 33% of that participants reported problems with the image quality and 19% expressed that they would like to be able to pause and listen to the questions repeatedly. Regarding the latter 19% figure, it would be necessary to consider the purpose of the material. In the case of this research project, the aim was to create an experience as close to a face-to-face speaking test as possible; therefore, it would not be advisable to allow for repetition.

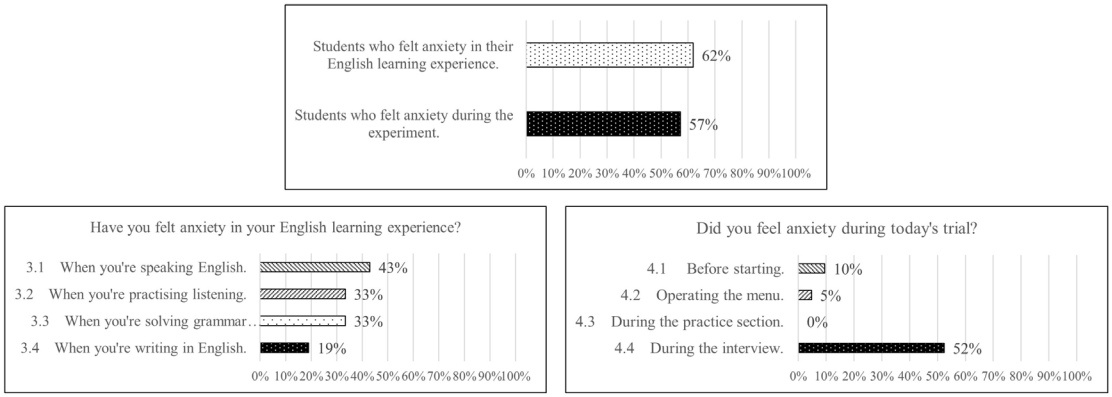


Figure 4. Survey results: Feelings of anxiety.

In this ongoing research study, it was possible to successfully develop an immersive virtual reality mock test using 360-immersive video with minimal software development knowledge. During the experiments, in general, the participants were receptive to the equipment. This was confirmed by the reported high levels of immersion and the fact that the students were able to answer questions in a loud voice even when physically sitting in a classroom with other classmates.

The numbers also indicated that more than half of the students felt anxious during the VR interview portion of experiment. In the future, VR based test environments could provide a sustainable option regarding easier access to tests and lower costs for students. Portable materials like the one presented in this article, could not only serve as a potential testing environment; they might also be used as test preparation tools for students with limited access to speaking practice opportunities. The equipment used in this experiment was lightweight and self-contained which meant it was easy to carry and set-up with a small team of facilitators. In the future, we hope to continue analyzing the findings from this study and applying VR testing materials in different configurations with varying kinds of learners. We hope that this will give us further insight into the best practices and requirements of VR learning material implementation.

ACKNOWLEDGMENT: This work was supported by JSPS KAKENHI Grant Number 16H03079 (Grant-in-Aid for Scientific Research (B)).

REFERENCES

Argyriou, L., Economou, D., & Bouki, V. (2017, July 10). 360-degree interactive video application for Cultural Heritage Education. 3rd Annual International Conference of the Immersive Learning Research Network, Coimbra, Portugal. https://dx.doi.org/10.3217/978-3-85125-530-0

Camara, D. R., & Hicks, R. E. (2019). Using virtual reality to reduce state anxiety and stress in university students: an experiment. GSTF Journal of Psychology (JPsych), 4(2), 15–15.

Diemer, J., Alpers, G. W., Peperkorn, H. M., Shiban, Y., & Mahlberger, A. (2015). The impact of perception and presence on emotional reactions: A review of research in virtual reality. Frontiers in Psychology, 6. https://doi.org/10.3389/fpsyg.2015.00026

Harrington, C. M., Kavanagh, D. O., Quinlan, J. F., Ryan, D., Dicker, P., O'Keeffe, D., Traynor, O., & Tierney, S. (2018). Development and evaluation of a trauma decision-making simulator in Oculus virtual reality. The American Journal of Surgery, 215(1), 42–47. https://doi.org/10.1016/j.amjsurg.2017.02.011

Hartmann, T., Wirth, W., Schramm, H., Klimmt, C., Vorderer, P., Gysbers, A., Böcking, S., Ravaja, N., Laarni, J., Saari, T., Gouveia, F., & Maria Sacau, A. (2016). The Spatial Presence Experience Scale (SPES): A Short Self-Report Measure for Diverse Media Settings. Journal of Media Psychology, 28(1), 1–15. https://doi.org/10.1027/1864-1105/a000137

Madini, A. A., & Alshaikhi, D. (2017). Virtual Reality for Teaching ESP Vocabulary: A Myth or A Possibility. International Journal of English Language Education, 5(2), 111–126. https://doi.org/10.5296/ijele.v5i2.11993

Ministry of Education, Culture, Sports, Science and Technology. (2014). 英語力評価及び入学者選抜における英語の資格・検定試験の活用促進に関する連絡協議会の設置について.https://www.mext.go.jp/component/b_menu/shingi/giji/__icsFiles/afieldfile/2015/03/25/1356121_02.pdf

Schwienhorst, K. (2002). The State of VR: A Meta-Analysis of Virtual Reality Tools in Second Language Acquisition. Computer Assisted Language Learning, 15(3), 221–239. http://dx.doi.org/10.1076/call.15.3.221.8186

Suvorov, R., & Hegelheimer, V. (2014). Computer-Assisted Language Testing. In the Companion to Language Assessment (First Edition). John Wiley & Sons.

Tokeshi, M. (2014). TOEFL iBT におけるスピーキング測定とライティング測定の妥当性,信頼性,実現性の検証 [Examination of the Validity, Reliability and Practicality of the Speaking and Writing Test or TOEFL iBT]. 名桜大学紀要 THE MEIO UNIVERSITY BULLETIN, 19, 65–76.

TCC: 25 Years of an Evolving Online Conference

Bert Y. Kimura
bert@hawaii.edu
Professor Emeritus
University of Hawaii
Honolulu, Hawaii, USA

Curtis P. Ho
curtis@hawaii.edu
Professor
University of Hawaii
Honolulu, Hawaii, USA

Kitty Hino
hinok@hawaii.edu
University of Hawaii
Honolulu, Hawaii, USA

For 25 years, The TCC Online Conference brought together higher education faculty, staff, and students globally to discuss emerging technologies, best practices, and concerns about teaching and learning with technology. In 2020, this event was especially meaningful during the COVID-19 pandemic as many institutions of higher learning closed campuses and transformed into online learning to complete the semester. This paper highlights the 2020 conference and evaluation results completed by participants. Survey data collected over the past 15 years in benchmarked five-year intervals (2010, 2015, and 2020), were reviewed for similarities and differences along with identifying key ideas for continuing into this new decade.

Keywords: online learning, online conference, e-learning, educational technology, coronavirus, COVID-19

INTRODUCTION

Event purpose. In 1995, Professor James Shimabukuro created this online or virtual event to overcome difficulties that faculty in Hawaii encountered with local budget reductions, high travel costs, and the difficulty in receiving approval for participating in professional development activities, typically offered by various professional associations or other higher education institutions on the mainland USA. Thus, this event was designed for faculty, staff, and administrators in higher education worldwide to share their expertise and engage in productive forums about innovations and practices that accompany the use of technology in teaching and learning (Kimura & Ho, 2016). In brief, this event continues as a global professional development activity. Participants engage with presenters from their home, work office, or any convenient location, such as a local cafe. Internet access is required. TCC is among the earliest and is the longest running virtual conference (Anderson, 1996)

Technology history. TCC started with email lists, Gopher, then added multi-user dungeon object oriented (MOO) interactivity, Internet Relay Chat (IRC), and transitioning to interactive video conferencing in association with LearningTimes.com. Today, the conference uses an interactive website for discussions along with Adobe Connect and ZOOM conferencing technologies. University of Hawai'i master's degree students present their final project at the end of each day. All participants are required to register as individuals or with large group licenses that allow an unlimited number of participants from a single department, campus, or system.

Twenty-fifth anniversary. To celebrate the 25th anniversary, the conference featured 24 plenary sessions in a single day, "One Day in the Life of TCC," scheduled for each hour of the entire day. These presentations were open to anyone interested who could attend these sessions during normal working hours no matter where the participant lived around the globe (TCCHawaii.org, Apr. 8).

Purpose of this paper. Over the past 25 years, conference organizers used an evaluation instrument that contained the same question items year after year. This instrument has continued to produce consistent and comparable data over time. Previously, the authors published papers relevant to evaluation data from 2006 through 2015 (Kimura & Ho, 2016; Ho, Boulay & Kimura, 2011). This paper summarizes and analyzes comparative data for the most recent five-year period. Thus over a 15-year period, 2010, 2015 & 2020 were defined as "benchmark" years. Additional comments are presented that summarizes faculty, staff and students' perceptions of the impact of COVID-19 (coronavirus) pandemic as it spread throughout the world during this time.

RESEARCH DESIGN & METHODS

Evaluation Data. A Google form questionnaire was sent by email to all registered participants a few days after the annual event to solicit their assessment and feedback. A reminder was sent after the initial due date extending the deadline for one week. Upon completing the survey, participants were allowed to submit their email addresses for a random drawing of two $15 USD gift certificates. The participant's identity was disregarded and not factored into the data analysis.

The TCC 2020 online evaluation questionnaire consisted of 45 fixed-response items including 5-point Likert-type questions (Strongly disagree – Neutral – Strongly agree), 4-point rating questions (Poor – Fair – Good – Excellent), and multiple-response (check all that apply) items. In addition, there were five open-ended questions included to gather qualitative and longer, more meaningful responses.

Data from these surveys were transferred into a spreadsheet. Seven items were selected for comparative purposes. For each Likert-type item, positive responses were grouped (Agree + Strongly agree and Good + Excellent) and percentages determined over total responses. The data includes participant registration numbers and the number of completed questionnaires.

COVID-19 Pandemic. In light of the ongoing coronavirus pandemic, the 2020 questionnaire included eight statements about faculty perceptions of the pandemic along with one open-ended question about participant experiences and views on the impact on higher education.

RESULTS

We report quantitative data from the past five consecutive TCC Worldwide Online Conferences in Tables 1-3. Data for 2005-2015 were published and analyzed earlier (Ho, Kimura, & Boulay, 2011; Kimura & Ho, 2016). A complete report of all items is available online (TCCHawaii.org, 2020, July 8).

The number of registered participants varied from year-to-year, with a high of 1012 in 2016 and a low of 525 in 2019. The average was 708 for the past five years (Figure 1). Responses to the evaluation questionnaire averaged 17% for the period 2016-2020. In the five years prior, the average number of responses, 13%, was lower (Kimura & Ho, 2016).

Table 1 includes five key indicators for a successful online conference. Table 2 summarizes responses to statements about the coronavirus pandemic and faculty perceptions of its impacts on teaching and learning. Table 3 provides a comparison of conference success indicators over three benchmarked periods.

Figure 1. TCC Conference Participants and Evaluation Questionnaires Completed

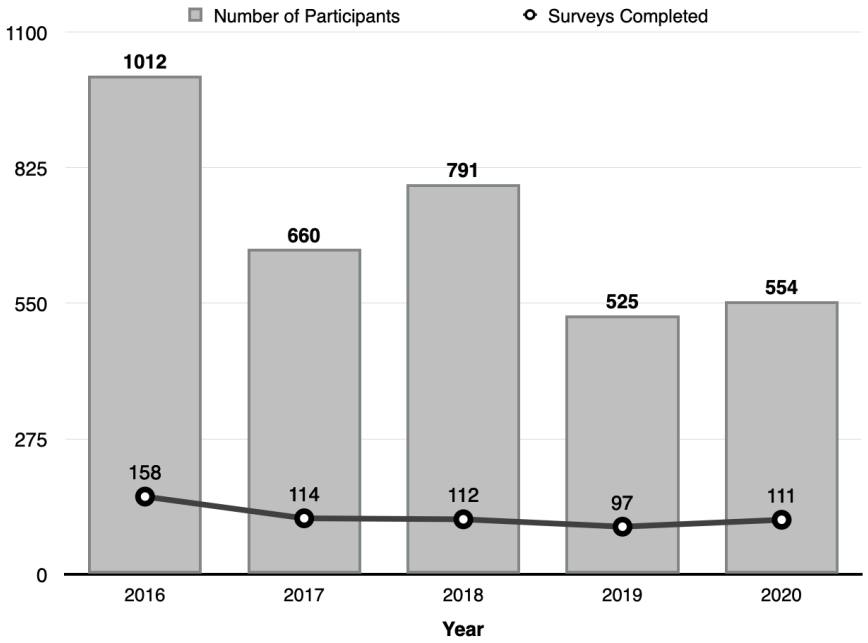


Table 1.

TCC Evaluation Survey Data, 2016-2020

Item	**Response type**	**2016**	**2017**	**2018**	**2019**	**2020**
Participants		1012	660	791	525	554
Survey Respondents		158	114	112	97	111
Content quality	R	98.6%	92.2%	99.0%	98.8%	95.4%
Conference theme	L	94.3%	95.6%	97.3%	93.6%	97.3%
Feeling of belonging to a community	L	67.1%	66.7%	75.0%	71.3%	77.5%
Interaction with others	L	98.5%	98.9%	92.7%	85.9%	91.3%
Important for professional development	L	98.7%	99.1%	98.1%	93.5%	94.3%

Note: L = Represents a Likert scale item, added total of Strongly Agree and Agree (%A+%SA); R = Represents positive ratings that combine Excellent & Good data (%G+%E) for item rated Poor-Fair-Good-Excellent.

Table 2.

TCC 2020 Evaluation Survey Data – Responses to COVID-19 Statements

Item	**SD**	**D**	**NC**	**A**	**SA**	**TOT**	**POS**
	Strongly Disagree	**Disagree**	**No Change**	**Agree**	**Strongly Agree**	**Total**	**%A+ %SA**
Online classes will be more prevalent.	0 (0.0%)	4 (3.6%)	4 (3.6%)	50 (45.5%)	52 (47.3%)	110	92.7%
Online classes will become more global	0 (0.0%)	2 (1.8%)	11 (10.0%)	52 (47.3%)	45 (40.9%)	110	88.2%
Online classes will increase in quality	0 (0.0%)	7 (6.4%)	9 (8.3%)	54 (49.5%)	40 (36.0%)	110	85.5%
Online classes will gain a higher reputation.	0 (0.0%)	6 (5.5%)	11 (10.0%)	52 (47.3%)	41 (37.3%)	110	84.5%
Online learning will be more accessible from home	0 (0.0%)	1 (0.9%)	12 (10.9%)	53 (48.2%)	44 (40.0%)	110	88.2%

Online teaching and learning will be more highly respected.	0 (0.0%)	4 (3.6%)	20 (18.2%)	43 (39.1%)	43 (39.1%)	110	78.2%
Everything will be the same as before.	41 (37.6%)	45 (41.3%)	14 (12.8%)	5 (4.6%)	4 (3.7%)	109	8.3%
New forms of online learning will emerge	0 (0.0%)	3 (2.7%)	3 (2.7%)	56 (50.9%)	48 (43.6%)	110	94.5%
Note: POS = Sum of the positive responses by combining Agree and Strongly Agree (%A+%SA)							

Table 3.

Comparison of Benchmarked Periods for Conference Success Indicators

Period	**2006 –2010**		**2011 – 2015**		**2016 – 2020**	
Item	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Content (R)	97.4%	1.2	96.2%	2.4%	96.8%	3.0%
Theme (L)	96.0%	4.6	96.0%	3.5%	92.2%	1.7%
Belong to community (L)	78.5%	3.8	75.2%	8.0%	75.3%	4.8%
Interaction (L)	84.9%	3.4	83.4%	5.6%	94.0%	5.4%
Prof. development benefit (L)	—	—	93.6%	8.5%	96.7%	2.6%
Note: L = Represents a Likert scale item, added total of *Strongly Agree* and *Agree* (%A+%SA); R = Represents ratings that include *Excellent & Good* combined. Each period includes evaluations compiled over a five-year period.						

DISCUSSION

TCC has consistently conducted a quality professional online conference over 25 years as participants have affirmed by responding to end-of-conference evaluation questionnaires. In this section, data from the past five years (2016-2020) are compared to two previous five-year periods (2006-2010; 2011-2015) presented in earlier papers (Ho, Kimura & Boulay, 2011; Kimura & Ho, 2016).

Respondents continue to rate the content quality extremely high. More than 96% of the responses are in the "excellent" and "good" categories, which is identical to the previous two periods. The ratings for how relevant the conference theme is to teaching and learning were also very high with a mean value of 92.2% for responses in the “strongly agree” and “agree” categories over the past five years.

In a virtual conference, participants depend on audio and visual stimuli while having minimal access to non-verbal communications. Thus, the sense of belonging to a community of learners is an

important indicator. From the beginning, TCC coordinators monitored responses to this category, which averaged over 75% during the past 15 years, suggesting success in this area. The value of interactions with presenters and other participants is an added measure of this sense of belonging to a community. In this regard, positive response rates over 80% were recorded for interacting with others during the 15-year period.

Participants perceiving that this event benefit their professional development is an important goal. Over the past ten years, results show that a high correlation, greater than 90%, to meeting this goal (Table 3).

Due to the rapid expansion of online technologies and proliferation of distance learning in recent years, educators probably view an online conference as ordinary, and not especially unusual. This certainly was not the case in the early years of TCC.

As networks became more reliable and responsive globally, technical problems such as connectivity and user error decreased. Among the responses received was the preference of participants to use Zoom for conferencing in contrast to Adobe Connect by a 2:1 ratio (TCCHawaii.org, July 8). Participants also mentioned time zone issues with a schedule presented in Hawaiian Standard Time. Overall, this difficulty was mentioned less frequently as academic faculty have become more aware of the global nature of technology. Conference coordinators continue to reach out and include colleagues in Asia and Europe through personal contacts and academic conferences sponsored by the organizations such as Association for Educational Communications and Technology (AECT) and the Japan Association for Educational Media Study (JAEMS).

COVID-19. Due to the sudden appearance of the coronavirus pandemic declared by the United Nations World Health Organization (WHO) on March 11, 2020 (WHO, 2020), universities in America, including the University of Hawai‘i moved to complete spring semester classes through online delivery (UHNews, 2020).

Respondents to the TCC 2020 evaluation questionnaire overwhelmingly agreed that the coronavirus pandemic will change the nature of online teaching and learning. Online classes will be more prevalent, more global, increase in quality, become more reputable, more accessible from home, gain respect and new forms of learning may emerge. The participants were emphatic that teaching and learning will no longer be the same (Table 2). Professor Aydin from Anadolu University, Turkey (Torigoe, 2020) and Professor Suzuki from Kumamoto University (Suzuki, 2020), Japan, while presenting plenary sessions during the “One Day in the Life of TCC,” mentioned how an elementary school and a national academic conference, respectively, quickly pivoted toward online delivery. The University of Hawai‘i converted all classes to e-learning mid-semester due to a statewide lockdown and work-from-home directive issued by state and local leaders (UH News, 2020).

CONCLUSION

In summary, evaluation data compiled for this event since 2006 showed that key conference indicators: content, theme, community, interaction were consistently high as the previously shown (Kimura & Ho, 2016; Ho, Boulay & Kimura, 2011). Participants continued to express that this event is valuable for their own professional development. Throughout 25 years, TCC has delivered an opportunity for higher educators to participate in a high quality, global professional development event.

Overall, TCC presents a wide variety and quality conference sessions. The conference organizers continue to promote a wide range of themes with the help of a volunteer Advisory Panel. All sessions are recorded and archived, thus providing a useful repository of best practices in the use of technology for teaching, learning, and creative expression consistent with 21st Century learning skills (Common Sense Education, 2016).

Looking forward, conference organizers will expand participation by Asian, Australian, European and African postsecondary faculty and graduate students to facilitate information exchange and intercultural collaboration in learning technologies. Graduate students from the University of Hawai‘i, Kansai University, and elsewhere have impressed conference organizers through their interesting, high quality, and trending presentations. A bright future awaits!

ACKNOWLEDGEMENTS

The authors express their gratitude to all presenters and participants at the TCC 2020@25 Online Conference and years prior. This event was made possible with the help of numerous faculty and staff volunteers worldwide. Additional support was provided by the Wo Learning Champions to enable unlimited participation by University of Hawai‘i community college faculty, staff and students.

REFERENCES

Anderson, T. D. (1996). The Virtual Conference: Extending Professional Education in Cyberspace. International Journal of Educational Telecommunications 2(2): 121-135.

Common Sense Education. (2016, July 12). What are the 4Cs? [Video]. YouTube. https://youtu.be/QrEEVZa3f98

Ho, C. P., Kimura, B., & Boulay, R. (2011). Retrospective analysis of a virtual worldwide conference for eLearning. International Journal for Educational Media and Technology 2011, 5(1), 107-117. http://jaems.jp/contents/icomej/vol5/IJEMT5.107-117.pdf

Kimura, B. Y. & Ho, C. P. (2016). The TCC Worldwide Online Conference: Twenty years of affordable, timely professional development. *International Journal for Educational Media and Technology. 10*(1), 18-25. http://jaems.jp/contents/icomej/vol10/2_Kimura.pdf

Suzuki, K. (2020, April). Japanese Society 5.0 and Educational Technology Research. *TCC 2020@25 Online Conference*. Plenary address presented online. Retrieved from https://2020.tcconlineconference.org/plenary-16/

TCCHawaii.org (2020, April 8). TCC 2020@25, One Day in Our Life – Free Plenary Sessions [Blog post]. Retrieved from https://tcchawaii.org/2020/04/08/tcc-202025-one-day-in-our-life-free-plenary-sessions/

TCCHawaii.org (2020, July 8). TCC 2020@25 Evaluation Summary [Google Document]. Retrieved from https://bit.ly/2020eval-summary

Torigoe, H. (2020, May 18). Covid-19 moving a school online. TCCHawaii.org. Retrieved from https://tcchawaii.org/2020/05/18/covid-19-moving-a-school-online/

UH News. (2020, March 12). University of Hawai‘i actions to address COVID-19 pandemic. Retrieved from https://www.hawaii.edu/news/2020/03/12/uh-actions-address-covid-19/

World Health Organization. (2020, March 11). WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020. *World Health Organization*.

Discussions of Diversity and Understanding: A Faculty Training Pilot on Online Microaggression

Kae Novak
novak.kae@gmail.com
Ph.D. student
University of Colorado - Denver
Denver, USA

Online microaggression continues to be a barrier faced by instructional designers and online educators who strive to develop and support inclusive online environments. Many institutions look to their student codes of conduct or netiquette policies; however, these policies may not sufficiently address the full range of online incivility. Many higher education institutions do not specifically address the constructs of microaggressions, online disinhibition, online incivility, and implicit bias online in their policies or take proactive steps to prevent a non-inclusive environment online. This pilot addressed the problem of practice, which is how can we train online faculty to recognize these issues and take proactive steps in preventing a non-inclusive or chilly learning environment?

Key words: online microaggression, online incivility, hyper-politeness, chilly climate

INTRODUCTION

Online microaggression continues to be a barrier faced by online educators who strive to develop and cultivate diversity and cultural awareness in online environments. Many institutions look to their student codes of conduct or netiquette policies; however, these policies may not sufficiently address the full range of online incivility that can occur. This study reports on an exploratory pilot with online educators and instructional designers that attempted to address the problem of practice, which is how can we train online faculty to recognize these issues and take proactive steps in preventing a non-inclusive or chilly learning environment?

Over the past twenty years, online learning has represented a strategic area of growth for institutions of higher education (McPherson & Bacow, 2015). Online learning provides additional delivery channels that increase access for students, particularly in community colleges where many students are juggling full-time work, growing families, and pursuing their educational goals. Many online learning courses rely on class discussions to engage students, assess deeper learning of topics, and promote virtuous discourse. However, online discussions are also a space where online microaggressions

show up. Online learning, especially asynchronous discussion forums are often regarded as a neutral area that anonymize students, but they are not (Baker et al., 2018). In these educational discussion forums, we do see online microaggression (Wright Carroll & Hoekman, 2014).

Microaggressions are "brief and commonplace daily verbal, behavioral or environmental indignities, whether intentional or unintentional, that communicate hostile, derogatory or negative... slights" (Sue, et al., 2007, p. 272). The original research from Sue et al. (2007) focused on race but the research on microaggression has been expanded to include gender, heteronormative bias, religious intolerance, and the intersectionality of multiple identities (Nadal 2008; Nadal et al., 2015). Wright Carroll and Hokeman (2014) did further research to recognize microaggression in online courses.

Studying this problem of practice would extend the understanding of microaggression in online courses to the setting of higher education courses. Since "relatively little is known about equity in online learning environments" (Baker et al., 2018, p. 3) this research study could extend what is known about creating an inclusive educational environment online. As a problem of practice, online microaggression should be included in professional development to increase educational equity. According to McPherson and Bacow (2015) there is greater use of online learning at "less-prestigious and less-selective institutions, including the 'non-research' public universities and community colleges" (p. 139). McPherson and Bacow (2015) "broad-access unselective institutions are already among the largest users of online instruction. … and they disproportionately educate lower-income students and students of color" (McPherson & Bacow, p. 149). Additionally, Baker et al. (2018) listed the significance of their study to be what they believe was the first evidence of the possible presence of racial and gender bias among students and instructors in online courses. They found "instructors are 94% more likely to respond to forum posts by white male students" (Baker et al., 2018, p.2) than any other demographic in their 124 massive online open course data set.

Another factor that is in play in online asynchronous discussion forums is the online disinhibition effect (Suler 2005; Rose 2014). The online disinhibition effect is online behavior that breaks social norms associated with self-presentation and a lack of concern of the judgement of others (Rose, 2014). It is exacerbated by the lack of "paralinguistic cues" (Rose, 2014, p. 253). This can lead to microaggressions that would not happen in a face-to-face course. As a reaction to the combination of microaggression and online incivility, other students may respond with "excessive niceness" (Rose, 2014,

p. 258) which can also contribute to the stifling of student engagement in the only forum they have for building community in an online course.

RESEARCH DESIGN & METHODS

In reviewing the literature to develop this study, the focus was on how online educators can create learning interventions and strategies. The pilot design was drawn from the four frameworks reported by Benson (2018) "1) critical frameworks, 2) culture-based frameworks, 3) traditional IT frameworks, and 4) identity-based frameworks" (p. 3) in learning, technology, and culture. This study assessed different vignettes that presented online microaggression as a problem of practice. For this pilot project, qualitative methods of observation, field notes, and transcription of the audio recording of the session were used to collect and triangulate data. Open coding was used to analyze collected data to determine emergent categories, patterns, and themes (Saldana, 2016).

RESULTS

This study reports on an exploratory pilot with online educators and instructional designers that attempted to address the problem of practice, which is how can we train online faculty to recognize these issues and take proactive steps in preventing a non-inclusive or chilly learning environment? The themes that emerged from this pilot were that while the participants were familiar with the term chilly climate in STEM subjects, as it pertained to female students, they had not considered how a chilly climate could develop through the discussion boards in their online classes. The vignettes were based on actual episodes of online microaggression and incivility in an American college system. A student code of conduct and netiquette rules based on several American institutions was provided to participants during the training. One of the participants expressed incredulity that anything like this could or would happen in their online course. Three of the participants expressed that they had never seen microaggressions in their online classes but were curious about how to deal with it, if it did happen. The other eight participants agreed that they had seen microaggression in their online courses.

Based on the discussions during the sessions, the themes that emerged from the educators were that of emotionality and perplexion. For example, one participant expressing emotionality after reading a vignette expressed "I would write a response but I wouldn't send it because there is no way it wouldn't sound angry, because this [the student post] does make me angry. Another participant after reading one

of the vignettes said, “If this happened in my [online] class, I would need to get up from the computer and walk around before I responded. I’m sure I would be pacing the hallway or get up to walk around campus”. Perplexion was expressed by several of the participants who felt unable to respond without first consulting with their supervisor or a student affairs specialist. For example, one participant responded, “This is beyond the scope of anything I was trained to deal with”. Another participant said, “The first thing I would do is forward this to my supervisor and also consider sending this as a student of concern report to the student’s advisor”.

DISCUSSION AND LIMITATIONS

While most of the educators had seen incivility in their online courses, they found it to be insulting that a student would respond in similar fashion to the example texts in their online course. They had not considered or heard of the online disinhibition effect (Suler, 2005). This was most apparent in their comments on expectations of civility being the same online as in face-to-face courses. While in their online courses all students are public, only two of the online educators required actual photographs of the students be uploaded. This may have led to the dissociative anonymity and invisibility components of online disinhibition effect (Suler, 2005) which was discussed as “posting a microaggression or incivil comment” and not knowing or caring about the other student who was the target. Asynchronicity as reported by Suler (2005) was also brought up as a major factor in the occurrence with students having the ability to immediately log out to the course after taking action. All participants agreed that they had not considered that hyper-politeness and overly submissive language could be an indicator that a microaggression had chilled participation in discussion. There was also agreement from ten of the participants that they would need to analyze incivility, hyper-politeness and microaggressions in their courses and take measures to ensure this did create a chilly climate for their students.

This pilot has several limitations. The findings are based on eleven American educators who teach online in different higher education subject areas. These eleven educators chose to participate in a professional development session focused on online microaggression, so the participants already had an interest and quite possibly a frustration with the topic that might not be shared with other online educators. However, based on the pilot and the research findings demonstrated a need for further research in designing participatory discussion that enhances diversity and cultural awareness.

REFERENCES

Baker, R., Dee, T., Evans, B., & John, J. (2018, March). *Bias in online classes: Evidence from a field experiment*. Stanford, CA: Center for Education Policy Analysis. Retrieved at https://cepa.stanford.edu/sites/default/files/wp18-03-201803.pdf

Benson, A. D. (2018). A typology for conducting research in culture, learning, and technology. *Tech Trends*, 1-7. doi: 10.1007/s11528-018-0267-8

McPherson, M., & Bacow, L. (2015). Online higher education: beyond the hype cycle. *Journal of Economic Perspectives, 29*(4), 135-54. doi: 10.1257/jep.29.4.135

Nadal, K. L. (2008). Preventing racial, ethnic, gender, sexual minority, disability, and religious microaggressions: Recommendations for promoting positive mental health. *Prevention in Counseling Psychology: Theory, Research, Practice, and Training, 2*, 22–27. Retrieved from http://www.div17.org/preventionsection/Prevention_Pub_08.pdf

Nadal, K. L., Davidoff, K. C., Davis, L. S., Wong, Y., Marshall, D., & McKenzie, V. (2015). A qualitative approach to intersectional microaggressions: Understanding influences of race, ethnicity, gender, sexuality, and religion. *Qualitative Psychology, 2*(2), 147-163. http://dx.doi.org/10.1037/qup0000026

Saldana, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). Thousand Oaks, CA: Sage Publications Inc.

Sue, D. W., Capodilupo, C. M., Torino, G. C., Bucceri, J. M., Holder, A. M. B., Nadal, K. L., & Esquilin, M. (2007). Racial microaggressions in everyday life: Implications for clinical practice. *American Psychologist, 62*(4), 271-286. doi: 10.1037/0003-066X.62.4.271

Suler, J. (2005). The online disinhibition effect. *International Journal of Applied Psychoanalytic Studies, 2*(2), 184-188. doi:10.1002/aps.42

Wright Carroll, D., & Hoekman, A. (2014). Recognizing and reducing microaggressions in online courses [PDF document]. *Summer Institute on Distance Learning and Instructional Technology*, Overland Park, KS: Johnson County Community College. Retrieved from https://scholarspace.jccc.edu/cgi/viewcontent.cgi?article=1089&context=c2c_sidlit

Online teaching practice of public elective courses based on "inquiry learning and open access"

Cui Huawei
cuihuawei820303@163.com
lecturer
Zhongkai University of Agriculture and Engineering
Guangzhou, China

Miao Aimin
905695485@qq.com
Associate Professor
Zhongkai University of Agriculture and Engineering
Guangzhou, China

"Plant seeds in literary works" is a public elective course for undergraduates in Zhongkai University of Agriculture and Engineering. There are 16 class hours, 135 students this semester. The course used online teaching tools (Campus Network + “Rain Classroom” App + QQ chat tool). In addition to combining the advantages of different teaching tools, there are several innovation designs as follows: (1) Inquiry learning. The core of the course is to ask students to use the knowledge and methods learned in class to observe a plant or seed, and then write a popular science article. Results showed that students could use the knowledge and skills they had learned to write some superior articles, for example, a student described the strawberry knowledge in classical Chinese, some students majoring in Japanese language wrote an article about "plant seeds in Japanese comics" and so on. (2) Teacher and students work together. "Example is better than precept". As a teacher, during the teaching period of nearly half a year, I published six popular science articles in magazines. These practices set up a good example for students and stimulated their interest and enthusiasm for creation. (3) Online display. I commented on the students' works on the Internet and showed excellent works online to inspire students’ sense of honor. Finally, the works of 28 students were selected as "excellent works", which were uploaded to the Internet for everyone to read and download. Results showed that the above methods effectively stimulated the students’ passion and interest in class. After many students submitted their homework, they spontaneously made a second revision and submitted it again, expected to be rated as "excellent works".

Key words: Online teaching, Inquiry learning, Popular science writing

INTRODUCTION

Inquiry learning, also known as research-based learning, is a student-centered learning mode. It is a learning method mainly plan, implement and self-assessment by students with the assistance of teachers. Because college students have a certain accumulation of professional knowledge, practical experience and self-learning ability, through the professional guidance and help of teachers, students' creative thinking can be cultivated (Luo et al., 2017). Inquiry learning is the result of the deepening of modern education concept, and it is an innovative educational method and concept which is different from traditional methods. Inquiry learning emphasizes that students can form independent inquiry, innovative consciousness and practical ability to deal with problems in problem situations, which can directly

accumulate practical experience and enrich knowledge. At the same time, it is also a learning strategy and learning method (Lin, 2018).

Some domestic scholars have done a lot of research on “inquiry learning”. Professor Zhang Jianlin introduced and analyzed the learning experience of basic physics course of Huazhong University of Science and Technology and the innovation base of electrical and Electronic Science and technology of Huazhong University of Science and Technology (Zhang, 2002). Zhang summarized the practical experience of some universities (such as Tsinghua University and Zhejiang University) in the aspect of “inquiry learning” (Zhang, 2006). In 2010, the Department of higher education of the Ministry of education of the people's Republic of China compiled and published the research and demonstration of “inquiry learning” and cultivation of innovative ability, which compiled the achievements of several higher education teaching reform research projects, and elaborated the theory and practice of "inquiry learning" in the cultivation of innovation ability of Peking University, Shanghai Jiaotong University, Jilin University, Huazhong University of Science and Technology.

Some foreign translation works on teaching reform also put forward a lot of operational suggestions on “inquiry learning” from the micro level. Focusing on Research: A Teacher's Guide to the Implementation of Inquiry Learning, compiled by the Teaching Research Center in Alberta, Canada, elaborated the definition of inquiry learning, the creation of inquiry learning culture, the inquiry learning mode, the integration of inquiry learning mode and curriculum, the design of inquiry learning activities, and the operation guide for each stage of inquiry learning mode [5]. In the field of medical education, Grandis, Glasgow and Jackson edited the Basic Research of Nursing: the Application of Inquiry Learning, which specially discussed the practice of inquiry learning in medicine (Zhang, 2006).

Nowadays, many countries in the world have carried out practical research on curriculum reform and students' autonomous inquiry learning around the reform goal of learning style transformation. Although the concept of inquiry learning is different in different countries, the curriculum itself is also different. However, the research and exploration of students' innovative ability and practical ability has become the main melody of world education reform and development (Zhao, 2017).

There are many forms of inquiry learning. Generally speaking, students acquire knowledge, draw conclusions and form products through practical activities (such as observation, investigation, interview, experiment, design, production, evaluation, etc.) that they participate in, instead of teachers directly teaching the ready-made knowledge and conclusions to students through transfer teaching, all belong to inquiry learning.

In the past, “inquiry learning” was mostly carried out by forming students teams to participate in scientific research, such as the undergraduate research and training program (SRT) launched by Tsinghua University and the scientific research program for college students (SRTP) implemented by Zhejiang University (Zhang, 2006). This course attempts to introduce the “inquiry learning” mode in the public elective course "plant seeds in literary works" to explore the combination method of “inquiry learning” and public elective course, to achieve better classroom teaching effect.

RESEARCH DESIGN & METHODS

Because of special circumstances, this course adopts online teaching (Campus Network + Rain Classroom App + QQ online chat tool) this semester, and uses the authority of campus network to issue syllabus, teaching plan, courseware, and student excellent works; uses the convenience of "Rain Classroom" to conduct online teaching, exercises issue and feedback collection; and uses QQ online chat room to discuss online, answer questions, etc. In addition to using the above tools to carry out online teaching, this research also has the following innovative designs:

(1) Inquiry learning. In addition to online teaching, the core of the course is to allow students to combine their knowledge and methods to observe a plant or seed, and then write a popular science article. The number of words is required to be 800 words. Photos are encouraged.

(2) Teachers participation. At the same time, the teacher not only explains literature collection, plants observation and anatomy, and literary and artistic creation, but also observes plant seeds and carries out popular science creation, so as to set an example for students and stimulate their interest in participation and creativity.

(3) Based on the public display effect of online teaching, this course plans to make public comments on students' works, and finally select the works of 28 students as "excellent works" and upload them to the Internet.

RESULTS

The results showed that the above methods could effectively stimulate students' enthusiasm and interest in learning. The attendance rate of students in elective courses reached 100%, and the average number of visitors who did not choose this course was 14. The students' attitude was positive and serious, which was reflected as follows:

(1) Students could use the methods and skills learned in class to observe and describe plants or seeds scientifically. Each person took original pictures (such as pictures of the process of exploring the internal structure of plants, and pictures of the morphology of plants and seeds). Three students also drew the plant morphology and structure by hand.

(2) Words of all students works exceeded the minimum requirement (800 words), and 1/3 of them wrote about 2000 words. After handing in their homework, 31 students spontaneously revised and submitted their homework again, looking forward to present their homework "perfectly" on the Internet.

(3) Students could use the knowledge and skills they have learned to write high-level popular science articles. They could use a variety of artistic techniques to express their feelings naturally in the

narration. For example, some students described strawberry knowledge in classical Chinese; some students majored in Japanese summarized the seed knowledge in Japanese comics. In addition, many students integrated family affection and plant humanistic knowledge into their works, which could effectively stimulate their love for their families and hometown.

In a word, “inquiry learning” can mobilize the enthusiasm and initiative of college students, while online comments and open access of students' homework can further improve their enthusiasm and initiative. The whole teaching process is smooth and there are always surprises, the teaching effect is great and beyond expectation.

REFERENCES

Lin Z.Q. (2018). Discussion on the teaching of university physics research-based learning under the multimedia network environment [J]. *Computer products and circulation*, 7:226 + 235.

Luo X.Q., He F., Li Y.F. (2018). Research on undergraduate research-based learning based on innovation ability cultivation [J]. *Journal of higher education*, 13:33-35.

Zhang J.L. Research on undergraduate research-based learning [D]. *Huazhong University of Science and Technology in Wuhan*, 2002.

Zhang J.L. (2006). Research-based learning and its practice in research universities [D]. *Huazhong University of Science and Technology in Wuhan*.

Zhao Y.P. (2017). Analysis on the status quo and Countermeasures of inquiry learning for ordinary full-time undergraduates in Yan'an University [D]. *Yan'an University*.

Mathematical Problem-solving Strategies Related to Self-regulated Learning

Kayoko HASHIMOTO
1719519@ed.tus.ac.jp
Master student
Department of Mathematics and Science Education, Graduate school of Science,
Tokyo University of Science
Tokyo, Japan

Yuki WATANABE
wat@rs.tus.ac.jp
Associate Professor
Department of Mathematics and Science Education, Graduate school of Science,
Tokyo University of Science
Tokyo, Japan

We have two purpose of this study. The first one is to investigate the relationships between mathematics self-efficacy, mathematical problem-solving strategies and self-regulated learning strategies. The second one is to reveal mathematical problem solving strategies subscales related to self-regulated learning strategies. Participants of this study were 32 junior high school students. They completed a questionnaire composed of items of mathematics self-efficacy, mathematical problem-solving strategies and self-regulated learning strategies.
The Pearson correlation analysis showed there is a positive relationship between mathematics self-efficacy and self-regulated learning strategies ($r=.372$,$p<.05$) and between mathematical problem-solving strategies and self-regulated learning strategies ($r=.486$, $p<.01$). In addition, mathematical problem-solving strategy and mathematics self-efficacy are significant predictors of self-regulated learning strategy (28%) by the results of a multiple regression analysis predicting self-regulated learning strategy. Furthermore, on the basis of the results of factor analysis, we identified four mathematical problem solving strategies subscales: “thinking concretely”, “monitoring”, “understanding process” and “overcoming weakness”. We also investigated the relationship between these subscales and self-regulated learning strategies. Monitoring ($r =.412$, $p<.05$) and overcoming weakness ($r= .387$, $p<.05$) were shown a positive correlation between Self-regulated learning strategies by the results of the Pearson correlation analysis. This indicated that the behaviors after problem solving could be related to self-regulated learning strategies. These findings suggest that future intervention studies focus on acquiring these behaviors to enhance self-regulation of mathematics.

Key words: Self-regulated Learning, Mathematical Problem-solving, Self-efficacy

INTRODUCTION

The Central Council for Education of Ministry of Education, Culture, Sports, Science and Technology: MEXT(2016) required lesson improvement in terms of independent, interactive and profound learning. This leads students to understand learning contents deeply, to acquire qualities and ability and to continue to learn actively for the rest of their life. The independent learning refers that students have interest in learning and reflect their learning to make use of next time. This kind of learning has been studied as self-regulated learning.

Self-regulated Learning

Self-regulation refers to self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals. Self-regulatory processes are always explained as feedback loops involving a cycle of three phases(see Fig.1): forethought, performance and self-reflection (Zimmerman 2000). Forethought occurs before efforts to learn and includes learning processes and motivational beliefs that influence a person's willingness and preparation to learn or perform. Performance occurs during efforts to learn and includes learning and motivational processes that influence one's concentration and action. Self-reflection occurs after the performance phase and involves personal reactions to performance phase outcomes(Zimmerman *et al.* 2017).

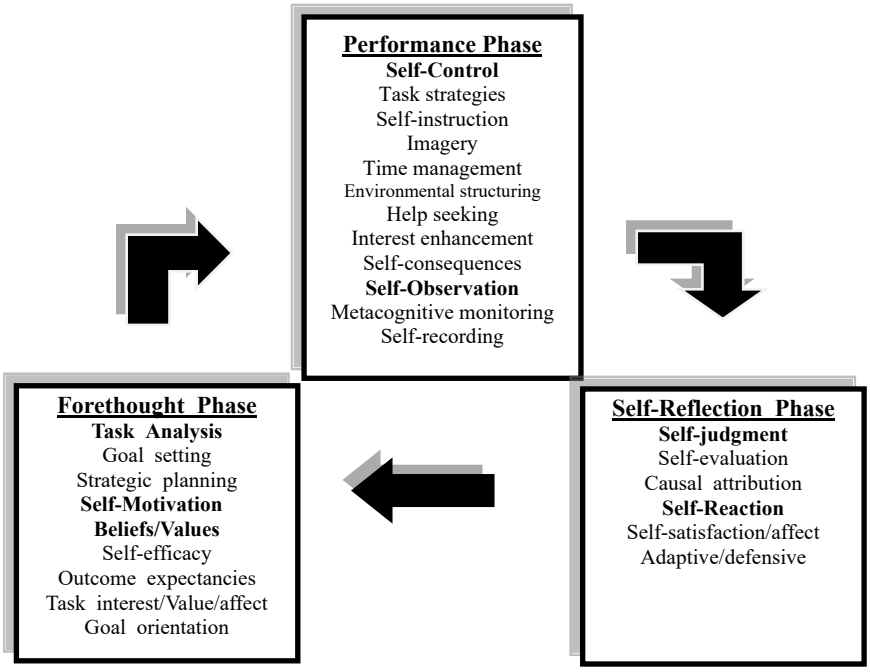


Fig. 1 Relation of self-efficacy beliefs to self-regulatory beliefs and processes (Zimmerman et al. 2017)

Self-regulatory skills described as one of five categories of cognitive, affective and conative components to acquire mathematical disposition. They contain skills related to the self-regulation of one's cognitive processes and to regulation of one's motivational and emotional processes(Corte et al. 2011).

Mathematical Problem-solving

Schoenfeld(1985) suggested the major stages of the problem-solving process; analysis, design, explanation, implementation, and verification. Learners begin with analysis when the problem is given. Analysis involves understanding the statement and simplifying the problem. Design involves structuring the argument. Exploration involves considering essentially equivalent problems, slightly modified problems, and broadly modified problems. Implementation involves step-by-step execution and local verification. Verification involves specific tests and general tests.

In mathematical learning, problem-solving process can be thought to correspond to Zimmerman's self-regulatory process: Building a representation of the task and planning a solution process correspond to Zimmerman's forethought. Monitoring during task execution converges with a major process of the performance phase. Evaluating outcome and reflecting on a solution correspond to Zimmerman's reflection (Corte et al. 2011).

Also, MEXT(2017) stated that mathematical problem-solving was important learning process for quality and abilities to cultivate in junior high school. It was, for example, understanding problem, planning to solve, considering results and reflecting on solving process and results. So, mathematical problem-solving can be thought to correspond to Zimmerman's self-regulatory process and important learning process.

Mathematics Self-efficacy

Self-efficacy is concerned with people's beliefs in their capabilities to produce given attainments (Bandura 1997). Academic self-efficacy influences cognitive strategy use and self-regulation through use of metacognitive strategies, and it is correlated with in-class seatwork and homework, exams and quizzes, and essays and reports(Pajares and Schunck 2001). Furthermore Pintrich and De Groot (1990) indicated that self-efficacy plays a facilitative role in the process of cognitive engagement and that raising self-efficacy beliefs might lead to increased use of cognitive strategies.

Mathematics self-efficacy was defined as a situational or problem-specific assessment of an individual's confidence in her or his ability to successfully perform or accomplish a particular task or problem (Hackett and Betz 1989). Matsunuma(2004) found that there was a positive relationship between mathematics self-efficacy and self-regulated learning strategies.

We have two purposes for this study. The first one is to investigate the relationship between mathematical self-efficacy, mathematical problem-solving strategies, and self-regulated learning strategies .The second one is to reveal mathematical problem-solving strategies subscales related to self-regulated learning strategies.

RESEARCH DESIGN & METHODS

Participants

The participants in this study were 32 junior high school students. They completed a questionnaire composed of items on mathematical self-efficacy, mathematical problem-solving strategies and self-regulated learning strategies.

Instruments

Self-regulated Learning Questionnaire

We used a Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich and De Groot 1990) to measure self-regulated learning strategies. We used 18 cognitive strategy use and self-regulation items that were translated into Japanese by Ito (1996). The respondents were instructed to respond to the items on a 5-point Likert scale(1=not true of me to 5=true of me).

Mathematical Problem-solving Questionnaire

We administered a mathematical problem-solving questionnaire composed of 20 items. Six of these items were strategies for checking failures in problem-solving (e.g., "I think what problem means concretely") (Seo 2005). One item is a strategy for memorizing and repetition (e.g., "I study weakness repeatedly."). Five items were strategies for understanding meaning (e.g., I make myself understand the process of deriving formula."), Two items were about metacognition (e.g., "When I study mathematics, I start planning at first.") (Ichihara and Arai 2006). The others were self-provided. The respondents were instructed to respond to the items on a 5-point Likert scale (1=not true of me to 5=true of me).

Mathematical Efficacy Questionnaire

The mathematical efficacy questionnaire was composed of 10 items. Six items were about mathematics self-efficacy (e.g., "I think I good at mathematics") (Matsunuma 2006). The rest were self-provided. The respondents were instructed to respond to the items on a 5-point Likert scale(1=not true of me to 5=true of me).

RESULTS

Table 1 contains the means and standard deviations for self-regulated learning, mathematical problem-solving and mathematics self-efficacy strategies. It shows that mean of the mathematical problem-solving strategies is higher than that of the self-regulated learning strategy ($t(31)=3.2$, $p=.0027<.05$). In the same vein, the mean of the self-regulated learning strategies is higher than that of mathematics self-efficacy ($t(31)=2.7$,$p=.011<.05$).

Table 1: Mean and Standard Deviations

	Mean	SD
Self-regulated Learning	3.17	0.51
Mathematical Problem-solving	3.66	0.46
Mathematics Self-efficacy	2.75	0.92

Table 2 shows the results of the Pearson correlation analysis of the self-regulated learning strategy, mathematical problem-solving strategy, and mathematics self-efficacy strategy. The analysis showed that there are positive relationships between mathematics self-efficacy and self-regulated learning strategies (r=.372,p<.05) and between mathematical problem-solving strategies and self-regulated learning strategies(r=.486, p<.01). But the correlation between mathematical problem solving strategy and mathematics self-efficacy is not significant.

Table 2: Results of Pearson Correlation Analysis of the Self-Regulated Learning Strategy, Mathematical Problem-solving Strategy and Mathematics Self-efficacy

	SRL	MPS	MSE
Self-regulated Learning	1.000		
Mathematical Problem-solving	.486**	1.000	
Mathematics Self-efficacy	.372*	.329	1.000

* p<.05 ,** p<.01

Table 3 contains the results of a multiple regression analysis predicting self-regulated learning strategy. In the first step, the independent variable, mathematical problem-solving strategy, provided a statistically significant explanation of variance in the self-regulated learning strategy (R=.486, R^2=.236, F=9.28, p=.004). In the second step, the independent variables, mathematical problem-solving and mathematics self-efficacy strategies, provided a statistically significant explanation of variance in self-regulated learning strategy (R=.535, R^2=.287, F=5.83, p=.007). Mathematics self-efficacy strategy made a 5% contribution to the model, so two variables explained 29% of the total variance in self-regulated learning strategy.

Table 3: Results of the Regression Analysis Predicting Self-regulated Learning

Variable	B	SE B	β	t	p
First step					
Mathematical Problem-solving	.542	.178	.486	3.047	.004
Second step					
Mathematical Problem-solving	.455	.185	.408	2.456	.020
Mathematics Self-efficacy	.133	.093	.238	1.432	.162

First step: R=.486, R^2=.236, F=9.28, p=.004
Second step: R=.535, R^2=.287, F=5.83, p=.007

Furthermore, on the basis of the results of the factor analysis, we identified four mathematical problem-solving strategies subscales: “thinking concretely”, “monitoring”, “understanding process” and “overcoming weakness”. Here, the “thinking concretely” scale consists of 6 items (e.g., “I think what problem means concretely”); the “monitoring” scale consists of 6 items (e.g., “I think another way of solving the mathematical problem after finishing solving it.”); the “understanding process” scale consists of 5 items(e.g., “I think how formula is turned, but I memorize it.”); and the “overcoming weakness” scales consists of 3 items (e.g., “I solve the mathematical problem again to understand mistakes.”).

Table 4: Results of Pearson Correlation Analysis of the Self-regulated Learning Strategies and Mathematics Self-efficacy Subscales

	Thinking concretely	Monitoring	Understanding process	Overcoming weakness
Thinking concretely	1.000			
Monitoring	.234	1.000		
Understanding process	.280	.337	1.000	
Overcoming weakness	.235	.295	.181	1.000
Self-regulated Learning	.347	.412*	.174	.387*
Mathematics Self-efficacy	.180	.470**	.061	.158

* $p<.05$,** $p<.01$

We also investigated the relationship between these subscales and self-regulated learning strategies and mathematics self-efficacy strategy(Table 4). Monitoring ($r = .412$, $p<.05$) and overcoming weakness ($r = .387$, $p<.05$) showed there is a positive correlation with self-regulated learning strategies. Also, monitoring only had a positive correlation with mathematics self-efficacy strategy($r = .470$, $p<.01$). However, no correlation was found among the other variables.

DISCUSSION

First, mathematics self-efficacy had the lowest mean of the three independent variables. This corresponds with the results of the TIMSS2015. MEXT (2015) found that 52% of the junior high school students in Japan answered positively to the question that mathematics is fun, while 71% of global average. This implies that the participants in this study do not have mathematics self-efficacy.

Second, the results of the Pearson correlation analysis showed that there is a positive correlation between mathematical problem-solving and self-regulated learning strategies. The correlation between self-regulated learning strategy and mathematics self-efficacy corresponds to that of a previous study (Matsunuma 2004). We also found a relationship between mathematical problem solving and self-regulated learning strategy. This implies that students who use self-regulated learning strategies tend to use much mathematical problem-solving strategies. In addition, mathematical problem-solving strategy is a significant predictor of self-regulated learning strategy (23%), and mathematical problem-solving strategy and mathematics self-efficacy account for 28% of self-regulated strategy. So, we concluded that promoting mathematics self-efficacy and mathematical problem-solving strategies can enhance self-regulated learning strategies.

Finally, the results of the Pearson correlation analysis showed that there is a positive correlation between monitoring and self-regulated learning strategies and between overcoming weakness and self-regulated learning strategies. The “monitoring” scale consists of 6 items(e.g., “I think another way of solving the mathematical problem after finishing solving it.”, “When I see the problem, I check the formula that can use.). So, the behaviors to check the way of solving problem are thought to relate self-regulated learning strategies. The “overcoming weakness” scale consists of 3 items (e.g., “I solve the

mathematical problem again to understand mistakes.", "I solve the problem again and again to overcome weakness."). So, the behaviors to overcome mistakes and weakness are thought to relate self-regulated learning strategies. The common point between monitoring and overcoming weakness is the behavior after problem solving. Therefore, we considered self-regulated learning strategies related to the behavior to think another solving way and to reflect solving process. Furthermore, we also found that mathematics self-efficacy related to monitoring. It implicated that students have high mathematics self-efficacy tend to monitor their mathematical problem-solving process. These findings suggest that future intervention studies focus on acquiring these behaviors to enhance self-regulation of mathematics.

CONCLUSION

In this study, we investigated the relationships between mathematical self-efficacy, mathematical problem-solving strategies and self-regulated learning strategies. Mathematical problem-solving strategy and mathematics self-efficacy related to self-regulated learning strategies. We also found that mathematical problem-solving strategy and mathematics self-efficacy account for 28% of self-regulated strategy. Therefore promoting mathematics self-efficacy and mathematical problem-solving strategy could enhance self-regulated learning strategies. And then we revealed mathematical problem-solving strategies subscales related to self-regulated learning strategies. The results suggest suthat the behaviors after problem-solving could be related to self-regulated learning strategies.

REFERENCES

Bandura, A.(1997). *Self-efficacy: The exercise of control*. New York.: W. H. Freeman and Company.

De Corte, E. and Mason, L. (2011). Self-Regulation of Mathematical Knowledge and Skills. *Handbook of Self-Regulation of Learning and Performance.* Routledge. 10:155-172

Hackett, G., and N.E. Betz. (1989). An exploration of the mathematics self-efficacy/mathematics performance correspondence. *Journal for Research in Mathematics Education20*.3: 261-273.

Ichihara, M., & Arai,K.(2006).Moderator Effects of Meta-cognition: A Test in Math of a Motivational Model. *Japanese Journal Educational Psychology*. 54:199-210

Ito, T.(1996). Self-efficacy, Causal Attribution and Learning Strategy in an Academic Achievement Situation. J*apanese Journal Educational Psychology*,44:340-349(in Japanese)

Pintrich, P.,R. ,& De Groot, E.,V.(1990).Motivational and Self-Regulated Learning Components of Classroom Academic Performance. *Journal of Educational Psychology*. 82. 33-40.

Ministry of Education, Culture, Sports, Science and Technology(2015). https://www.mext.go.jp /component/a_menu/education/micro_detail/__icsFiles/afieldfile/2016/12/27/1379931_1_1.pdf

Ministry of Education, Culture, Sports, Science and Technology(2016). https://www.mext. go.jp/b_menu/shingi/chukyo/chukyo0/toushin/__icsFiles/afieldfile/2017/01/10/1380902_0.pdf

Ministry of Education, Culture, Sports, Science and Technology(2017). https://www.mext.go.jp/ component/b_menu/shingi/toushin/__icsFiles/afieldfile/2017/01/10/1380902_3_2.pdf

Matsunuma, M.(2004). Test Anxiety, Self-Efficacy, Self-Regulated Learning, and Test Performance:4th Grade Students and an Arithmetic Test. *Japanese Journal Educational Psychology*. 52:426-436.(in Japanese)

Pajares, F., & Schunk,D.,H.(2001). Self-Beliefs and School Success: Self-efficacy, Self-concept ,and School Achievement. *International perspectives on individual differences, Vol 2: Self perception*. London :Ablex Publishing.

Seo,M.,(2005).Academic Help-Seeking and Question-Generating in mathematics:Role of Strategies to Check Failures in Problem Solving. *Japanese Journal Educational Psychology*,53:441-s455.(in Japanese)

Schoenfeld, A.,H.(1985). *Mathematical Problem Solving,* New York. :Academic Press.

Zimmerman, B., J. (2000). Attaining self-regulation A social cognitive perspective. *Handbook of Self-Regulation*, Academic Press.:13-29

Zimmerman, B., J., Schunk, D., H.,& Dibenedetto, M., K.(2017). The Role of Self-Efficacy and Related Beliefs in Self-Regulation of Learning and Performance.Handbook of Competence and Motivation: Theory and Application. The Guilford Press .17:313-333

An Empirical Study on Collaborative Online International Learning

Yayoi Anzai
yayoi.wikiwiki@gmail.com
Researcher
International Christian University
Tokyo, Japan

Abstract: This year, COVID-19 has caused changes in society, and a sudden surge of online learning is one of the significant phenomena. University students needed to study online to keep a social distance. ZOOM has become one of the most popular platforms which many universities have employed to make education to continue. This study investigates the effects of collaborative online international learning with ZOOM on learners' perception of Openness and usability of chat in English for Japanese university students. The study was conducted in October 2019 in a laboratory setting. The number of Japanese participants was 59. Among these 60, 30 students used computers, and the other 30 students used smartphones. A Malaysian university student interacted with them online. First, an online survey was conducted to find the learner characteristic and perceptions of Openness before the implementation. Then, The Malaysian student introduced Malaysian culture, and his culture shock when he arrived in Japan. Following his online talk, the Japanese students asked questions in English using handout listed sample questions. Then, they freely chatted with the Malaysian student either in Japanese or English. Finally, an online survey was conducted to find out the perception of Openness after the implementation. The study found statistical differences in many items of perceptions of Openness before and after the implementation, and the device they used. The study also found that online English chat can be included in instructional design in online collaborative international learning. The participants were willing to express their opinions synchronously in public, though there are many grammatical mistakes.

Key words: Collaborative Online International Learning, Openness, Distance Education, Academic English

INTRODUCTION

Change is the only constant in life. It holds true in education, too, but this year 2020, there was a quantum leap in online education. COVID-19 has given a massive impact on society, and teachers were suddenly forced to change the modes of education from face to face to online education without much time for preparation (Downes, 2020). Students were also forced to accept online education without much choice. The goal of education in the first semester was not to stop education. Under this circumstance, universities requested teachers to deliver education online by one of the three methods: Real-time, On-demand, or Self-education Real-time is the type of class where teachers and students will hold a live 90 minutes' class online from different locations. Teachers and students access an online class prepared by the teacher using a Web conferencing system such as ZOOM or Webex. On-demand is the type of class where students watch a recorded video of the class prepared by the teacher, usually within one week. They interact with each other using such a tool as a Learning Management System (LMS). On-demand includes Powerpoint slides that have a voice-over by the teacher. Self-education is like traditional distance learning. The teacher provides documents and assignments for real-time online education, On-demand online learning, and self-paced online learning (Aoyama Gakuin University, 2020). This empirical study was conducted in a laboratory setting to find out the effects of synchronous online learning on university students. It is hoped that this study is useful for teachers and researchers under the

COVID-19 who are still expected to continue online education in the second semester of 2020 academic year.

Collaborative Online International Learning (COIL) is an innovative way of online distance education. It aims to promote intercultural competency, global awareness, and cross-lingual communication to prepare students for a multicultural professional environment (Tokyo University of Foreign Studies, 2020). There are various terminologies for this type of online international distance education, and there is much in common. What is unique about the COIL is that the Ministry of Education, Culture, Sports, Science and Technology (MEXT) has been supporting the COIL projects since 2018 to promote Educational Reform in public and private universities. These projects aim to enhance quality-assured collaboration and student exchange with universities in countries and regions which are essential for Japan (ICU, 2020). These projects are significant for Japanese globalization. So, to deepen understanding about COIL, this study was conducted to investigate how a COIL type of learning influences university students. This is a series of empirical studies that explore the potentiality of COIL and aims to propose teaching strategies (Anzai, 2019; 2020; Anzai, Abas & Kasuga, 2019.)

In this study, the students' perception was investigated in terms of Openness. COIL can be said it is a kind of Open learning, which aims to realize ideology that "anyone can now learn anything from anyone at any time" (Bonk, 2005). The study also considered students' devices to study the effect of this instructional design. Furthermore, this study investigated the potentiality of English chat as a synchronous communication tool. The followings are the questions for this study.

Question 1: How does the COIL type of EFL instruction influence university students' perception of Openness?

Question 2: How does the device used for the COIL influence on their perception of Openness?

Question 3: Can Japanese university students participate in English chat spontaneously?

METHODS

The study was conducted in October 2019 in a laboratory setting in Tokyo. The number of Japanese participants was 59, and they were divided into two groups: a computer group and a smartphone group, and a Malaysian university student interacted with them online (see Fig. 1.) First, an online survey was conducted to find the learner characteristic and perceptions of Openness before the implementation. Then, the Malaysian student introduced Malaysian culture, and his culture shock when he arrived in Japan. Following his online talk, the Japanese students asked questions in English using handout listed sample questions. Then, they freely chatted with the Malaysian student either in Japanese or English. Finally, an online survey was conducted to find out the perception of Openness after the implementation. The Open Scale (Anzai, 2011) was used for this purpose.

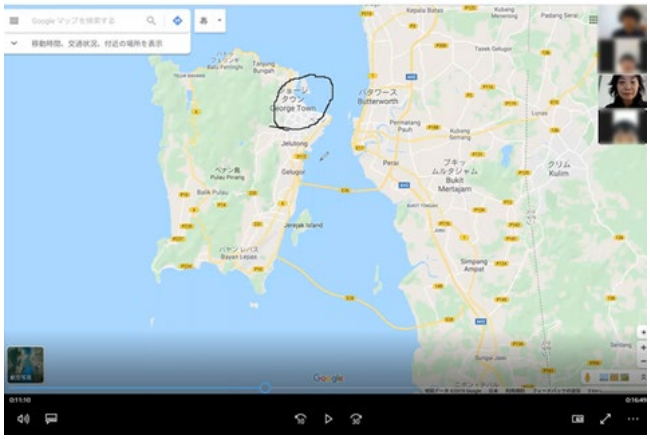


Fig.1. A screenshot from Online international exchange

RESUTS

Firstly, this section examined the changes in students' perception of Openness before and after the COIL type of EFL instruction. Secondly, it examined the effects of the device, a computer or a smartphone, on the perception of Openness. A 2 X 2 Analyses of variance (ANOVA) was conducted for this purpose. The independent variable was Survey (pre-survey and post-survey) and Device (computer and smartphones). The dependent variable was the total score of the items in perception of Openness. The effect size followed Cohen (1988) that the effect size is small if the value of *r* varies around 0.20, medium if *r* varies around 0.50, and large if *r* varies more than 0.80. There was no interaction between Device and Survey. There was, however, a significant main effect of Survey on perception of Openness with small effect size, F (1, 47) = 8.48, p = < .01, $\eta 2$ = .15. The participants perceived more Openness in the post-survey (M = 107.31, SD = 18.48) that that in the pre-survey (M = 100.59, SD = 16.81). There was a marginal significant main effect of Device on the perception of Openness with small effect size, F (1, 47) = 3.43, p < .10. The smartphone group perceived more Openness than that of the computer group.

Furthermore, Table 1 is a summary of 2-way analyses of variance (ANOVA) to determine whether two independent variables, Survey (pre-survey and post-survey) and Device (computer and smartphone) had effects on perception of each item of Openness and if there was a significant interaction.

Table 1. *Effects of COIL type of instruction on EFL learners' perception*

		Survey	Device	Interaction
1.	We have a wide variety of choices in learning methods.	$p < .1$	$p < .05$	$p < .10$
2.	We have various choices in communication.	$p < .01$	$p < .05$	$p < .05$
3.	We have various choices in selecting learning content.	$p < .05$	$p < .1$	*n.s.*
4.	It is accepted that a learner's progress varies depending on the individual learner.	*n.s.*	*n.s.*	*n.s.*
5.	We have a wide variety of methods in learning support services.	$p < .05$	$p < .05$	$p < .05$
6.	We have a wide variety of content in study support services.	*n.s.*	$p < .10$	$p < .10$
7.	We can participate in learning.	$p < .05$	*n.s.*	*n.s.*
8.	We can interact with a teacher.	*n.s.*	*n.s.*	*n.s.*
9.	It is accepted that our learning ability varies depending on the teacher.	*n.s.*	*n.s.*	*n.s.*
10.	We can collaborate with other learners.	$p < .10$	*n.s.*	$p < .10$
11.	We have various curricula.	*n.s.*	$p < .05$	*n.s.*
12.	Education is open to access.	*n.s.*	*n.s.*	$p < .05$
13.	We can learn depending on our needs.	$p < .05$	*n.s.*	*n.s.*
14.	We have a wide variety of choices in the media.	$p < .10$	$p < .10$	*n.s.*
15.	We can learn at any time.	*n.s.*	*n.s.*	*n.s.*
16.	We can learn anything.	*n.s.*	*n.s.*	*n.s.*
17.	Anyone can learn regardless of his/her social class.	*n.s.*	*n.s.*	*n.s.*
18.	We can learn in any place.	$p < .10$	$p < .10$	$p < .10$
19.	Economic barriers are lowered.	$p < .05$	$p < .05$	*n.s.*
20.	We can learn without excluding certain social classes.	*n.s.*	*n.s.*	$p < .10$
21.	Learning is often free of charge.	$p < .05$	$p < .05$	$p < .05$
22.	We can learn from anyone.	*n.s.*	*P <.01.*	*n.s.*
23.	Now we can learn, even if we are not formal students.	*n.s.*	*n.s.*	*n.s.*
24.	We can overcome physical distance.	$p < .05$	*n.s.*	*n.s.*
25.	We can overcome time barriers.	*n.s.*	*n.s.*	*n.s.*
26.	We can remove a spatial constraint.	*n.s.*	*n.s.*	*n.s.*
27.	We can interact with learning content.	*n.s.*	*n.s.*	*n.s.*
28.	We can remove time constraints.	$p < .05$	*n.s.*	*n.s.*
29.	We can interact with other learners.	$p < .05$	*n.s.*	*n.s.*

In sum, there were significant or marginal interactions in the following items: 1) We have a wide variety of choices in learning methods, 2) We have various choices in communication, 5) We have a wide variety of methods in learning support services, 6) We have a wide variety of content in study support services, 10) We can collaborate with other learners, 12) Education is open to access, 18) We can learn in any place, 20) We can learn without excluding certain social classes, 21) Learning is often free of charge.

Concerning the research questions 1, the statistical analyses clearly indicated that the COIL type of EFL instruction enhances students' perception of Openness. Regarding the research question 2 about device they use, smartphones are more likely to open the perception of Openness than computers. As for the research question 3, it is found that Japanese university students can actively participate in English chat.

(2) The potentiality of using English chat in COIL

The study found that Japanese university students can participate in English chat spontaneously, thus online English chat can be a handy communication tool in online learning. The Malaysian student talked about his experience of a culture shock when he came to Japan how he was amazed at Japanese chaotic behavior on the train platform during the rush hour. The Japanese university students were willing to respond to his opinion, and they expressed their opinions synchronously in an open space, in spite that the duration was limited to three minutes and 30 seconds. Fifteen Japanese students out of thirty wrote chats. Surprisingly, more students used English than those who used Japanese. Nine students chatted in English, while six did in Japanese. Theme analysis was conducted on the content of the chat, and it was found that they mostly talked about comparisons of transportation systems between Japan and Malaysia. The Japanese students showed a keen interest in intercultural communication.

DISCUSSION AND CONCLUSION

This study found that after the students experience the COIL type of instruction, they are likely to perceive more Openness than before. In addition, smartphones may be used for COIL effectively. Smartphones is a tool that most Japanese university students carry most of the time, and by integrating the mobile device, learning can become more flexible.

In addition, chat can be a helpful tool to connect the participants in COIL. According to the Constructivist approach, the social context of learning is crucial (Vygotsky, 19978). Learners can construct new knowledge rather than simply acquire it by memorization or through transmission from a teacher. Social constructivist believe that this process works best through discussion and social interaction (Bate, 2019). Online chat would be an excellent place to facilitate discussion among learners, as is seen in this study. Students would enjoy intercultural communication without worrying too much about making grammatical

mistakes. Purarjomandlangrudi & Chen (2020) mentioned that students' interaction and engagement is essential for student successful learning outcomes and satisfaction. In this regard, English chat could promote students' learning and can be included as a part of COIL activities.

COIL is a new attempt for many teachers and students. This is assumed to be an effective way to promote globalization in Japan and beyond. Further empirical studies are definitively needed to enable COIL type of instructional design to spread and reach the hands of every teacher who wants to try, not only teachers at elite universities.

REFERENCES

Anzai, Y. (2011). Effects of Open Instructional Design on Perception of Openness, Proficiency in English as a Foreign Language and the Learning Process: Development of Open Instructional Design (Unpublished doctoral dissertation). International Christian University, Tokyo.

Anzai, Y. (2019). Collaborative Online International Learning for English Education: Using a Web Conferencing System, ZOOM, and BYOD, 5, 78, Annual Report, Center for Research on Educational Testing.

Anzai, Y. (2020). Basic Research on Collaborative Online International Learning with ZOOM, 5, 37 – 40.

Anzai, Y., Abas, Z. W., & Kasuga, M. (2019). Instructional Design for Collaborative Online International Learning using ZOOM and Smart-phones, International Conference for Media in Education 2019, 75 – 82.

Aoyama Gakuin University (2020). Online education in the first semester. Retrieved from https://www.aoyama.ac.jp/president_room/online-lecture

Bate, T. (2019). *Teaching in a* digital age – second edition. Retrieved from https://opentextbc.ca/teachinginadigitalage/

Bonk, C. J. (2009). *The world is open*. Jossey-Bass, San Francisco: USA

Downes, S., (2020). The Future of Online Learning. Retrieved from https://www.youtube.com/watch?v=LmNacW6PV_Q

Purarjomandlangrudi, A., Chen, D. (2020). Exploring the influence of learners' personal traits and perceived course characteristics on online interaction and engagement. *Education Tech Research Dev* (2020). https://doi.org/10.1007/s11423-020-09792-3

Tokyo University of Foreign Studies (2020). Trans-Pacific Collaborative Online International Learning for Multiculturalism and Conflict-Resilience. Retrieved from http://www.tufs.ac.jp/tp-coil/en/

Vygotsky, L. (1978). *Mind in society: development of higher psychological processes.* Cambridge MA: Harvard University Press

The Use of Tweet-Format Narrative Reflections During a Service-Learning Trip to Appalachia

Allison C. Munn, PhD, RN
amun@fmarion.edu
Assistant Professor
Francis Marion University
Florence, SC, USA

Tracy P. George, DNP, APRN-BC, CNE
tgeorge@fmarion.edu
Assistant Professor
Francis Marion University
Florence, SC, USA

Tiffany A. Phillips, DNP, NP-C
tphillips@fmarion.edu
Assistant Professor
Francis Marion University
Florence, SC, USA

J. Marty Hucks, MN, APRN-BC, CNE
jhucks@fmarion.edu
Assistant Professor
Francis Marion University
Florence, SC, USA

Tweet-format narratives have been used in medical education to capture student experiences. However, there is a lack of research on tweet-format narratives during experiential learning in nursing education.
Purpose: The purpose of this project was to explore the usefulness of tweet-format narratives to capture nursing student experiences and to elicit reflection during a service-learning trip.
Methods: Eight bachelor of science in nursing (BSN) students participated in a service-learning experience to Appalachia. A grounded theory approach with three data collection methods was used to determine the usefulness of tweet-format narratives to facilitate student reflection during the event. A free closed text-messaging app was used to house tweet-format narratives. A focus group session and post-survey were conducted at the conclusion of the trip. Emergent themes from each data collection method were compared and modified using iterative techniques and constant comparison analysis until the data were saturated.
Results: Focus group responses were reflective in nature and included student elaboration about content themes that were previously identified by the tweet-based narratives. Modification of themes resulted in six final themes of improved skills, cultural competence, patient interaction, socioeconomic factors and health, landscape/clinic setting, and impactful shared experiences.
Conclusions: It is important for nursing students to reflect on their experiences during service-learning immersion trips, especially as they relate to underserved rural populations and their unique healthcare scenarios. With the growth of social media, more nursing students are accustomed to communicating in a short, text-based format. The tweet-format narratives in the free closed text-messaging app allowed students to reflect on their

experiences through open-ended comments and to communicate with other members of the group. Short text-based narratives can be an effective narrative medicine technique for nursing students participating in service-learning trips in rural areas.

***Key words**:* narrative medicine, rural health, service-learning, technology

INTRODUCTION

Narrative medicine is an approach to care that incorporates patient/provider narratives into clinical practice and includes "recognizing, absorbing, interpreting, and being moved by the stories of illness" (Charon, 2006, p. 4). The use of technology in medicine may feel impersonal to patients (Liao & Wang, 2020). Patients desire healthcare providers who listen to them, are attentive to their needs, and address their concerns, and these attributes are encouraged through the use of narrative medicine (Zaharias, 2018). Through narrative medicine, providers become aware of patients' lived experience of illness, which may foster holistic care and improved health outcomes (Remein et al., 2020). Likewise, Cenci (2006) found that narrative medicine, through reflection on patient's stories, promoted an interdisciplinary, patient-centered approach to delivery of care. Narrative medicine is consistent with a personalized approach to healthcare that considers each patient's individuality (Fioretti et al., 2016).

Narrative medicine serves to elicit reflection, and reflection is an important component of medical/healthcare education, wherein students can reconcile their performance during patient interactions, encounters, and experiences (Charon, 2006; Dressler et al., 2019). Reflection provides the opportunity for students to take a break from what is occurring, allows them to the review an experience, and helps them reassess the situation and problem-solve (Murphy, Franz, & Schlaerth, 2018). Furthermore, student reflection facilitates improvement in areas such as professionalism, responsiveness, critical analysis, and decision-making (Charon, 2006; Dressler et al., 2019).

The benefits of narrative medicine include improved communication and collaboration skills, empathy, personal growth, patient-centeredness, and job satisfaction (Arntfield et al., 2013; Small, Feldman, & Oldfield, 2017; Reiman et al., 2020). Empathy can be sustained after involvement in narrative medicine. Chen, Huang, and Yeh (2017) found that empathy scores were sustained for 1.5 years after participating in a narrative medicine program. According to Reiman et al. (2020), narrative medicine assisted in the detection and reduction of burnout, promoted critical thinking about ethical issues, and improved clinical skills. Similarly, Tsai and Ho (2012) found that medical students with experience in

narrative medicine performed better on objective structured clinical examination (OSCE) communication stations.

Short tweet-format reflections have been used in medical education and residency programs to capture student experiences, and the use of tweet-format narratives may be an effective tool to facilitate reflection in narrative medicine (Dressler et al., 2019; Liao & Secemsky, 2015; Wesley, Hamer, & Karam, 2018). Dressler and colleagues (2018) explored the use of tweet-format narratives to document student experiences and found that the tweets elicited reflection and provided richer information about student experiences than standard evaluation tools. The use of narrative medicine among interprofessional teams has been associated with decreased isolation among health care providers, and it allowed the members to share a variety of perspectives (Small et al., 2017).

While reflective practice in medical school education has been utilized with success, there is a lack of data on the usefulness of narrative medicine or tweet-format journaling among nursing students (Dressler et al., 2019; Tsai & Ho, 2012). Mangino (2014) discussed the importance of reflective nursing practice and asserted the importance of incorporating narrative medicine into nursing curricula. The purpose of this research project was to explore the usefulness of tweet-format narratives to capture nursing student experiences and to elicit reflection during a service-learning trip to Appalachia

RESEARCH DESIGN & METHODS

Study Design

A four-person nursing faculty team from a public, liberal arts university in the Southeastern United States secured internal grant monies to guide and accompany senior-level bachelor of science in nursing (BSN) students on a three-day service-learning immersion event in rural Appalachia. The nursing students assisted with a free three-day mobile clinic at a local fairground and were exposed to patients and local providers from this rural area of Appalachia. The faculty research team utilized a grounded theory approach and three separate data-collection methods to determine the usefulness of tweet-format narratives to capture student experiences and to facilitate reflection among nursing students who participated in the service-learning event (Charmaz, 2014, Dressler et al., 2019; Glasser & Strauss, 1999; Hesse-Biber & Leavy, 2011). The study was approved by the university Institutional Review Board (protocol number: 02-26-2019-004).

Recruitment and Participants

Students were recruited for the service-learning immersion event during classroom visits. The faculty team introduced the nature of the trip and described the opportunity for interested students to participate in a mobile clinic involving the delivery of healthcare services to underserved populations. Students were also introduced to the concept of narrative medicine and informed of the tweet-format reflective journaling study that would coincide with the service learning immersion event. Eight students volunteered to attend the trip and to participate in the immersion experience and in the tweet-narrative reflection study. The students provided their signed informed consent to participate in the study and were able to choose to withdraw or not participate in the study at any time. The study and immersion event were not tied to a nursing course, and there was no danger of academic penalty through participation or non-participation in the study. The cost of the trip for students was supported by the grant funding and was nominal.

Data Collection

Data collection methods included student and faculty tweet-length narratives that were journaled throughout the service-learning immersion event, and a post-survey and focus group session conducted at the conclusion of the trip.

Closed-Messaging App

Students and faculty used a secured and free-closed messaging app to communicate with each other about status, location, and experiences during the service learning trip. Faculty encouraged student activity within the closed-messaging app throughout the trip to provide avenues for documentation of experiences, communication, and reflection. Students were prompted by faculty to write tweet-length narrative journal entries during break periods of each day and a final thought or reflection each night. Faculty were also active participants in the closed text-messaging app to document experiences during the trip and to encourage student interaction and participation through initial tweet-narrative journal entries, responses to initial journal entries, and comments of support or shared experiences.

Post-Survey

A paper-based post-survey was administered on the final day of the service learning trip to capture student demographic data and to offer participants an opportunity to provide further detail of their experiences in an anonymous manner. The survey was administered before the focus group session so that individual student feedback would not be influenced by peer responses in the focus group forum. The

post-survey was constructed by the research team before the service-learning trip and included three broad, open-ended questions: 1) How has this service learning experience impacted you?, 2) What would you change about the experience?, and 3) Any additional comments?

Focus Group Session

When designing the study, the research team constructed a preliminary semi-structured interview guide based on the concepts of experiential learning, narrative medicine and journaling, and reflection (Mangino, 2014; Murphy et al., 2018; Remein et al., 2020). A focus group session was conducted using a modified version of the semi-structured interview guide at the conclusion of the trip and provided an opportunity for students to have open-ended discussion of learning encounters and to recall service-learning trip experiences.

The researchers read an informed consent statement at the start of the session and moderated the session using the modified semi-structured interview guide and guided probes. The session was audio recorded and transcribed verbatim with no participant identifiers collected. The session lasted approximately 22 minutes. All students actively participated and were engaged in the session, offering rich and detailed recounts and reflections of their shared experiences.

Data Analysis

The faculty research team collected and analyzed the data utilizing constant comparison and iterative techniques until the data were saturated. The research team included one faculty member with expertise in narrative medicine and service-learning experiences. This faculty member offered limited input in the data analysis process to prevent a priori assumptions and experiences from influencing the coding schema and category formation (Charmaz, 2014; Glasser & Strauss, 1999; Hesse-Biber & Leavy, 2011). The other three faculty researchers used bracketing techniques to limit preconceptions and unintended alterations of the data during the qualitative analysis.

The faculty research team extracted the tweet-narratives from the closed-messaging app each night of the trip and explored the data through organization, memo writing, and initial coding (Charmaz, 2014; Glasser & Strauss, 1999; Hesse-Biber & Leavy, 2011). The faculty team reviewed the tweet-narratives and conducted the initial memo writing and coding separately and then discussed as a group to determine agreement. Table 3 provides examples of the tweet-narratives, codes, categories, and emerging themes associated with the coding scheme.

In accordance with the tenants of grounded theory construction and constant comparison and iterative analysis techniques, the preliminary semi-structured interview guide was modified to incorporate emerging content and themes discovered through initial coding and analysis of the tweet-format narratives (Charmaz, 2014, Glaser & Strauss, 1999; Hesse-Biber & Leavy, 2011). The modified version of the interview guide included open-ended questions to elicit discussion about student experiences with the patients, local residents and culture, landscape, and with other peers and faculty. The modified interview guide was used to conduct the focus group session.

The research team reviewed open-ended survey responses and transcripts from the focus group session using the same iterative analysis and coding approach that was used for the tweet-format narratives. Themes from the tweet-format narratives were compared to those from the focus group session and survey responses to identify similarities or differences in recall or expression of the immersion event experiences. To determine reflection, student responses were examined for statements indicative of introspection, empathy, and critical thought about lessons learned (Chen et al., 2017; Murphy et al., 2018). Statements were examined to determine if students were able to convey understanding of patients' lives and situations after the immersive service-learning experience.

RESULTS

This experiential learning trip exposed students to many new cultural and patient care situations and elicited opportunity for student reflection through journaling. Students and faculty also uploaded photos of trip activities like packing bags of toiletries, electric toothbrushes, electric razors, and children's books to hand out to patients. Students learned about the culture and landscape of the region by visiting scenic mountain trails in the area, viewing a local play about the culture of the Appalachian residents, and visiting a venue to hear local musicians and to experience local dance.

Focus Group and Survey Responses

Focus group and survey responses allowed students an opportunity to elaborate and reflect upon a variety of trip experiences including peer, faculty, and patient interactions, cultural enrichment, attainment of skills, and lessons learned. Student elaboration of experiences allowed researchers to further understand student experiences and to refine and modify themes. The research team collaborated to

determine six modified themes of improved skills, cultural competence, patient interaction, socioeconomic factors and health, landscape/clinic setting, and impactful shared experiences.

DISCUSSION

This unique service-learning trip served as a valuable cultural enrichment and skills attainment experience for nursing students, and it provided an opportunity for the research faculty team to explore the usefulness of tweet-format narratives to elicit reflection in nursing students using a narrative medicine approach (Chen et al., 2017; Murphy et al., 2018). Students initiated experiential dialog and responded to each other during the trip with short tweet-format narratives that contained both thoughtfulness and reflection. The tweet-format narratives captured student experiences, elicited reflection, and enhanced students' experiences and interactions with one another and with faculty.

The focus group and surveys allowed for elaboration and refinement of six themes that emerged during the tweet-format narratives. Students explained the usefulness of tweet-narratives to facilitate shared experiences and reflection about those experiences. While group elaboration of content themes was important for further understanding of the shared experiences, all relevant content associated with the six themes was accounted for in the tweet-format narratives (Glasser & Strauss, 1999; Hesse-Biber & Leavy, 2011). Additionally, those narratives included both experiences and reflective thought that are important components of narrative medicine (Charon, 2006; Mangino, 2014).

It is important for nursing students to reflect on their experiences, both on service-learning immersion trips, and in other nursing school learning activities. With the growth of social media, more nursing students are accustomed to communicating in a short, text-based format. The tweet-format narratives in the free closed text-messaging app allowed students to reflect on their experiences through open-ended comments and to communicate with other members of the group. Short text-based narratives can be an effective narrative medicine technique to encourage reflection, to promote group discussions, and to enhance peer support while on service-learning trips to rural areas, and the rural setting can provide a backdrop that encourages self-reflection among students and faculty and honors the stories of patients, providers, and students.

REFERENCES

Arntfield, S. L., Slesar, K., Dickson, J., & Charon, R. (2013). Narrative medicine as a means of training medical students toward residence competencies. *Patient Education and Counseling, 91*, 280-286. https://doi.org/10.1016/j.pec.2013.01.014

Cenci, C. (2016). Narrative medicine and the personalisation of treatment for elderly patients. *European Journal of Internal Medicine, 32*, 22-25. https://doi.org/10.1016/j.ejim.2016.05.003

Charmaz, K. (2014) Constructing grounded theory (2nd ed.). Sage

Charon, R. (2006). *Narrative medicine: Honoring the stories of illness*. New York, NY: Oxford University Press.

Chen, P. J., Huang, C. D., & Yeh, S. J. (2017). Impact of a narrative medicine programme on healthcare providers' empathy scores over time. *BMC Medical Education, 17*(1), 108. DOI 10.1186/s12909-017-0952-x

Dressler, J. A., Ryder, B. A., Connolly, M., Blais, M. D., Miner, T. J., & Harrington, D. T. (2018). "Tweet"-Format writing is an effective tool for medical student reflection. *Journal of Surgical Education, 75*(5), 1206-1210. https://doi.org/10.1016/j.jsurg.2018.03.002

Dressler, J. A., Ryder, B. A., Monteiro, K., Cheschi, E., Connolly, M., Miner, T. J., & Harrington, D. T. (2019). "Tweet"-format reflective writing: A hidden needs assessment? *The American Journal of Surgery, 217*(2), 314-317. https://doi.org/10.1016/j.amjsurg.2018.09.018

Fioretti, C., Mazzocco, K., Riva, S., Oliveri, S., Masiero, M., & Pravettoni, G. (2016). Research studies on patients' illness experience using the Narrative Medicine approach: A systematic review. *BMJ Open, 6*(7). e011220. doi:10.1136/bmjopen-2016-011220

Glaser, B.G. & Strauss, A.L. (1999). *Discovery of grounded theory: Strategies for qualitative research*. Routledge

Hesse-Biber, S.N. & Leavy, P. (2011). *The practice of qualitative research*. (2nd ed.). California: Sage.

Liao, J. M., & Secemsky, B. J. (2015). The value of narrative medical writing in internal medicine residency. *Journal of General Internal Medicine, 30*(11), 1707-1710. https://doi.org/10.1007/s11606-015-3460-x

Liao, H. C., & Wang, Y. H. (2020). Storytelling in medical education: Narrative medicine as a resource for interdisciplinary collaboration. *International Journal of Environmental Research and Public Health, 17*(4), 1135. doi:10.3390/ijerph17041135

Mangino, H. (2014). Narrative medicine's role in graduate nursing curricula: Finding and sharing wisdom through story. *Creative Nursing, 20*(3),191-193. doi: 10.1891/1078-4535.20.3.191

Murphy, J. *W., Franz, B. A., & Schlaerth, C. (2018). The role of reflection in narrative Medicine. Journal of Medical Education and Curricular Development, 5*, 1-5. https://doi.org/10.1177/23821205187853

Remein, C. D., Childs, E., Pasco, J. C., Trinquart, L., Flynn, D. B., Wingerter, S. L., ... & Benjamin, E. J. (2020). Content and outcomes of narrative medicine programmes: A systematic review of the literature through 2019. *BMJ Open, 10*(1), e031568. doi:10.1136/bmjopen-2019-031568

Small, L. C., Feldman, L. S., & Oldfield, B. J. (2017). Using Narrative medicine to build community across the health professions and foster self-care. *Journal of Radiology Nursing, 36*(4), 224-227. https://doi.org/10.1016/j.jradnu.2017.10.002

Tsai, S. L., & Ho, M. J. (2012). Can narrative medicine training improve OSCE performance?. *Medical Education, 46*(11), 1112-1113. https://doi.org/10.1111/medu.12029

Wesley, T., Hamer, D., & Karam, G. (2018). Implementing a narrative medicine curriculum during the internship year: An internal medicine residency program experience. *The Permanente Journal, 22*, 17-187. doi: 10.7812/TPP/17-187

Zaharias, G. (2018). Narrative-based medicine and the general practice consultation: Narrative-based medicine 2. *Canadian Family Physician, 64*(4), 286-290. https://www.cfp.ca/content/64/4/286.abstract

Integrated assessment of citizen self-awareness and critical thinking in Japan and Costa Rica through Comic analysis

Aaron Mena
aaron.menaaraya@ucr.ac.cr
Associate Professor
University of Tsukuba Graduate School
San Jose, Costa Rica

One of the goals of elementary school education is providing children with the knowledge, skills, and attitudes they need to become active citizens, get involved in their communities, and seek solutions to social issues. Such citizenship can be effectively nurtured by integrating narrative learning in the development of a strong citizen identity. This paper describes the practice and assessment of two learning units in which Japanese and Costa Rican elementary school students used animation and comics, to create stories representing solutions to problems related to school and community life. These learning units included the viewing of short animated films, the use of thinking tools, and the creation of comics. An analysis of the comics yielded information on the students' level of self-awareness as citizens and critical thinking skills. Results suggest that although Japanese children generally obtained higher scores in both learning units, these units had a more significant effect on fostering citizen self-awareness and critical thinking skills among Costa Rican children.

Key words: Citizenship, critical thinking, ICT literacy, ATC21s skills, assessment

INTRODUCTION

Challenges in the assessment of ATC21S skills

Competency-based models offer guidance for developing learning processes that allow the simultaneous instruction and assessment of multiple competencies. These forms of instruction and assessment entail identifying suitable subjects and contents for learning of transversal skills and defining clear expected outcomes. They also require the introduction of customized educational media dealing with real-life situations familiar to the learners. The complexity of these tasks poses methodological and conceptual challenges to educators. Furthermore, it makes it difficult to design learning experiences that can be adapted and replicated in different geographical and cultural contexts.

One of the areas in which competency-based models can play a central role is the formation of active citizens, willing and able to solve local and global issues. Despite the ubiquity of citizen education in school systems worldwide, many students lack the knowledge, skills and motivation to participate in electoral processes, community building and other forms of political engagement. Even liberal democracies with deep cultural and economic differences, like Costa Rica and Japan, seem to share great difficulties in empowering their citizens (Japan Foundation, 2019; PNUD, 2013).

The ATC21S model describes general competencies as clusters of mutually supporting knowledge, skills, and attitudes (Griffin, McGaw & Care, 2012). The model includes "Citizenship, Local and Global" as one of its competencies. The nurturing of these forms of citizenship is directly supported by other competencies included in the model, such as "Critical Thinking, Problem-Solving, Decision-Making", and "ICT literacy". The pending issues of citizenship education can be effectively addressed through instruction and assessment activities involving the activation of specific skills related to these

complementary competencies (figure 1).

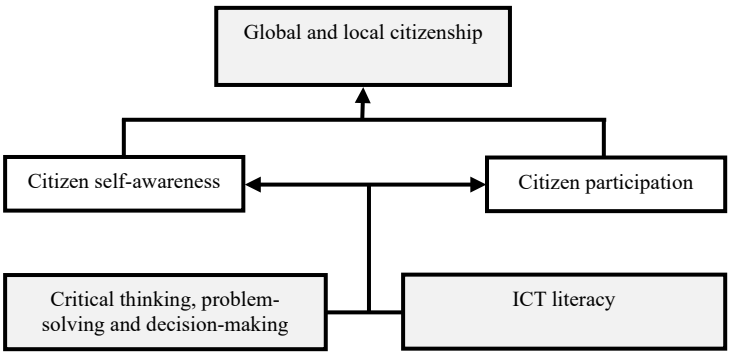


Figure 1. Integration of ATC21S skills in citizenship education

Research objectives

This research has two main objectives. First, it seeks to provide a theoretical framework for the integrated instruction and assessment of ATC21s skills related to global and local citizenship, critical thinking, and ICT literacy in Costa Rica and Japan's public schools. Secondly, it aims to offer insights on the results yielded by the assessment tools.

RESEARCH DESIGN & METHODS

Integration of ATC21S skills

This section describes theoretical considerations regarding the integration of ATC21S skills in the realm of citizen education and explains the ways these skills complement each other .

Global and local citizenship

The ATC21S model defines the comprehension of the concepts and mechanisms related to citizenship and democracy, the ability to solve local and global problems, and the involvement in community activities and electoral processes as the main knowledge and skills related to local and global citizenship. The design of learning activities addressing these knowledge and skills first require clarity around the definition of citizenship

Giroux (1989) regards citizenship as a dialogical process, in which individuals are expected to identify and change current problematic power structures, and asserts that schools must function as democratic public spheres, where students can learn the skills they need to construct more emancipating forms of community life. The design of learning activities aimed to support the instruction of global and local citizenship should incorporate the principles offered by Giroux. Namely, the instruction should go beyond conventional notions of citizenship education and provide children with opportunities to reflect on their own personal experiences, and on how these experiences relate to the whole society, as they propose solutions to the problems affecting their communities.

ICT literacy

ICT literacy involves creating media products and using appropriate digital tools to interpret and express ideas in diverse and multicultural environments. It also comprises the application of knowledge about the characteristics of different media. Depending on how they organize and convey information, specific media products can be comprehended as instances of descriptive, narrative, and expository discourse (Brewer, 1995). While narrative usually accounts for event sequences related to human intentions and actions, description conveys visual and spatial information, and exposition deals with abstract and logical information. Research suggests that narrative is the most suitable form of discourse when helping children think about local and global citizenship issues.

Storytelling activities in which students employ digital media to present their views can also contribute to the development of problem-solving and critical thinking skills (Sarica & Usluel, 2016). Moreover, as they assume the role of media creators, children can master technical aspects of digital technologies, and strengthen their identity and their sense of agency (Bjørgen, 2010). As a method for integrating the instruction of citizenship and ICT literacy, this research puts forth learning activities in which students decode and create story-based digital media in order to present their own solutions to community problems.

Critical thinking, problem-solving and decision-making

The ATC21S framework defines the importance of effective reasoning and problem-solving. Specifically, it promotes the appropriate use of deductive and inductive reasoning, the categorization and analysis of information, the presentation of conclusions based on such analysis, and the evaluation of arguments and points of view. The purpose and structure of stories are closely related to these skills. All stories contain implicit or explicit arguments, either for or against something (Gold, Thorman & Thorpe, 2002). Furthermore, they present information and opinions that can be analyzed and evaluated.

The instruction of critical thinking and problem-solving skills also plays a supporting role in the development of critical citizenship. Regarding the use of ICT in fostering active and dialogic learning, Japanese official guidelines suggest introducing thinking tools to activities that involve classifying information and establishing correlations between events and facts (Ministry of Education, Culture, Sports, Science and Technology, 2018).

Research participants

The instruction and assessment activities were implemented in two elementary schools during the 2019 school year. The first school is one is located in the Ibaraki prefecture of Japan, and the second one is located in the Alajuela province of Costa Rica. In each school, a sixth-grade class participated in the learning activities. The participants included 27 students in Japan and 26 students in Costa Rica.

Learning units

Two learning units were developed following the model proposed by Karaki (2016) as a guide for teaching civic competencies within the context of school education. Mutually supporting learning materials were created or modified for each of the four stages included in this model: problem setting, problem analysis, decision-making, and proposal and participation.

Problem setting

The first stage introduces animated films depicting community problems related to road traffic safety in the first unit, and garbage disposal in the second unit. Separate animated films were produced for each participating country, using the model for teaching through storytelling proposed by Egan (1989). According to this model, learning units must be conceived as good stories to be told, aimed to stimulate children's motivation and imagination.

Egan points out that the introduction of narrative into teaching should be guided by binary opposites, which involve the stories' underlying conflicts. These conflicts often place characters in the center of struggles between good and evil or danger and safety. By determining the binary opposites related to the issues addressed in the learning process, it becomes possible to create compelling stories that function as a basis for children to reflect and elaborate. The animated films were structured around various binary opposites, such as good and bad citizenship, and well-being and hardship.

Problem analysis

In the problem analysis stage, children employ thinking tools to assess the problems illustrated in the animated short films and propose logically-sound solutions. Children use X-charts to classify the characters of the animated films, fishbone charts to analyze the causes of the depicted problems, candy charts to infer solutions based on the previous analysis, and butterfly charts to evaluate the comics created by their peers.

Decision-making

In the decision-making stage, learners are expected to apply their judgment to make decisions about complex social issues and determine what concrete actions can be taken to secure a better future (Karaki, 2016). In order to achieve this goal, the participants are asked to imagine a story in which the problem presented in the animated film gets solved. Children organize their stories in a comic plan worksheet, based on the ideas they have previously compiled in the thinking tools.

Proposal and participation

In this stage, children utilize Voicing Board (Umegumi, n.d.) to create digital comics. Additionally, at the end of the second unit, children are asked to cast a vote on which of the comics created by their

peers depicts the best solution to the problem. For this task, three comics displaying different approaches to the problem are preselected and presented to the class. In this way, the learning units seek to convey what active, and responsible citizenship entails. Namely, students are requested to think logically about familiar problems, come up with solutions, express them in clear and persuasive ways, and validate good policies through democratic elections.

Assessment through Comic analysis

At the end of each learning unit an assessment method, based on narrative analysis, was implemented. The analysis of narrative texts involves identifiying their microstructural and macrostructural elements. While macrostructure refers to their hierarchical organization, microstructure deals with their internal structures (Justice et al., 2006). The analysis of the comics incorporates both levels. The actions and dialogs depicted in each comic panel are synthesized in one to three T-units (Hunt, 1965), which describe the microstructural elements of the story. When placed in a linear sequence, these elements also offer an overview of the story's macrostructure.

Table 1. Comic scoring criteria

Citizen self-awareness	score	Critical thinking	Score
Positive and active (Hero)	4 pts.	Logical connection + linearity	4 pts.
Positive and passive(Helper/Dispatcher)	3 pts.	Logical connection	3 pts.
Negative and passive (Victim/False Hero)	2 pts.	Linearity	2 pts.
Negative and active(Villain)	1 pt.	Neither	1 pt.

The analysis is performed in each learning unit, following two distinct procedures (table 1). The first procedure puts emphasis on the story's macrostructure and seeks to visualize the level of thinking skill application expressed in it. This procedure yields a measure defined as thinking skill score (TSS). Stories displaying linearity and logical connection between their elements are assigned a full score.

The second procedure focuses on the stories' microstructure, specifically on the individual actions of the characters. The spheres of action theory proposed by Propp (2015) is adapted to organize the comic characters in six categories, depending on how their actions relate to the problem and its solution. The objective of this procedure is to assess the citizen self-awareness level of the students, by observing how they represent the initiative and effectiveness of the child characters included in the comics. The measure obtained is named citizen self-awareness score (CSS).

RESULTS

In Costa Rica, the assessment activities were implemented in March and August of 2019, as Social Studies and Civic Education activities. In Japan, they were executed in July of 2019 and January of 2020, as Integrated Studies lessons. The learning activities that involved viewing of animated films and using worksheets were carried out in regular classrooms (five lessons), and the comics were edited in computer

classrooms (two lessons).

In the comics, the students use the characters and backgrounds featured in the animated short films to propose solutions to the problems presented in the animated films. In this way, they create an ending for the stories of the animated films. For example, in the second learning unit implemented in Costa Rica, the animated film shows how littering can cause the streets to flood and damage the ecosystem as the garbage gets washed into the rivers and oceans. As a solution to this problem, students would create stories where a group of school children work with their teacher to clean the streets of the community (figure 2).

Figure 2. Comic created by Costa Rican student

With the purpose of determining the possible effects of the learning process, paired Wilcoxon signed-rank tests were applied to compare the results obtained from the comic analysis in each unit. In Japan, the results of the second unit showed higher mean values for TSS and CSS but no significant differences were observed in any of them. In Costa Rica, the differences between the values of TSS (W_{paired}= 6, $p < 0.05$) and CSS (W_{paired}= 2.5, $p < 0.05$) of both units were statistically significant.

DISCUSSION

During the instruction process, two main tendencies were observed in both countries. The first one involves procedural issues and the application of critical thinking to problem-solving in the context of citizen education. Especially in the first unit, some children struggled to grasp the utilization procedures of the thinking tools. The teachers noticed most of such cases and provided guidance to the students. Detailed assistance was required in the lessons involving analysis (fishbone chart) and inference (candy chart), which can be considered as the most cognitively tasking activities. Despite these initial difficulties, most children were able to analyze the causes of the problem and construct comic plans based on the ideas they had expressed in the thinking tools.

The second trend is associated with the interaction of different forms of discourse within the learning units. In some instances, children took the two lessons allocated to creating the comics as a chance to expand the stories they had planned. They added new characters and depicted more complex situations than the ones they had initially proposed. Consequently, some of the final versions of the comics did not completely match the contents of the comic plans. These discrepancies indicate that the learning activities allow narrative creation to be a flexible process. The students' performance suggests that the instruction successfully established a bridge between the expository and descriptive elements (thinking tools and comic plans), and the narrative elements of the learning units (animated films and comics) .

Regarding the assessment activities, the results of the comic analysis show different trends in the participating countries. A gap between the initial levels of performance in both countries could explain these disparities. In Japan, a large proportion of students were able to obtain high scores in the first unit. Although slight increments were observed in the second unit, the good results of the first unit may have reduced the space for participants to increase their scores in the second unit. It could be argued that the learning units had a limited impact on changing the citizen self-awareness and critical thinking skills of Japanese participants. For many Japanese children, the units served mostly as an opportunity to express these attitudes and skills in novel ways. In Costa Rica, where the scores of the first unit were lower compared to Japan, many children were able to increase their scores in unit two. This tendency suggests that in settings where children have initial limitations, the creation of stories can have positive effects on boosting critical thinking and citizen self-awareness.

Further insights can be found in previous studies on how children from different cultural contexts express their ideas through narrative. Watanabe (2004) determined that, when asked to describe a story depicted in a four-panel comic, Japanese children tend to organize their ideas in mostly linear and inductive structures, in contrast with American children, who tend to highlight the conclusion of the story while using mostly deductive patterns. This study does not include the narrative patterns of Costa Rican children, but it could be suggested that they are closer to American children's patterns, as they share similar media environments and speak languages with similar grammatical structures. Considering that

the linear presentation of the actions is one of TS's indicators, the prevalence of this form of narrative structures in Japan may have affected the assessment results in favor of the Japanese children.

Finally, it must be noted that assessment methods offer reliable information only on the students' performance in the specific context of the learning experiences being evaluated. If students fail to apply specific skills and attitudes during a learning activity, it does not mean that they inherently lack the capacity to do it in other learning settings or in real life situations. This principle applies to the results presented in this paper. These results should not be considered a representation of all children's abilities in any of the participating countries, nor a definite portrayal of the participants' specific abilities. Different schools may yield different results, and any student can be expected to improve their abilities through systematic and accurate instruction. The value of this study lies in the contribution it can make to discussions on how multiple competencies can be taught and assessed in elementary school settings, and on how the combination of different assessment methods can offer relevant information on effective ways to support and transform citizenship education in classrooms worldwide.

REFERENCES

BJØRGEN, A. M. (2010). Boundary crossing and learning identities - Digital storytelling in primary schools. *Seminar.Net, 6*(2).

BREWER, W.F. (1995). To Assert that all human knowledge is represented in terms of stories is certainly wrong. In R. S. Wyer (Ed.), *Knowledge and memory: The real story. Advances in social cognition* (pp. 211-225). Lawrence Erlbaum.

EGAN, K. (1989). *Teaching as storytelling: an alternative approach to teaching and the curriculum*. University of Chicago Press.

GIROUX, H.A. (1989). *Schooling for democracy: Critical pedagogy in the modern age.* Routledge.

GRIFFIN, P., MCGAW, B. & CARE, E. (2012) *Assessment and Teaching of 21st Century Skills*. Springer.

Gold, J., Holman, D., & Thorpe, R. (2002). The role of argument analysis and storytelling in facilitating critical thinking. *Management Learning, 33*(3), 371-388.

HUNT K.W. (1965). *Grammatical structure written at three levels.* National Council of Teachers of English.

JAPAN FOUNDATION. (2019, November 30). *Report on 20th survey on 18-year-olds' awareness. Theme: Awareness on society and nation in 9 countries*.

JUSTICE, L.M., BOWLES, R.P., KADERAVEK, J.N., UKRAINETZ, T.A., EISENBERG, S.L, & GILLAM, R.B. (2006). The index of narrative microstructure: A clinical tool for analyzing school-age children's narrative performances. *American Journal of Speech-Language Pathology, 15*(2), 177-191.

KARAKI, K. (Ed.) (2016). *What are the civic competencies? Investigating the past, present and future of social studies education*. Toyokan.

MEXT. (2018). *Use and qualitative assessment of ICT for active and independent, dialogic and active learning: From the experiences of ICT schools in 2017.*

PNUD. (2013). *Informe Sobre Desarrollo Humano 2013. El Ascenso del Sur: Progreso Humano en un Mundo Diverso.*

PROPP, V. (2015). *Morfología del cuento.* Colofón. (Original work published in 1928).

SARICA, H.C. & USLUEL, Y.C. (2016). The effect of digital storytelling on visual memory and writing skills. *Computers & Education, 94*, 298-309.

UMEGUMI. (n.d). *Voicing Board Introduction*. https://bit.ly/2Bfmeui

WATANABE, M. (2004). *The structure of consent: Thought expressions styles in Japanese and American elementary education*. Toyokan.

The Usefulness of Workshops Based on the Web in School Scenes

Takeshi Goto
tk4goto074@gmail.com
Elementary School Teacher
Oji Elementary School
Nara, Japan

Abstract： In this study, in order to clarify the usefulness of teacher training based on the Web in school sites, I conducted an educational study group held at each school on the Web. As a result of analyzing the participant questionnaire, it became clear that the same viewpoint as the conventional model influenced the satisfaction of the study group even on the Web. In addition, we were able to grasp the features of the Web study group that "it is easy to match teachers together" and "we can build co-workers in a new community", and the usefulness for public teacher training and teaching practice in the future was shown.

Key words: Teacher Training, Class Research, Web Conferencing System, Workshop

INTRODUCTION

For children living in Society 5.0, effective utilization of advanced technology based on ICT (Information Communication Technology) in education is required. However, the current school ICT environment is lagging far behind due to large disparities between local governments. The Ministry of Education, Culture, Sports, Science and Technology has decided that it is crucial to develop a uniform ICT environment nationwide in this new era, and has instituted a policy to provide one machine per person, along with a high-speed, large-capacity communication network, integrating them into normal school life (The Ministry of Education, Culture, Sports, Science and Technology 2020). Two specific points are involved with this program: "(i) completing a high-speed, large-capacity communication network in schools by 2020" and "(ii) providing one computer for each child by 2023" However, regarding (ii), the plan is to be deploy them only to fifth and sixth graders this year. Moreover, it is necessary to improve both hardware and software as soon as possible in order to improve the home learning environment during school holidays due to the recent coronavirus.

However, although the use of ICT in children and students is progressing, there has been no change in the style of "teacher training" for decades. It is true that it is a very important opportunity to go to various schools and research centers, to see and listen to the classes, presentations, and lectures in front of other teachers, and to discuss them, but the effort involved in them is enormous. For example, when attending a class study group held at another school, in addition to the time required for class visits and discussions on the day, preparation time to leave the class in charge to other teachers, time for other teachers to act on behalf of, and travel time are spent. Because learning by this conventional training style is important, it has not changed for decades, but as many teachers are beginning to notice the usefulness

of Web-based interactions due to the recent coronavirus, I believe that we should review the style once again and consider a better training style.

PUBLIC TEACHER TRAINING & PREVIOUS STUDIES IN JAPAN

In Japan, legal training is provided for first-time and 10 years employees. In other career stages, it is left to the judgment of each municipality. However, depending on the career stage, there are also weak years. Therefore, more systematic training will be needed to support the "teachers who continue to learn (Ministry of Education, Culture, Sports, Science, and Technology 2015)" that the government is aiming for. In addition, most of the workshops have been forced to be canceled due to the recent influence of coronavirus. One of the reasons for this is that there is no well-established environment for advancing training on the Web. However, in the first place, since there are few cases of use of the Web in public training in educational settings, I believe that there is a large factor that "how to proceed with Web-based training." and not being able to cope with it. Therefore, it is necessary to clarify the methods, advantages, strengths, etc. for advancing Web-based teacher training now.

In Japan, some research has been studied on the type of teacher training to discuss on the Web. Sonoya et al. (2004) interacted between remote island schools and universities using Web conferencing. After college students watched a video of their elementary school class, they were able to interact effectively with the teachers of the class, interacted with them in videoconferencing, and watched real-time class. Goto et al. (2016) presented and discussed using the Web conferencing system in a community composed of seven university teachers and elementary and junior high school teachers. As a result, they got some kind of results, but they also realized problems such as "it's hard for a regular school teacher to operate on their own" and "it's hard to sit in front of a PC for 90 minutes.” In addition, Yamaguchi (2019) conducted remote joint training for the purpose of improving the training environment of small-scale schools on remote islands. Because all the teachers were doing it, many people did not actively participate in the exchange from various troubles at first. However, the participants' useful experiences increased colleagues and collaborations. Considering these previous studies, it is necessary to pay attention to the following three points in order to introduce Web-based teacher training to general public-school research groups.

(i) Ease of use and simplicity of the system
(ii) Short implementation time
(iii) Realization of usefulness

(i) is necessary to utilize equipment and systems that can be operated by all teachers in order to assume a study group for all faculty members. It is also very difficult to sit in front of the PC for a long time, as mentioned earlier, about (ii). It is necessary to keep it to the utilization within one hour at the longest. Finally, I believe that the most important thing is (iii). There is a necessity if it is used in a remote

island like Yamaguchi (2019), but in order for a general public school to dare to utilize the Web, there must be big merit there. It is necessary to make big merit that can only be obtained by utilizing the Web. I put in mind the above three points and built a Web study group system.

RESEARCH DESIGN & METHODS

In this research, we established a research community on the Web with reference to Goto (2020). In general study groups, research consultation is held after seeing the research class or after the presentation of the research. It is also an opportunity to exchange information after the end of the study group. Therefore, I constructed the system of **Table 1** so as not to impair these elements and the three points described in the previous chapter.

Table 1 Configuration & System used

Configuration	System used
Study group venue	Google Sites
Class research	Google Drive (video)
Research presentations Research consultation	Zoom
Information exchange	Slack

Table 2 Page & Contents

Page	Contents
Home	Participation in each Web conference
Schedule	Review annual appointments
Past conference	Watch past Web conference videos
Submission	Submission of manuscripts, class videos, etc.
Registration	User registration
Query	Contact administrator

Figure 1 Web pages created by Google s

First of all, I made the study group venue on the Google site as in **Figure 1** and made the page of **Table 2**. When a participant registers as a user and registers with the meeting they want to join, the Zoom meeting URL of the relevant meeting arrives. In consideration of the "(ii) Short implementation time", the conference time was within 40 minutes in principle, including presentations and discussions, and the facilitator in charge took the lead. In addition, in the class research, etc., I made it a style of watching the

class video on Google Drive in advance (only participants can view it) and then going to the meeting. In order to exchange information, I sent the participants the URL to participate in the Slack channel after the meeting, so that they could optionally participate. The meeting was recorded and uploaded to Google Drive so that participants could see it even if they were absent. The following describes the ingenuity of "(iii) realization of usefulness" which is believed to be the most important in this study.

- Regular meetings for a short period of time. (Held once a month)
  → Easy to participate, a lot of information can be obtained.
- Even if they are absent, participants can watch materials and conference videos.
  → Don't have to manage the schedule every time, and they can feel free to belong.
- There is an opportunity to exchange information after the meeting.
  → It is possible to easily match teachers with the same interests.

EXPERIMENTS

Using the system environment described in the previous chapter, a total of eight workshops were held from April 13 to July 31, 2020, and topic providers and facilitators were set up in turn. There were 5 to 9 participants each time, and the breakout session function of the Zoom was used as appropriate, depending on the number of participants. Many of the participants were teachers in their thirties and had more than 10 years of the educational experience (**Table 3**). In addition, when I conducted a questionnaire about the feeling of use of the system, I obtained the answers as shown in **Figure 2**. Although many items received positive opinions, there were teachers who felt that it was "not very easy" to operate Zoom in general and screen sharing. Therefore, I think that appropriate support is necessary when actually introducing the system.

Table 3 The actual situation of participants

Item	Mean	SD	Min	Max
Teaching experience (years)	10.13	4.58	3	16
Web conference experience (counts)	3.50	4.07	0	10
Zoom experience (counts)	4.63	4.47	0	10

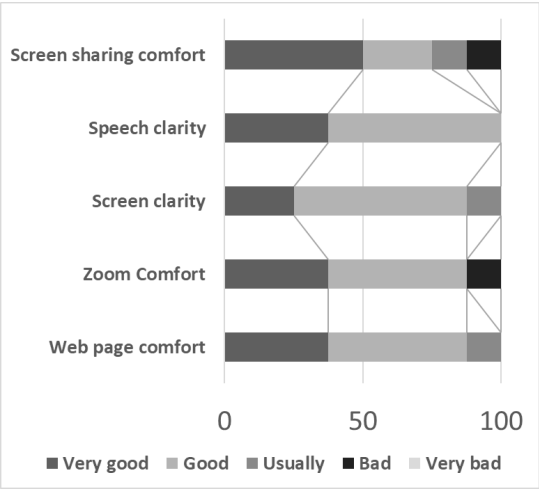


Figure 2 Evaluation of Web conference system

RESULTS

Of the multiple workshops, we decided to compare and analyze two workshops where the same person serves as presenters and facilitators, and proceed with the research (**Table 4**).First, when we asked about the satisfaction level of the workshop by a numerical index of five levels, the average score was 4 or higher as shown in **Figure 3**, but B was significantly higher than A and significantly higher at the 5% level. *(t = -2.7027, df = 9.87, p = 0.023, effect size d = -1.512, power = 0.682, two-sided test)*

Table 4 The satisfaction of each workshop (1)

	n	Mean	SD	Min.	Max.
Workshop A	7	4.0	0.5774	3	5
Workshop B	5	4.8	0.4472	4	5

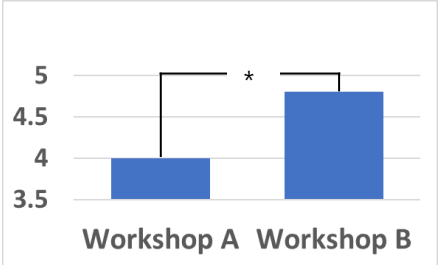


Figure 3 The satisfaction of each workshop (2)

When the factors were examined from the questionnaire and the conference video, two important viewpoints were clarified. One is "facilitation." Since there were nine participants in Workshop A, Zoom's breakout session function was utilized. However, there was a lack of meetings between facilitators for each group, and there was a gap in the pillars of the group discussion. In this way, it is important to adjust the composition, theme (pillar of discussion), time allocation, and utilization of the system for each study group, so it is important to adjust them well and create the optimal workshop. Therefore, it can be said that it is essential to create a manual that can be facilitated by everyone.

The other is "setting the contents according to the career stage. " The themes of each workshop were "About the study of mathematics classes" for A and " Changes in teacher's career and beliefs " for B. The participants in Workshop B commented, "I was excited. " There were a lot of positive comments such as. For 30s teachers who are interested in future career development, the theme of "Changes in teacher's career and beliefs" is considered to be a good combination.

From the results so far, it became clear that workshops can be conducted as teacher training that is effective enough on the Web. In addition to the actual workshop, it is necessary to "smoothly utilize the PC" by participants and hosts, but it can be seen from the results of the questionnaire that it is not such a big problem.

In this experiment, the strengths unique to Web-based were also clarified. One of them is that it is easy to match teachers. Communities by members with the same interest and career stage, same expertise, different positions, and different values, it is possible to easily build various communities on the Web in this way. Moreover, since the theme setting according to the needs of the participants is important as described above, it is possible to grasp such information easily if it is on the Web.

What is even more interesting is that even Web-based communities can build their colleagues sufficiently. Since many words "There was a sense of security that this member could self-disclose." and "Knowing each other, I thought the distance of the mind narrowed." were seen in the impression of Workshop B, it is thought that it is possible to build colleagues by meeting face-to-face on the Web and exchanging ideas even if it is never the same workplace. I wonder if it is exactly one way of the teacher group in the Society 5.0 era.

FUTURE WORKS

In the Society 5.0 era, " Building a Community of Teacher Development to Learn and Enhance Each Other (Ministry of Education, Culture, Sports, Science, and Technology 2015)" In order to achieve this goal, I believe that Web-based community construction is very important. In order for everyone to be able to operate them smoothly, it is necessary to create a manual for facilitators, etc., and to develop a matching system based on information such as age and interest for community building. Moreover, if these independent research activities by teachers are recognized as part of the public training of each municipality, it will be able to contribute to the development of "teachers who continue to learn" more effectively.

REFERENCES

The Ministry of Education, Culture, Sports, Science and Technology (2020) GIGA School Concept Realization Package.

The Ministry of Education, Culture, Sports, Science and Technology (2015) About the Improvement of the Quality Ability of the Teacher Who Will be Responsible for the School Education in the Future - Toward the Construction of the Teacher Development Community Which Learns Each Other and Enhances Each Other.

Takashi Sonoya and Toru Sekiyama (2004) Practice of the Exchange Study between College and Schools in Isolated Islands Using Videoconferencing (2*). Journal of Practical Research on Education, Faculty of Education, Kagoshima University*, 14:121-129

Yasushi Goto and Kenji Matsui (2016) Trial of In-service Teacher Training System Using Web Conference System. *Higher Education Studies, Niigata University*, 4:47-51

Sayuri Yamaguchi (2019) Development of an Online Video Conferencing Teacher Education Program: An Island Teacher's Perspective of Virtually Combining Remote Schools for Teacher Education. *Proceedings of the Digital Textbook Society of Japan,* 8(0):55-56

Takeshi Goto (2020) A Trial of an Interactive Teacher Training Using ICT. *Research Report of the Information Processing Society of Japan. Vol.2020-CE-155 No.6.*

Diversity Learning with 360-degree Videos Recorded During Students' Fieldwork

Shinichi Sato
satoshin@n-fukukshi.ac.jp
Professor
Nihon Fukushi University
Aichi, Japan

Makoto Kageto
makoto@kageto.jp
Professor
Nihon Fukushi University
Aichi, Japan

We have been using 360-degree videos at a university, to enhance students' experiential learning. Students and teachers recorded 360-degree videos during their fieldwork in developing countries and used these videos to reflect on their experiences. Younger students also watched these videos in their pre-learning to better understand what they would do in the field. From these experimental uses, we found that using 360-degree videos with a head-mounted display (HMD) may have some positive effects, both for students conducting fieldwork and for other students. The videos recorded by both students and teachers included footage of fieldwork in impoverished areas, disaster-hit areas, and local schools. We believe that these realistic experiences are crucial to properly develop and pursue diversity learning. In this study, we confirmed the potential of 360-degree videos as identified in earlier studies and discussed what factors can help implement meaningful and sustainable fieldwork incorporating 360-degree videos. The result showed that engendering empathy in students is crucial for diversity learning and can be done at low cost with 360-degree videos and HMD, and thus, that we need to focus more on the stories in the videos. Further research is required to understand what content is most effective in making students more empathetic.

Keywords: Experiential Learning, Fieldwork, Virtual Reality, 360-degree Video

INTRODUCTION

Diversity is considered crucial in university education. Gurin et al. (2002) support curricular initiatives that introduce diversity into college courses and suggest that more attention should be given to the types of experiences students have with diverse peers inside and outside the classroom. As a way to provide such experiences, many universities now have experiential learning programs. As one type of experiential learning, we have conducted overseas fieldwork both within the official curriculum of our university and as informal activities designed by students and teachers, focusing on three stages: pre-learning, on-site fieldwork, and post-learning (Sato & Kageto, 2008). The present study focuses on fieldwork activities. In this paper, the word "fieldwork" is used in a broad sense to include various activities conducted by students outside the university setting, not necessarily in a highly technical research area; teachers expect fieldwork to promote positive attitudes and independent thinking among students. We also investigated the use of 360-degree videos in such fieldwork; from the observations of students who viewed the 360-degree videos of their own and each others' fieldwork, we found that

viewing 360-degree videos had several benefits, such as finding details that they did not notice during the on-site experience and recalling emotional aspects that would lead to better learning and deeper reflection (Sato & Kageto, 2020).

Based on these studies, we would like to discuss the benefits of 360-degree videos for sustainable fieldwork, including pre- and post-learning with the videos, which students can do autonomously and independently. We first conduct a literature review to consider the crucial factors in 360-degree video use and the appropriate environment in which to use such videos. We also discuss how we can actualize such fieldwork.

VIRTUAL REALITY USE IN EDUCATION

Effects of Immersion

Immersion, which is one of the critical features of virtual reality (VR), is compatible with stimulating empathy. The positive effects of immersion have been reported in various fields (Bailenson, 2018); for example, the appearance and action of a person's self-representations affect his or her behaviors (Bertrand et al., 2018; Yee & Bailenson, 2007). When we use a head-mounted display (HMD), a user's field of view is entirely surrounded by a computer-generated image of the video shown in the HMD, which makes it easier to concentrate on the video. The user can then more easily gain a sense of the flow of the story in the virtual world (e.g., Dalgarno & Lee, 2010). As this suggests, when people experience other people's viewpoints with appropriate VR content, they can better empathize with those people. Applying this to fieldwork, this means that an immersive environment has the potential to help a student feel sensations similar to those felt by the person who recorded the 360-degree video at the fieldwork site. This feature can aid diversity learning, in which taking other people's perspective is necessary.

Educational Use of 360-degree Videos

The capabilities of VR have advanced significantly in recent years, and the cost of implementing VR has dramatically decreased. The virtual world, carefully implemented, has autonomy; users can move around freely and interact with objects there. However, it still takes considerable time, effort, and money to develop VR content, although it can be distributed on a massive scale once developed (e.g., Bailenson, 2018). Using a 360-degree camera, however, we can record video in all directions and experience it just by sending the recorded videos to an HMD. Although interaction within the virtual world using this approach is more limited, the sense of immersion is still high, and it is has become increasingly popular. We can find examples used in education (Magnor & Sorkine-Hornung, 2020; Southgate, 2020). Jong et al. (2020) described an inquiry-based learning procedure in which they used 360-degree videos to give a

fieldwork-like experience to students learning geography. Onishi (2019) confirmed that students who used HMD to watch 360-degree videos taken from the viewpoint of a student in a wheelchair empathized with the student more than before.

Media Environment in Which to Experience 360-degree Videos

360-degree videos can be watched not only on an HMD but also on a computer or a smartphone. However, Selzer et al. (2019) analyzed the relationship between virtual presence and learning outcomes and found that HMD was more effective than watching 360-degree videos on a desktop computer with a mouse. They also found that even low-end HMD, used with a smartphone, was as effective as high-end HMD. 360-degree videos can be readily watched on websites such as YouTube, and we can find some HMD devices that can be used with a smartphone at, for instance, one-dollar shops. It is, thus, possible to deliver one student's fieldwork experience to other students at a low cost without sacrificing the sense of immersion.

IMPLEMENTATION OF FIELDWORK WITH 360-DEGREE VIDEOS

From the literature review described above, we expect watching 360-degree videos with HMD will foster empathy, an essential element of diversity learning. We have recorded many 360-degree videos so far during fieldwork. Our university provides two main kinds of fieldwork opportunities for students: faculty-driven fieldwork within the university curriculum, in which the core schedule is set by faculty members who also participate in the fieldwork; and student-driven fieldwork, in which students are expected to plan learning activities for themselves, sometimes supported by teachers. Students can earn certain credits if their activity plan and final report are approved by faculty. Through such fieldwork, students and teachers have recorded, using a 360-degree camera, both official activities and casual scenes of their daily life in different cultures. The typical recorded videos include scenes in which students visit a poor community affected by development activity, and in which students conduct volunteer work in a local school.

To implement autonomous fieldwork with 360-degree videos, we need to think about how students take videos in the field, and how they store and share those videos for themselves and other students. In our practice, students sometimes found it difficult to take videos while they were desperate to face novel situations in an unfamiliar place. Preparing guidelines and practicing the use of the camera before the visit worked well. The students did not have to worry about the details when taking the videos, because a 360-degree camera records in all directions; all they were required to do was keep the camera at eye height, and in some settings, such as a groupwork with local students, just putting the camera on a tripod worked well. However, as Shin (2018) pointed out, not only images but also meaningful narratives are important to help students feel empathy. It may include authoring issues after taking videos; however, we still need

to consider more detailed guidelines for taking effective videos for diversity learning. In the future, we intend to explore what scenes should be captured by conducting experiments to observe how students watch 360-degree videos and what they learn from them. We will update guidelines by referring to knowledge of how to record 360-degree videos in a way that makes for a better experience with an HMD (e.g., Sato & Kageto, 2020; Wehking et al., 2019).

For the practical use of 360-degree videos with an HMD, we also need to consider how to encourage students to watch recorded 360-degree videos. In our experiments so far, we have used dedicated HMDs such as Oculus Go and HTC Vive. However, as described above, it is possible to achieve a sufficient sense of immersion even with a low-end HMD used with a smartphone, including by using websites such as YouTube and Facebook. As a next step, we will develop a web archive of 360-degree videos, conduct experiments with more students, and pursue more meaningful fieldwork for diversity learning.

REFERENCES

Bailenson, J. (2018) *Experience on demand: What virtual reality is, how it works, and what it can do.* W. W. Norton & Company.

Bertrand, P., Guegan, J., Robieux, L., McCall, C. A., & Zenasni, F. (2018). Learning empathy through virtual reality: Multiple strategies for training empathy-related abilities using body ownership illusions in embodied virtual reality. *Frontiers in Robotics and AI, 5*, 26.

Dalgarno, B., & Lee, M. J. (2010). What are the learning affordances of 3-D virtual environments? *British Journal of Educational Technology, 41*(1), 10–32.

Gurin, P., Dey, E., Hurtado, S., & Gurin, G. (2002). Diversity and higher education: Theory and impact on educational outcomes. *Harvard Educational Review, 72*(3), 330–367.

Jong, M. S. Y., Tsai, C. C., Xie, H., & Wong, F. K. (2020). Integrating interactive learner-immersed video-based virtual reality into learning and teaching of physical geography. *British Journal of Educational Technology*. https://doi.org/10.1111/bjet.12947

Magnor, M., & Sorkine-Hornung, A (Eds.). (2020). *Real VR—immersive digital reality: How to import the real world into head-mounted immersive displays*. Springer Nature.

Onishi, A. (2019) Fostering thoughtfulness through 360-degree video immersive experience. In *Proceedings of International Conference for Media in Education 2019*, 423–425.

Sato, S., & Kageto, M. (2020). The use of 360-degree videos to facilitate pre-learning and reflection on learning experiences. *International Journal of Innovation and Learning, 27*(4), 381–394.

Sato, S., & Kageto, M. (2008). A case of an overseas study tour: Based on an international collaborative learning model. *International Journal for Educational Media and Technology, 2*(1), 79–88.

Selzer, M. N., Gazcon, N. F., & Larrea, M. L. (2019). Effects of virtual presence and learning outcome using low-end virtual reality systems. *Displays, 59*, 9–15.

Shin, D. (2018). Empathy and embodied experience in virtual environment: To what extent can virtual reality stimulate empathy and embodied experience? *Computers in Human Behavior, 78*, 64–73.

Southgate, E. (2020). *Virtual reality in curriculum and pedagogy: Evidence from secondary classrooms.* Routledge.

Wehking, F., Wolf, M., Söbke, H., & Londong, J. (2019). How to record 360-degree videos of field trips for education in civil engineering. In *Proceedings of DELFI Workshops 2019.* Gesellschaft für Informatik eVz. https://doi.org/10.18420/delfi2019-ws-120

Yee, N., & Bailenson, J. (2007). The Proteus effect: The effect of transformed self-representation on behavior. *Human Communication Research, 33*(3), 271–290.

Development and evaluation of online educational materials for understanding advertisements: Learning persuasive techniques and dietary knowledge

Kanae Suzuki
kanae@slis.tsukuba.ac.jp
Professor
University of Tsukuba,
Tsukuba, Japan

Aya Momose
m0m0.a8.mast@gmail.com
NTT DOCOMO
Chiyoda-ku, Japan

Teiichi Nishioka
nishioka@slis.tsukuba.ac.jp
Professor Emeritus
University of Tsukuba,
Tsukuba, Japan

Abstract
Advertisements are one of the targets studied in media education. The understanding of persuasive techniques (e.g., nutrition claims) and dietary knowledge (e.g., nutrition facts) are necessary to prevent the negative effects of exposure to advertisements for less healthy foods and beverages. In this study, two types of online educational materials based on media and dietary education programs were developed (Study 1) and examined the effects of the materials (Study 2) on students' understanding of persuasive techniques and the acquisition of dietary knowledge. In Study 1, based on previous studies, acts, and materials published by the Ministry of Agriculture, Forestry and Fisheries, Consumer Affairs Agency, and so on, contents that persuasive techniques in advertising make products appear healthier and more attractive, and that these techniques can emphasize some information about the products were included in the media education program. The dietary education program contained explanations to increase students' knowledge about food (e.g., nutrition fact labels, nutrition facts for good health) and understand the importance of confirming nutrition facts labels and ingredients. In both programs, we compiled the program contents into a movie, which could be used as an online source of educational material. In Study 2, 24 undergraduates participated in an experiment. Each was randomly assigned either to a group that individually viewed the two online educational materials (movies with PowerPoint slides and audio developed in Study 1) or a control group that watched a movie about strolling through a foreign town. After each group's viewing session, participants watched the two commercials for less healthy beverages that contained nutrition claims and some other persuasive techniques, and they were asked to answer two questions using the free-response description method. They were asked which persuasive techniques were used in the commercials to show the products more attractively and what they paid attention to while watching the commercials. The results showed that more in the group that watched the online educational materials described the nutrition claims. Few in both groups answered about nutrition facts for good health and the importance of confirming the details of nutrition facts labels and ingredients. This confirmation is extremely important to understand the bias of advertising. It is also necessary to include an explanation of the dietary knowledge that is relevant to nutrition claims in persuasive techniques in future educational materials.

Key words: Advertisements, Educational materials, Nutrition claims, Dietary knowledge

INTRODUCTION

Necessity of education on less healthy food and beverage advertisements

Extensive studies have found that we are exposed to a significant number of less healthy food and beverage advertisements, and this exposure is associated with food and beverage consumption and health problems such as obesity (e.g., Harris, Bargh, & Brownell, 2009).

These advertisements include a variety of persuasive techniques that make products look attractive and healthier than they are (e.g., celebrity endorsements, demonstrations of eating or drinking behaviors, nutrition claims, storylines, related products, emphasis on quality, premium offers) (e.g., Hebden et. al., 2011; Jenkin, Madhvani, Signal, & Bowers, 2014; Suzuki & Nelson, 2018). One of the techniques employed to make less healthy foods and beverages look healthier is to display nutrition claims. Nutrition claims mean any representation which states, suggests or implies that a food (/beverage) has particular nutritional properties including but not limited to the energy value and to the content of protein, fat and carbohydrates, as well as the content of vitamins and minerals (Food and Agriculture Organization of the United Nations, 2013). Using health messages for less healthy food presents the risk of a biased image of the products (i.e., they are 'healthy').

For the influence of less healthy food or beverage advertising, it is necessary to enhance a positive attitude that we learn in media education, rather than accepting uncritically information received from mass media when we judge whether or not the information is appropriate. Traditional media education consists of analyzing media messages. However, in Japan, media education has not been incorporated into the public curriculum, and there is very little development of educational programs and educational materials (Suzuki, 2009).

Takahashi and Mizuo (1993) have pointed out that some TV commercials provide misleading nutritional information in order to encourage consumers to buy the advertised product, it is necessary for consumers to acquire nutritional knowledge. Japanese schools have provided dietary education to children. According to the Ministry of Health, Labor and Welfare (2016), dietary education is imparted to teach people about diet and nutrition and how to select appropriate food.

Purpose of the study

In this study, two types of online educational materials based on media and dietary education programs were developed (Study 1) and examined the effects of the materials (Study 2) on students' understanding of persuasive techniques and the acquisition of dietary knowledge.

STUDY 1

Development of the educational material based on media education program

Aims of media education program. The educational objective of the media education program was to teach people how persuasive advertisement techniques make products appear healthier and more attractive and how these techniques only emphasize some information about the products.

Program structure. For the media education program, we referred to the program developed by Nakanishi and Takemi (2011) for elementary school students. They used product packaging and TV commercials so that students found persuasive techniques from them. Our educational program presented the images of confectionery packages and TV commercials. We focused on some techniques (nutrition claims; usage of celebrities; demonstrations: eating or drinking behaviors) that have been frequently used in Japanese TV commercials.

Of these techniques, the explanation focused on that of presenting nutrition-emphasized information, especially in relation to the health image of a product. The program explains the definition and content of nutrition claims as knowledge about the techniques that make products appear attractive on TV commercials, and also explains the effect of usage of celebrities and demonstrations like eating or drinking behaviors. We prepared two TV commercials (30 seconds) along with images of two confectionery packages to explain these techniques. One TV commercial and image included the technique of nutrition claims, and the other did not. Both commercials and images included the techniques of usage of celebrities and demonstrations. Table 1 shows the questions and explanations in the media education material.

Development of the educational material. The above-mentioned program was composed of slide documents. Questions and explanations on the technique of nutrition claims were contained in twelve slides, and those on other techniques were contained in sixteen other slides. The last one slide (Slide29) showed the final summary of the program. We compiled the program contents into a thirteen-minute movie with PowerPoint slides and audio, which could be used as an online source of educational material.

Development of the educational material based on dietary education program

Aims of media dietary education program. The aim of the dietary education program was to increase knowledge about food and teach the importance of confirming nutrition facts labels and ingredients.

Program structure. Regarding dietary knowledge, the program focused on the national food labeling standards as related to nutrition claims such as “calorie free,” types and roles of good nutrients for the body, and types and roles of food additives. Based on the “Food Safety Supplementary Reader” (Toyama Prefectural Agricultural Food Division, 2013), we included the habit of confirming nutritional

facts labels and ingredients as these labels are important resources for understanding the content of food and making appropriate selections when buying it.

To highlight the importance of confirming nutrition facts labels and ingredients, we presented the images of confectionery packages and explained that we can select healthier food if we pay attention to and the information on nutritional facts labels and ingredients. We explained that some food additives require special attention to artificial sweeteners (e.g., people with certain diseases), and food and beverages that appear healthy also contain food additives. At this point, it is necessary to include the explanation about the importance of confirming nutrition facts labels and ingredients.

Table 1: Questions and explanations in the media education material

Knowledge of persuasive techniques	Questions	Contents
Nutrition claims	Q1 Do you know what techniques are used to make products appear more attractive in commercials? (Slide1)	1) Introduction of persuasive techniques in advertising (Slide2) 2) Nutrition claims (Slide 3 to Slide12) - Definition - Categories and contents of nutrition claims: nutrient content claim, nutrient comparative claim, non-addition claim - Presentation of two images of confectionery packages with nutrient content claim ("Each contains one lemon's worth of Vitamin C", "High in dietary fiber"), and nutrient comparative claim ("50% lower carbohydrates")
Nutrition claims and other persuasive techniques	Q2 Do you know what other techniques (other than nutrition claims) are used? (Slide13)	1) Trials to find persuasive techniques: usage of celebrities, demonstrations of eating or drinking behaviors (Slide14 to Slide16, Slide18 to Slide20) - Presentation of two TV commercials of chocolate confectionaries* including and excluding nutrition claims *: The brand of these products were same. One of them used usage of celebrities, and both used demonstrations of eating or drinking behaviors. - Trials: after viewing the commercials, we asked the subjects if there were nutrition claims in the commercials. 2) Nutrition claims (Slide21 to Slide25) 3) Other persuasive techniques: usage of celebrities, and demonstrations of eating or drinking behaviors (Slide17, Slide 26) 4) Nutrition facts labels: Even if commercials present healthier images with using nutrition claims, those products contain additives. (Slide 27) 5) Effect of nutrition claims: the commercials which included nutrition claims made the product appear healthier. (Slide28)

We prepared two kinds of questions to increase dietary knowledge and to show the importance of confirming nutrition facts labels and ingredients. After participants had considered the answers, we included explanations of the important points for each question. In the explanations, we also included content that made it possible to recognize the importance of each confirmation. Table 2 shows questions and explanations related to dietary knowledge.

The question on the importance of confirming nutrition facts labels and ingredients was "Q3 Do you have a good view of nutrition facts labels and ingredients?" After participants answered this question, as described above, we explained that if we can read and understand nutrition facts labels and ingredients on packages, it is possible to select more appropriate food.

Development of the educational material. The first slide presented a question to teach students how to select foods with a focus on health. The next nine slides contained two questions and explanations on the national food labeling standards regarding nutrition claims. After the slide on Q3 regarding the importance of confirming nutrition facts labels and ingredients, five slides on types and roles of good nutrients for the body and seven slides on types and roles of food additives were introduced. Both included one question. The last slide (Slide 24) showed the final summary of the program. We compiled the program contents into a twelve-minute movie with PowerPoint slides and audio, which could be used as an online source of educational material.

STUDY 2

Research design and Methods

Experimental design and subjects. Twenty-four undergraduates (5males and 19 females) participated in an experiment. Each was randomly assigned either to an experimental group that individually viewed the two online educational materials (movies with PowerPoint slides and audio developed in Study 1) (N=13) or a control group (N=11) that watched a twenty-two-minutes movie about strolling through a foreign town.

Item. Subjects were asked to answer two questions using the free-response description method. They were asked which persuasive techniques were used in the commercials to show the products more attractively and what they paid attention to while watching the commercials.

Procedure. Works were conducted individually in the experiment. After each group's viewing online session, participants watched the two commercials (fruit juice and probiotic drink) for less healthy beverages. The fruit juice commercial used nutrition claims and demonstrations as persuasive techniques. Whereas, the probiotic drink commercial used usage of celebrities and demonstrations. The order of the presentation of the educational materials and commercials were counter-balanced.

Study 2 was conducted with the approval of the Research Ethics Review Committee, Faculty of Library, Information and Media Science, University of Tsukuba.

Table 2: Questions and explanations in the dietary education material

Dietary knowledge	Questions	Contents
National food labeling standards regarding nutrition claims	Q1 Do you understand the difference between "light calorie", "non-calorie", "calorie free" and "low calorie"? (Slide2) Q2 Does the nutrition claim of "calories free" mean 0 kcal? (Slide4 and Slide8)	1) Calorie labeling in food labeling standards: label of "free" or "no" (e.g., "calorie free," "no calorie"), label of "low": (e.g., "low calorie," "light calorie") (Slide3) 2) Difference in the two labels of "free" or "no" and "low" (Slide5) - Presentation of the image of the jelly package with "low-calorie" and nutrition facts labels to confirm actual calorie content (Slide6 and Slide7) - Explanation of the labeling of "calorie free": it does not actually mean that the product has no calories according to the national food labeling standards (Slide9) 3) Summary (Slide10) -In order to display "low calorie" or "calorie free," the nutrition facts labels must be displayed. -It is important to verify the contents and their volumes as presented in the nutrition facts labels without being confused by attractive expressions.
Types and roles of good nutrients for the body	Q3 Do you have a good view of nutrition facts labels and ingredients? (Slide11) Q4 Do you know ingredients that are good for your body (e.g., vitamins, dietary fiber)? (Slide12)	1) Types and effects of nutrition facts labels - dietary fiber, iron, calcium, potassium, and vitamin (Slide13, Slide14, and Slide15) 2) Summary: - It is important to deepen our knowledge about the components that we have simply think of as being "somehow good for our health" without leaving any doubts. (Slide16)
Types and roles of food additives.	Q5 Do you know about food additives? (Slide17)	1) Definition of food additives (Slide18) 2) Types and effects of food additives: additives to improve taste and fragrance, to maintain food quality, and to shape food and give it a specific texture (Slide19) - Special attention to artificial sweeteners (e.g., for people with certain diseases) (Slide20) - Presentation of the image of the confectionary package with "High in dietary fiber" and food additives in ingredients label (Slide21 and Slide22) 3) Summary: (Slide23) -It is important to consider whether the products we believe to be healthier foods may actually contain food additives and to verify nutrition facts labels and ingredients.

Results and discussion

The three persuasive techniques that were used in the commercials and explained in the educational materials were nutrition claims, usage of celebrities, and demonstrations of eating or drinking behaviors. Therefore, these keywords and related explanations were extracted from the free descriptions of each

question: the persuasive techniques used in the commercials to present the products in a more attractive manner and what they paid attention to while watching the commercials. Where each of the appeals was present in the descriptions, we marked it as "1," while we marked it as "0" in the absence of such descriptions. Table 3 shows percentage of subjects who described persuasive techniques.

A chi-square test was performed to examine the relation between the group and each description of nutrition claims, usage of celebrities, and demonstrations as persuasive techniques in the commercials. When subjects viewed the fruit juice commercial where nutrition claims and demonstrations were used as persuasive techniques, the relation between the group and the description of nutrition claims was significant, X^2 (1, N = 24) = 8.06, p<.01**.** The experimental group described nutrition claims in their responses more than the control group. Whereas, there were no significant differences between the experimental group and the control group regarding the usage of celebrities and demonstrations. When viewing the probiotic drink commercial where the usage of celebrities and demonstrations were used as persuasive techniques, the relation between the group and each description of nutrition claims, the usage of celebrities, and demonstrations was significant, X^2 **(**1**,** N **=** 24**)** = 8.36, p<.01, . X^2 (1, N = 24) = 5.92, p<.05*,* X^2 (1, N = 24) = 11.04, p<.01. The experimental group described these techniques more than the control group.

A chi-square test was performed to examine the relation between the group and the descriptions of what they paid attention to while watching the commercials. When subjects watched the probiotic drink commercial as well as the fruit juice commercial, the relation between the group and the description of the nutrition claims was significant, X^2 (1, N = 24) = 6.77, ***p*<.**01*,* X^2 (1, N **=** 24) = 8.07, p<.01**.** The experimental group described nutrition claims in their responses more than the control group. Whereas, there were no significant differences between the experimental group and the control group regarding the usage of celebrities and demonstrations.

The reason behind there being few descriptions of the demonstrations after watching the fruit juice commercial is considered to be that the image of the demonstration was relatively small and difficult for the subjects to understand. In addition, the reason why nutrition claims were described in the responses to

Table 3: Percentage of subjects who described persuasive techniques

Fruit juice			Probiotic drink		
	Experimental group (*N*=13)	Control group (*N*=11)		Experimental group (*N*=13)	Control group (*N*=11)
PT_NC	84.6%	27.3%	PT_NC	53.8%	0%
PT_UC	7.7%	0%	PT_UC	84.6%	36.4%
PT_D	0%	0%	PT_D	76.9%	9.1%
A_NC	69.2%	9.1%	A_NC	46.2%	0%
A_UC	15.4%	0%	A_UC	15.4%	9.1%
A_D	7.7%	0%	A_D	0%	0%

Note: PT_NC: nutrition claims as persuasive techniques, PT_UC: usage of celebrities as persuasive techniques, PT_D: demonstrations as persuasive techniques, A_NC: attention to nutrition claims, A_UC：attention to usage of celebrities, A_D: attention to demonstrations

the probiotic drink commercial is that several subjects believed Bifidobacteria was a component of the nutrition claims. They are restricted to a) energy/calories, b) fat, c) saturated fat, d) sugars, e) sodium/salt, f) cholesterol, g) protein, h) dietary fiber, or g) vitamins and minerals (Food and Agriculture Organization of the United Nations, 2013). However, this aspect was not explained in detail in the educational materials developed in Study 1. It is necessary to include this explanation in future educational materials, as well as the effects of advertising that includes other nutrition facts for good health.

Thus, it was suggested that the educational materials developed in this study had a certain effect on the understanding of nutrition claims and other techniques. However, despite the explanation in the dietary educational material, few subjects in both groups provided answers about nutrition facts for good health and the importance of confirming the details of nutrition facts labels and ingredients.This confirmation is extremely important to understand the bias of advertising. It is also necessary to include an explanation of the dietary knowledge that is relevant to nutrition claims in persuasive techniques in future educational materials.

ACKNOWLEDGMENTS

This work was supported by JSPS KAKENHI Grant Numbers JP 17K00459.

REFERENCES

Food and Agriculture Organization of the United Nations (2013). “Guidelines for Use of Nutrition and Health Claims”, http://www.fao.org/ag/humannutrition/32444-09f5545b8abe9a0c3baf01a4502ac36e4.pdf

Harris, J. L., Bargh, J. A., & Brownell, K. D. (2009). “Priming effects of television food advertising on eating behavior”. Health Psychology, 28: 404-413.

Hebden, L., King, L., & Kelly, B. (2011). “Art of persuasion: An analysis of techniques used to market foods to children”. Journal of Paediatrics and Child Health, 47: 776-782.

Jenkin, G., Madhvani, N., Signal, L., & Bowers, S. (2014). “A systematic review of persuasive marketing techniques to promote food to children on television.” Obesity Reviews, 15: 281-293.

Ministry of Health, Labor and Welfare (2016), “Basic plan to promote dietary education (third edition)”, https://www.mhlw.go.jp/file/06-Seisakujouhou-10900000-Kenkoukyoku/0000129496.pdf (in Japanese).

Nakanishi, A., and Takemi, Y. (2011). “Developing a media literacy nutrition education program for school children: A trial for sixth-grade children at an elementary school in Tokyo”. Japanese Journal of School Health, 52: 454-464.

Suzuki, K. (2009). Media education in Japan. In C. K. Cheung (Ed.), “Media Education in Asia” (pp.131-155). Springer.

Suzuki, K. and Nelson, M. R. (2018). “A content analysis of USA food and beverage advertisements on children’s television: Focus on health promotion and other persuasion techniques”. 2018 Global Marketing Conference at Tokyo Proceedings, 229-233.

Takahashi, K. and Mizuo, N. (1993). “Understanding broadcasting state of advertisements related to food on TV and the problems among students affiliated with school of education”. Research in educational practice and development, Gunma University, 10: 168-180. (in Japanese)

Toyama Prefectural Agricultural Food Division (2013). “Food Safety Supplementary Reader”. (in Japanese)

Exploring the relationship between visually salient feedback and gaming behavior in educational games

Yeaeun Gong
gye1121@snu.ac.kr
Master student
Seoul National University
Seoul, Republic of Korea

Gahgene Gweon
ggweon@snu.ac.kr
Professor
Seoul National University
Seoul, Republic of Korea

Educational games seek to achieve educational goals through repetitive play, but not all repetitive plays are conducive to learning. Typically, 'gaming' is an act in which learners solve problems quickly, randomly, and without thinking deeply. In this study, we explored how visually salient feedback in educational games relates to a learner's gaming behavior. Here, the 'visually salient feedback' is provided by a red background screen when a learner solves a problem incorrectly. Since gaming behavior is usually observed when learners do not pay attention to the educational content, we hypothesize that a learner would be more attentive in games where visually salient feedback is provided, and this will be closely associated with significantly less number of gaming behavior. Our data was collected from "KitKit School", a tablet-based educational game application designed for children from pre-K to grade 2 in elementary school. From KitKit school, we selected 6 games: three games providing visually salient feedback, and three games providing visually non-salient feedback. A total of 439,089 problems from 411 students were analyzed in the three game pairs with three types of UI: '1 slot-10 cards', '1 slot-<= 5 cards', 'many slots-many cards'. Analysis with Chi-Square test showed less amount of gaming behavior observed in games with visually salient feedback than in games with visually non-salient feedback in all three types of UI ('1 slot-10 cards' ($\chi^2(1)=1832.2$, p<.001), '1 slot-<= 5 cards' ($\chi^2(1)=261.1$, p<.001), and 'many slots-many cards' ($\chi^2(1)=43.497$, p<.001)).

Key words: Learning Analytics, Educational game design, Gaming behavior, Feedback, Salience

INTRODUCTION

Educational games seek to achieve educational goals by adding 'fun' elements and promoting repetitive play (Kim et al., 2009; Divjak, & Tomić, 2011), but not all repetitive plays are conducive to learning. Typically, 'gaming' is an act in which learners solve problems quickly, randomly, and without thinking deeply (Wise, 2017; Baker et al., 2004). Such a 'gaming' behavior is frequently observed in a variety of online learning environments (Cheng, & Vassileva, 2005; Aleven et al., 2001; Magnussen, & Misfeldt, 2004) and research shows that 10 to 40% of learners engage in gaming behavior (Baker et al., 2008). Various factors can contribute to a learner's gaming behavior. For example, when learners feel

bored or are placed in a low-stake situation for learning achievement, learners tend to pay less attention to their tasks and display more gaming behavior (Baker et al., 2008; Wise et al., 2009). Thus, designing games that can increase a learner's level of attention might reduce gaming behavior, but prior research did not explore the relationship between the two variables. Since visually salient feedback is known as a design element that can help learners to pay attention (West et al., 2008; Carrasco, 2011; Treue, 2003), we investigated the relationship between visually salient feedback and gaming.

Research Question: What is the relationship between visual salience of feedback and gaming behavior?
Hypothesis: Compared to games that provide visually non-salient feedback, games that provide visually salient feedback will be associated with lower frequency of gaming behavior.

In this study, big data analysis was performed using log data of "KitKit School", a tablet based educational game which is designed to teach mathematics for children in developing countries. In KitKit School, certain games provide 'visually salient feedback' by instantly displaying red background color on the screen when a learner solves a problem incorrectly. Presenting a strong contrast in a 'color dimension' is one of the methods widely used to produce salient stimuli (Wolfe, & Horowitz, 2004). Therefore, we hypothesize that a learner would be more attentive in games when such visually salient feedback is provided, and this will be closely associated with significantly less number of gaming behavior.

The rest of the paper is organized as follows. In the "Research Design & Method" section, we present six types of games and gaming schema used to identify gaming behavior. The six games are separated into two groups; games with visually salient feedback and games with visually non-salient feedback. The "Result" section reports comparative analysis result of the relationship between visually salient feedback and gaming. Next, in the "Discussion" section, further research is discussed, followed by "Conclusion".

RESEARCH DESIGN & METHOD

KitKit School

"KitKit School" is a tablet-based educational application developed for children in developing countries, and its primary goal is to develop students' reading, writing, and mathematical proficiency. The target age group is pre-K to grade 2 in elementary school. KitKit school contains a total of 20 mathematical games addressing different subtopics, including addition/subtraction, and quantity discrimination.

Feedback Type	Game picture	Game name: description (Topic)	UI group (slot – card)
Visually salient feedback		Bugmath: Choose answer card from 10 cards (Addition/Subtraction)	1 slot – 10 cards (1 slot – 10 cards)
		Numbertrain#2: Choose answer card from 5 cards (Quantity Discrimination)	1 slot – <= 5 cards (1 slot – 5 cards)
		Numbertrain#1: After understanding the rule, put cards in correct order (Identification of rule / Missing Number)	many slots – many cards (5 slots – 5 cards)
Visually non-salient Feedback		Missingnumber#1: Choose answer card from 10 cards (Identification of rule / Missing Number)	1 slot – 10 cards (1 slot – 10 cards)
		Feedingtime: Choose answer card from 3 cards (Quantity Discrimination)	1 slot – <= 5 cards (1 slot – 3 cards)
		Missingnumber#2: After understanding the rule, put correct answer cards (Identification of rule / Missing Number)	many slots – many cards (2 slots – 10 cards)

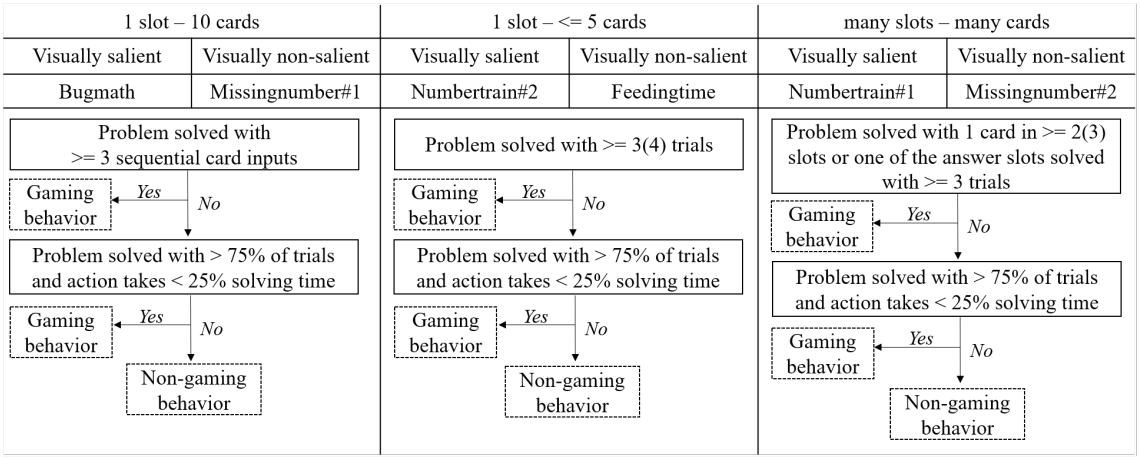
[Figure1] Description of three UI groups

Data log & Game selection (UI groups)

The log data used in the study is collected from children who played "KitKit School" freely in classrooms from May 2018 to January 2019. To examine the relationship between the visual salience of the feedbacks and gaming behavior, we selected 6 games: 'Numbertrain#1', 'Numbertrain#2', 'Bugmath', 'Missingnumber#1', 'Missingnumber#2', and 'Feedingtime'. The three selection criteria are (1) teaching about number sequence or addition/subtraction, and (2) having a game that is similar in UI except in terms of visual salience of feedback (3) having a game that is identical in mathematical difficulty. A total of three UI groups were selected, and the descriptions of the six games in the three groups are shown in Figure 1.

Gaming behavior schemas

To determine whether a learner's action is a gaming behavior, we defined the action of gaming for each of the three UI groups; '1 slot-10 cards', '1 slot-<= 5 cards', 'many slots-many cards'. For each UI group, two types of gaming actions, which were adopted from previous studies (Baker et al., 2004; Muldner et al., 2011), were identified: (1) inputting an answer in sequentially or systematically (2) inputting an answer quickly or repeatedly.



[Figure2] Gaming schemas used in three UI groups

To calculate the gaming behavior rate per game, we divided 'total number of problems that employed gaming action' by 'total number of problems in a game'. Figure 2 shows how the four variables of 'number of sequential card inputs', 'number of trials', 'solving time', and 'whether one card is used as inputs for multiple slots' were used to determine whether a given problem employed a gaming action.

Statistical method

A Chi-Square test was performed to see if there was a difference in the ratio of gaming behavior in the three game pairs depending on the visual salience of feedback. Chi-Square test is a statistical test used when all the variables are categorical variables. Because it verifies whether the observed frequency differs significantly from the expected frequency of each group, the analysis can be performed even if the number of inter-group analytical units compared is different.

RESULT

In this study, we looked at how the provision of visually salient feedback in educational games relates to gaming behavior through a total of three game pairs ('1 slot-10 cards', '1 slot-<= 5 cards', and 'many slots-many cards'). Specifically, within the three pairs of games, we expected that gaming behavior would be less observed in games which visually salient feedback were provided than games where visually non-salient feedback were provided. The descriptive statistics for each game pairs analyzed, and Chi-Square

statistics are presented in Table 1. According to Chi-Square test analysis, less gaming behavior was observed in games that provided visually salient feedback than games that provided visually non-salient feedback in '1 slot-10 cards' ($\chi^2(1)$=1832.2, p<.001), '1 slot-<= 5 cards' ($\chi^2(1)$=261.1, p<.001), 'many slots-many cards' ($\chi^2(1)$=43.497, p<.001). Moreover, a comparison of whether or not visually salient feedback is provided in the game, regardless of UI, also confirmed our hypothesis ($\chi^2(1)$=1607.6, p<.001).

[Table 1] Descriptive statistics and Chi-Square statistics for gaming behavior

UI group		Visually salient feedback	Visually non-salient feedback
1 slot-10 cards		Bugmath	Missingnumber#1
	N(problem)	49,013	21,718
	Mean(SD)	0.0581(0.2340)	0.1573(0.3641)
	gaming	3417	2850
	non-gaming	18301	46163
	Chi-Square	**$\chi^2(1)$ = 1832.2, P-value = 0.00000*** **	
1 slot-<= 5 cards		Numbertrain#2	Feedingtime
	N(problem)	25,528	159,055
	Mean(SD)	0.1501(0.3572)	0.1926(0.3572)
	gaming	30632	3832
	non-gaming	128423	21696
	Chi-Square	**$\chi^2(1)$ = 261.1, P-value = 0.00000*** **	
many slots-many cards		Numbertrain#1	Missingnumber#2
	N(problem)	24,591	38,156
	Mean(SD)	0.4075(0.4914)	0.4342(0.4957)
	gaming	16567	10021
	non-gaming	21589	14570
	Chi-Square	**$\chi^2(1)$ = 43.497, P-value = 0.00000*** **	
total		Bugmath, Numbertrain#1,2	Missingnumber#1,2, Feedingtime
	N(problem)	99,132	21,896
	Mean(SD)	0.1685(0.3743)	0.2312(0.4216)
	gaming	50616	16703
	non-gaming	168313	82429
	Chi-Square	**$\chi^2(1)$ = 1607.6, P-value = 0.00000*** **	

DISCUSSION

Because gaming behavior is harmful on academic performance (Aleven et al., 2006), prior studies have sought ways to reduce gaming in educational software. Various UI elements have been proposed to minimize gaming on Intelligent Turning Systems (ITS) (Baker et al., 2008; Walonoski, & Heffernan, 2006), yet gaming in educational games have been less examined. We expect that because both ITS and educational games have similar goals in terms of achieving student learning, effects of UI elements on anti-leaning behavior such as gaming, would be similar as well. Indeed, the results from our study showed how a type of UI, visually salient feedback, is negatively related with gaming behavior in educational games.

Although this study is meaningful in that it empirically validates the relationship between visually salient feedback and gaming behavior, several limitations exist. First, in this study, we only analyzed quantitative data to see the relationship between visually salient feedback and gaming. Quantitative analysis alone makes it difficult to identify factors that we want to measure such as how learners perceive visually salient feedback. Thus, we suggest conducting interviews or observations to collect qualitative data in the future. Second, this study has limitation in that our data is collected from pre-K to grade 2 in elementary school. Since the amount of time for which the learners can concentrate may vary depending on their age (Higgins, & Turnure, 1984; Klenberg et al., 2001), analysis with other age groups is required for a more generalizable result. Finally, although we compared games with similar UI (number of slots-number of cards), gaming schema and identical game levels, we could not completely match game-specific characteristics such as topics or interaction characteristics with the device. Since various factors affect a student's willingness to engage in gaming, it is important to control other factors outside the factor that we wanted to examine. Therefore, we recommend future research to investigate the relationship between salient feedback and gaming in a more controlled setting.

CONCLUSION

Learners can engage in gaming behavior when they feel bored or have a weak motivation to learn. Since boredom and motivation for achievement are related to a low level of attention, we examined whether providing visually salient feedback, which can increase attention, is related to reduced gaming behavior. As hypothesized, we observed less amount of gaming in games with visually salient feedback, which helps learners to pay attention. Specifically, the data analysis result from three game pairs ('1 slot-10 cards', '1 slot-<= 5 cards' and 'many slots-many cards') shows that gaming behavior was less observed in games where visually salient feedback was provided. The study results are meaningful in that it examined gaming behavior through data generated by learners playing educational games freely in classroom situations. Although a correlational relationship was found in our study, to examine a causal relationship, a controlled experiment should be conducted to identify whether visually salient feedback can cause less amount of gaming behavior in future studies.

REFERENCES

Aleven, V., Mclaren, B., Roll, I., & Koedinger, K. (2006). Toward meta-cognitive tutoring: A model of help seeking with a Cognitive Tutor. *International Journal of Artificial Intelligence in Education*, 16(2), 101-128.

Aleven, V., Popescu, O., & Koedinger, K. R. (2001). Towards tutorial dialog to support self-explanation: Adding natural language understanding to a cognitive tutor. *Proceedings of Artificial Intelligence in Education*, 246-255.

Baker, R. S., Corbett, A. T., Koedinger, K. R., & Wagner, A. Z. (2004). Off-task behavior in the cognitive tutor classroom: when students" game the system". *Proceedings of the SIGCHI conference on Human factors in computing systems,* 383-390.

Baker, R. S., Walonoski, J., Heffernan, N., Roll, I., Corbett, A., & Koedinger, K. (2008). Why students engage in "gaming the system" behavior in interactive learning environments. *Journal of Interactive Learning Research*, 19(2), 185-224.

Carrasco, M. (2011). Visual attention: The past 25 years. *Vision Research*, 51(13), 1484-1525.

Cheng, R., & Vassileva, J. (2005). Adaptive Reward Mechanism for Sustainable Online Learning Community. *Proceedings of Artificial Intelligence in Education*, 152-159.

Divjak, B., & Tomić, D. (2011). The impact of game-based learning on the achievement of learning goals and motivation for learning mathematics-literature review. *Journal of Information and Organizational Sciences*, 35(1), 15-30.

Higgins, A. T., & Turnure, J. E. (1984). Distractibility and concentration of attention in children's development. *Child Development*, 5(5), 1799-1810.

Kim, B., Park, H., & Baek, Y. (2009). Not just fun, but serious strategies: Using meta-cognitive strategies in game-based learning. *Computers & Education*, 52(4), 800-810.

Klenberg, L., Korkman, M., & Lahti-Nuuttila, P. (2001). Differential development of attention and executive functions in 3-to 12-year-old Finnish children. *Developmental neuropsychology*, 20(1), 407-428.
Magnussen, R., & Misfeldt, M. (2004). Player transformation of educational multiplayer games. *Proceedings of other players.*
Muldner, K., Burleson, W., Van de Sande, B., & VanLehn, K. (2011). An analysis of students' gaming behaviors in an intelligent tutoring system: Predictors and impacts. *User modeling and user-adapted interaction*, 21, 99-135.
Treue, S. (2003). Visual attention: the where, what, how and why of saliency. *Current Opinion in Neurobiology*, 13(4), 428–432.
Walonoski, J. A., & Heffernan, N. T. (2006). Prevention of off-task gaming behavior in intelligent tutoring systems. *International Conference on Intelligent Tutoring Systems,* 722-724.
West, G. L., Stevens, S. A., Pun, C., & Pratt, J. (2008). Visuospatial experience modulates attentional capture: Evidence from action video game players. *Journal of vision*, 8(16), 1-9.
Wise, S. L. (2017). Rapid-guessing behavior: Its identification, interpretation, and implications. *Educational Measurement: Issues and Practice,* 36(40), 52-61.
Wise, S. L., Pastor, D. A., & Kong, X. J. (2009). Correlates of rapid-guessing behavior in low-stakes testing: Implications for test development and measurement practice. *Applied Measurement in Education*, *22*(2), 185-205.
Wolfe, J. M., & Horowitz, T. S. (2004). What attributes guide the deployment of visual attention and how do they do it?. *Nature reviews neuroscience*, 5(6), 495-501.

The Pattern of Facebook Use among Libyan Students and Teachers in Turkey:

A Case Study

Marwa Ezzidin Grain
Grmarwa789@gmail.com
MA Student
International Christain University
Tokyo, Japan

Facebook has become an essential tool in everyday life. It has made significant contributions to transportation, health, communication, economy, education, and many other industrial fields. Researchers have been exploring Facebook in education in many diverse countries. In spite of their efforts in the last decade, there is still a general lack of interest in using Facebook in education for Libyan schools abroad. There are more than 60 Libyan schools outside Libya. However, research about Facebook in education in the Libyan context has not yet been found. The purpose of this study is to explore Facebook as an educational tool for the transnational Libyan schools and investigate how the teachers and students in these Libyan schools use Facebook for non-educational and educational purposes employing the uses and gratification theory developed by Bulmer and Katz which aims to explain the relationship between an audience and how this audience uses media.

Two case studies were conducted to answer the research questions. First, interviews with teachers and students were conducted. Second, observation of Facebook pages and groups of the two schools was one the instrument to collect data and understand the main ideas of using Facebook in these schools. Third, observation of classroom teaching was one the instrument to collect data and understand the usage of Facebook inside the classrooms.

Findings show that most of the teachers integrated different features of Facebook for non-educational and educational purposes. This integration promoted active learning, which supports the engagement of the students during all the process of teaching and learning inside and outside classrooms. The teachers developed the use of Facebook daily as a primary tool to connect with the students, administers, and parents. For the teachers, Facebook was not considered as a social tool all the time students use it inside classroom.

Through classroom observations, the analyses of the schools' Facebook pages and groups revealed that different features of Facebook pages and groups were utilized for institutional and educational purposes in the Libyan schools in Turkey. Moreover, the interviews with the teachers and students to investigate the various purposes of using Facebook for teaching and learning in Libyan schools revealed that the main purposes of using Facebook from the teachers` and students perspective include 1) information seeking, 2) entertainment, 3) meeting people, 4) discussion 5) maintaining relationships, 6) making school inquiry, 7) announcing social events and 8) checking school services.

Key words: Facebook, Social media, education, Libya, Libyan schools, Turkey.

INTRODUCTION

Recently, the use of social media is rapidly increasing. We all understand the empowering role social media plays in our lives. Anyone online can have access through social media and can access information and knowledge banks. Now, social media such as Facebook plays an essential role in influencing our history, our economy, politics, our education, and our overall view of the world.

Nowadays, people have been using Facebook in various activities. Manasijevic et al. (2016) found that Facebook is commonly used every day by many people from diverse backgrounds and cultures. It is not surprising for Facebook to be a universal networking application all over the world.

Facebook is known as the most popular application all over the world, especially in the Arab countries after 2011.

Facebook played an outstanding role with the Arab Spring from the end of 2010 until 2012. Salem and Mourtada (2011) explained that Facebook became a viral tool for Arabic countries after the end of 2010. Many of the actual demonstrations about the Arab Spring were posted on Facebook. That encouraged many Arabs to create a Facebook account. The impact of Facebook in Libya during 2011 encouraged many Libyan citizens create an account on Facebook to know more news about Libya. Nsir (2014) explained that understanding the use and effectiveness of social media in Libya can lead to the changes Libyans want to see in many sectors, including education. Apparently, after the 2011 Facebook went viral in Libya not only in politics but in education as well.

Facebook in education seems to be accepted in the education system, not only in politics in many countries. Using Facebook in education can help to create stronger links between home and school, with results as an increase in everyday communication and accountability with students and teachers. Most of the public and private Libyan schools in and outside the country have a Facebook page. The schools' administration department are the administrators of the Facebook page. Those Facebook pages are used as a homepage and a tool for communication with stakeholders.

The purpose of this study is to explore Facebook as an educational tool for transnational Libyan schools and investigate how the teachers and students in these Libyan schools use Facebook as a social and educational glue employing a qualitative case study approach.

Technology is well used recently in many countries. It starts to get its place in developing and developed countries as well. The human societies all over the world transformed the usage of technology into a complete dependence. Technology exists in our daily life issues; in communication, business, traveling, learning, economy, and many other industries. Our dependence on technology seems to be rising and thus increased, technology has a big role in education.

Hussain (2007) explained that the Virtual University in Pakistan (VUP) succeed in adopting using television internet tutorial. The VUP surveyed 387 undergraduate students, and the survey results showed that the students found out that using technology and the Internet in the learning process is helpful and useful. Although technology is more used effectively in education in the developed countries.

Also, most of the faculty staff provide their lesson material via the website. In England, Harrison et al (2004) found out that integrating technology with education has significant results.

Nowadays, technology is taking its place in the Arab world little by little, and in countries like Libya, technology is being used more now, especially among the students. One of the open universities in Libya known as Alrefak University uses google classroom in the educational and academic process.

Mobile is one of the technology types that is used to make people's life easier. Mobiles and smartphones were developed from the telephone. The telephone is a Greek word means (sound and far). The purpose of inventing the telephone to make people hear others' sounds from a far distance.

Despite the history of the telephone a long time ago, the telephone no longer exists as it used to be. However, now the telephone becomes a small portable device we call mobile. The significant role of mobile all over the world nowadays makes it impossible not to use mobile in everyday life. It is considering that access to many things is at our hands in everyday life. The use of mobile in pedagogy seems quite useful. Nowadays, many are starting to rely on mobile for educational purposes.

Mobile was introduced in Libya in 2000. According to the International Telecommunication Union [ITU] (2012), usage of mobile phones increased rapidly from 1% in 2001 to 171% in 2010, showing multiple subscriptions per person. Many Libyan educators and researchers started to realize the huge impact of the mobile phone on learning. Most of those educators used the mobile in many tasks during their study period at the university. That inspired them to create and develop software on mobile to help students in the learning process.

At the beginning of 2018, at the third Libya Startups EXPO. A new startup company is known as Gantsu Sensei, founded by Marwa Grain. The company aimed to redesign the school textbooks into enjoyable and exciting ways for the students to make them enjoy the learning process. The company aimed to make a mobile application and upload the animated school textbooks in it.

At the beginning of 2019, at the fourth Libya Startups EXPO. Another startup company is known as istudy, founded by Zakaria Gwaila. The company designed software for android and IOS mobile users. The software aims to make a connection between teachers, students, and parents. Students can log in to the application using their ID, and their parents can log in to the application using their ID. Parents can check the absence, grades of their children in all subjects without any need to visit the school and talk to the teachers.

After 2011, Libyans start relying on the mobile phone as a tool for education and learning. Facebook is known as one of the most used mobile applications in education. Facebook has many tools that can be used in learning effectively, like Moodle. Facebook is a free application. It is one of the applications used in many educational institutions in Libya to help students access information.

Facebook mobile application made the learning process in Libya effective and remarkable. In Libya, where mobile learning is counted as one of the essential success factors in building the new Libya, mobile learning technology could offer a much more convenient and affordable option to the Libyan educational institutions (Rhema, & Miliszewska, 2012).

Facebook has many tools that can be used in education effectively, like Moodle. However, many developing countries use Facebook because Facebook is a free application. It is one of the applications used by many countries in education to help students access information.

Up-to-date education in Libya has many obstacles, including a lack of educational resources, teachers' attitude, lack of secure environment, and students' low motivation. Facebook has played an important role to help education overcome some of those obstacles. Millions of school textbooks were burned and destroyed in the Ministry of Education buildings during the fighting in Tripoli in 2019 (Elumami, & Amara 2019). However, a Facebook page called Libyan initiatives for e-learning helped to provide the teachers and the students with the textbooks by uploading the textbooks as a PDF on their Facebook page.

Facebook is being used for education by many Libyan educational institutions not only in Libya but in many Libyan educational institutions outside Libya as well. According to the Ministry of Education in Libya there are 43 Libyan schools abroad following the Libyan system and curriculums.

Libyan schools outside Libya already existed before the 2000 in few countries such as UK, Malaysia and Turkey. During that time there were less than ten Libyan schools abroad. Due to the huge population of Libyan people in these countries. These schools were funded and established in these countries. According to the MOE in Libya, now there are forty-three Libyan schools abroad using the same Libyan curriculum, and those schools are approved and certified by the Libyan MOE. However, each school might have to adopt different policies than the other schools, depending on the host countries' policy.

These Libyan schools are for Libyan students who live abroad. Most Libyan prefer to enroll their children to Libyan schools in nearby countries like Tunisia, Algeria, and Turkey. Apart from their proximity, these countries are also chosen by Libyans due to similarities in language, religion, and culture. These schools are provided with good materials for students to learn in the twenty-first century.

Most of the Libyan schools abroad have a Facebook page and group, each school has a different way to integrate using Facebook in an educational setting different from the other one. Moreover, each school might have more than one Facebook private group.

RESEARCH DESIGN & METHODS

To answer the above research questions, two Libyan schools in Turkey were selected to conduct this study with a qualitative method approach for three weeks starting from the beginning of December 2019. Three main categories of participants were involved; the first category is the high schools' teachers, the second category is the high schools' students.

Three main instruments were utilized in this study:

1. Observation of Facebook pages and groups of the two schools was one the instrument to collect data and understand the main ideas of using Facebook in these schools.

2. Observation of classroom teaching was one the instrument to collect data and understand the usage of Facebook inside the classrooms.

3. Structured and semi-structured interviews with teachers were conducted to high school teachers and students to collect additional supplementary data to understand teacher's experiences and student's reflections on their learning to confirm and support the observation data.

RESULTS

Findings show that most of the teachers integrate different features of Facebook for academic and educational purposes. This integration promotes active learning, which supports the engagement of the student during all the process of teaching and learning in and outside classrooms.

The teachers developed the use of Facebook daily as it is the primary resource for teachers to connect with the students, administers, and parents. For teachers, Facebook was not considered as a social tool all the time students use it in class.

Findings show that most of the teachers integrated different features of Facebook for social and educational purposes. This integration promoted active learning, which supports the engagement of the students during all the process of teaching and learning in and outside classrooms. The teachers developed the use of Facebook daily as a primary tool to connect with the students, administers, and parents. For the teachers, Facebook was not considered as a social tool all the time students use it in class.

Through classroom observations, the analyses of the schools' Facebook pages and groups, and interviews with the teachers and students to investigate the various purposes of using Facebook in Libyan schools, the study found that different features of Facebook pages and groups were utilized for the educational purposes in teaching and learning in the Libyan schools in Turkey. Moreover, the study revealed that the main purposes of using Facebook from the teachers` and students perspective include 1) information seeking, 2) entertainment, 3) meeting people, 4) discussion 5) maintaining relationships, 6) making school inquiry, 7) announcing social events and 8) checking school services

REFERENCES

Manasijevic, D., Zivkovic, D., Arsi, S. & Milosevic, I. (2016). Computers in human behaviour exploring students' purposes of usage and educational usage of Facebook. *Computers in human behavior 60*,441–450. Retrieved from: https://doi.org/10.1016/j.chb.2016.02.087

Salem, F. & Mourtada, R. (2011). Civil movements: the impact of Facebook and Twitter. *Arab social media report,1*(2). Retrieved from: http://unpan1.un.org/intradoc/groups/public/documents/dsg/unpan050860.pdf

Nsir, N. (2014). The perceptions of social media in Libya. Retrieved from https://search-proquest-com.othmer1.icu.ac.jp:2443/docview/1660972391?accountid=10105

Harrison, C., Lunzer, E. A., Tymmsw, P., Carol Taylor, F.-G., & Restorick, J. (2004). Use of ICT and its relationship with performance in examinations: A comparison of the ImpaCT2 project's research findings using pupil-level, school-level and multilevel modeling data. *Computer-Assisted Learning, 20*(5), 319-337

Rhema, A. And Miliszewska, I. (2010). Towards e-learning in higher education in Libya. *Informing science and information, l7*,423-437. Retrieved from: http://iisit.org/Vol7/IISITv7p423-437Rhema735.pdf

Developing cultural intelligence (CQ) in blended environments: Understanding and assessing experiential learning methods

Peter W. Roux
peteroux@cc.saga-u.ac.jp
Associate Professor
Saga University
Saga, Japan

Ryuchi Matsuba
matsuba@kumamoto-u.ac.jp
Professor
Kumamoto University
Kumamoto, Japan

Katsuaki Suzuki
ksuzuki@kumamoto-u.ac.jp
Professor
Kumamoto University
Kumamoto, Japan

Yoshiko Goda
ygoda@kumamoto-u.ac.jp
Professor
Kumamoto University
Kumamoto, Japan

As educational technologies continue to expand in scope and depth, their application in traditional and blended learning environments pose a challenge to long-standing educational practices. One such approach, experience-based learning (EBL), has long been a favorite of educationists in a broad range of disciplines. Since the EBL method has been so closely and enduringly associated with other learning theories, it seems relevant to consider its role and relevance in a blended environment, since advances in the application of modern learning technologies is bound to have a profound impact on this more traditional educational approach. The current study aims to explore the role of EBL in a blended, in-class environment where it was applied to support the development of intercultural competence (ICC) in Japanese undergraduates. Given our project's larger concern with developing a comprehensive pedagogy for the cultivation of cultural intelligence (CQ) in higher education, we specifically wish to address the potential value of EBL in blended environments by giving attention to issues such as assessing EBL and its role and impact on CQ learning and -skill development. To assist our understanding of EBL's promise in this regard, we present data concerning the efficacy and impact of EBL activities from earlier stages of our project. Analysis of the data is then used to further problematize the question of CQ learning gains and how these could/should be obtained and analysed to demonstrate CQ development. We conclude that the role of EBL in developing CQ holds strong application potential for blended environments but requires a thorough understanding of its purpose and scope; and to achieve this, a proper assessment of EBL's impact on learning and skill development is necessary.

Key words: instructional design; cultural intelligence; experiential learning; blended learning; Japanese higher education

INTRODUCTION

Globalization has increased the cultural diversity that exists within both domestic and multinational organisations. This multicultural reality in work and academic environments is likely to increase even further in virtual worlds as online learning, teleworking and business exchange expand by means of the Internet (Fischer, 2011; Roux & Suzuki, 2017). Governments worldwide have long relied on colleges and universities to prepare the future workforce. In recent years it has been further recognized that a sufficiently capable, and internationally mobile workforce needs more than mere academic preparation to succeed and thrive in a globalized world. As a result, higher education institutions are increasingly involved in helping students to develop a set of adjacent soft-skills alongside the required academic and professional qualifications that they are likely to need, regardless of their chosen career path (Sit, Mak & Neill, 2017; Suharti, Handoko & Huruta, 2019). Human resource development research has recognized that people with a 'global mindset' often adapt to and engage more successfully with work environments characterized by high levels of diversity (Kedia & Mukherji, 1999; Roux, 2018). Similar research in the field of intercultural competence has highlighted the personal abilities that encapsulates the skills necessary to work in culturally diverse situations (Ang, Van Dyne & Tan, 2011; Leung, Ang & Tan, 2014). Recent developments in this area have suggested the notion of cultural intelligence (CQ) to denote the set of intercultural competencies that characterize a person who can adapt and work in diverse environments with ease and efficiency (Livermore, 2011; Ang, Van Dyne & Rockstuhl, 2012).

The current study forms part of a larger project that is concerned with the development of a comprehensive pedagogy for the cultivation of CQ in higher education (Roux & Suzuki, 2017; Roux, Suzuki, Matsuba & Goda,

2018; 2019a; 2019b; 2020). The project brings together the fields of instructional design and educational technology (ID&T) with developments in the areas of human resource training and CQ learning in Japanese higher education (Roux & Suzuki, 2017). Building on a unique framework that sought to synthesize well-known methods and models from these mentioned disciplines (Roux & Suzuki, 2017), the project expanded to a full-fledged blended (BL) university course to cultivate CQ in Japanese undergraduates (Roux et al., 2018; 2019a; 2019b).

Research in these overlapping areas suggest that experience-based learning (EBL) is often a preferred method of learning, if not fundamental to the development of intercultural competence (Leung et al., 2014). Given the fast-developing progress of educational technologies however, traditional educational methods (such as EBL), have received renewed scrutiny and instructors have come under increased pressure to adapt (Alonso, López, Manrique & Viñes, 2005, 2008; Roux, Suzuki, Matsuba & Goda, 2020; Kirste & Holtbrügge, 2019). The current paper presents another attempt at assessing the contribution of EBL to CQ learning design, by essentially posing two interrelated questions: (1) what is the relevance and role of EBL in CQ learning and development; and (2) how can this role of EBL be effectively assessed to demonstrate its effectiveness in blended environments?

Earlier research findings

EBL has long been a favored approach in designing learning interventions in the fields of education, training and development, and also intercultural skill development (Leung et al., 2014; Andresen, Boud & Cohen, 1995). Despite being widely utilized in educational contexts, little research has been done to explore EBL's potential in blended environments (Barnes, Smith & Hernández-Pozas, 2017; Roux et al., 2019; 2020; Kirste & Holtbrügge, 2019). Earlier efforts in the current project highlighted the role of experience-based learning (EBL) in a blended environment as a valuable element in the development of CQ. Findings indicated that although the use of EBL as a learning approach in a blended context likely combined to develop CQ, it was far less clear exactly *how* this was achieved (Roux et al., 2020). The role of EBL in CQ education is assumedly complex and the although the rationale for its use appear to be clear and not lacking validity, the means for assessing its use and efficacy remains to be thoroughly investigated (Roux et al., 2020; Gosen & Washbush, 2004). The integrative framework which formed the foundation of our investigation is reproduced in figure 1.

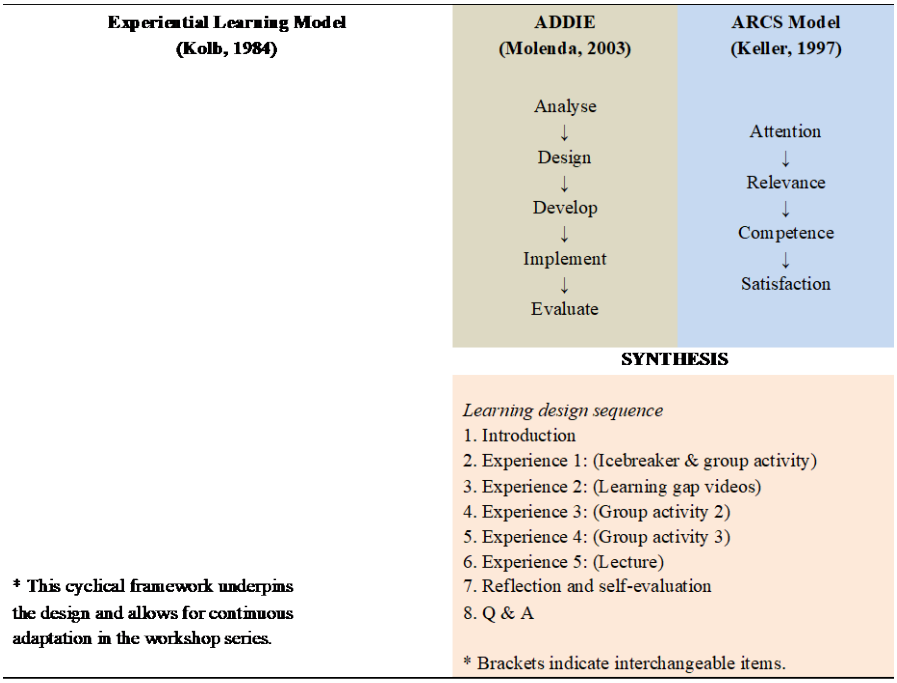


Figure 1. A model for integrating EBL, instructional design thinking and cultural learning

As outlined in earlier research work (Roux & Suzuki, 2017), the EBL model (Kolb, 1984) informed our basic design thinking and subsequent methodology. EBL has proven success ratings in intercultural training and learning and demonstrated effectiveness in CQ training and research (Barnes, Smith & Hernández-Pozas, 2017; MacNab, et al., 2012; Ng, Van Dyne & Ang, 2009). As a pedagogical approach in higher education, it has garnered support for its ability to help develop intercultural awareness and effectiveness in students (Barnes et al., 2017; Fischer, 2011; MacNab et al., 2012). In our model (figure 2), placing EBL alongside the chosen ID models (ADDIE & ARCS) allows their individual components to be

utilized in the development of CQ. Preceding studies utilizing this framework indicated that weaving these 3 models together enabled a design and implementation process (a blended course) that positively impacted CQ learning for undergraduates at a Japanese university (Roux et al., 2018; 2019a; 2019b).

While this framework successfully incorporated EBL with ID, much of the detailed application work needs to be disentangled in order to understand EBL's contribution to CQ in blended environments. In line with our purpose here, it was reasoned that obtaining these insights would throw light on assessing the role, value and assessment of EBL's unique contribution to CQ learning. In this regard, EBL has been described as a method with the capacity to transform experience into learning (Kolb, 1984). Our current effort therefore attempts to address the potential value of EBL in blended environments by giving attention to more detailed issues such as how to understand and assess the precise role and efficacy of EBL in CQ learning. To explicate this more closely in view of our current purpose, figure 2 below (adjusted from Roux & Suzuki, 2017) highlights the cultural learning content in relation to the relevant learning steps in the EBL model.

ADDIE Model		**ARCS Model**	**LEARNING CONTENT** *Cultural content & Intercultural competence training content*	Time	**Experiential Learning Model**
Setting, Description & Tasks		*Descriptors*	*Detail of learning contents*		*Description*
Analyze learning contents & audience	*Align goals & learning contents*	**Attention**	1 Outline of learning contents	**10**	
Design how it is to be learnt	*Mixed methods*		2 Experience 1: Ice breaker – EBL Discussion & self-reflection	**10**	**Frame & Initiate**
Develop learning materials	*Provided: Videos & Hand-outs*	**Relevance**	3 Experience 2: EBL – Discussion	**20**	
Implement in a real-world context	*Facilitate workshop*	**Confidence**	4 Experience 3: EBL – Discussion	**5**	
			5 Experience 4: EBL – Discussion	**10**	**Imagine & Experience**
			6 Lecture	**20**	
Evaluate adequacy of learning	*Evaluation of learning contents*	**Satisfaction**	7 Self-evaluation & workshop evaluation / Q & A	**10**	**Reflect, analyse & re-apply**

Figure 2. Detailed outline of the intercultural course/workshop learning design to show EBL activities

This breakdown formed the basic design thinking embedded in our approach to an initial multicultural workshop geared toward CQ learning and were expanded into a semester-long blended course (Roux et al., 2018; 2019a). Although earlier findings indicated that the course was successful in elevating CQ developments, other findings pointed to the necessity for further refinements and description of instructional procedures (Roux et al., 2019a). Moreover, while the various ways for assessing learning outcomes provided insights into different elements of the blended CQ course, the specific impact of EBL and the associated use of online support were not sufficiently descriptive in terms that would show the contribution of EBL (Roux et al., 2020). The general thrust of the shortcomings therefore indicate the need for a more sophisticated approach to assess the role of EBL; this would in turn give insights to the '*how'* of CQ learning and its underlying pedagogical support.

RESEARCH DESIGN & METHODS

In line with the current purpose, which is to reconsider and assess EBL's unique contribution to CQ learning, we focus attention on: (1) learning reflection surveys, (2) class reviews (comprising formative assessments of the content and instruction) and (3) a set of questions that formed part of a learning reflection checklist. Table 1 provides a detailed breakdown of the instructional modalities, the learning assessment elements and the questions that were identified as potentially indicative of EBL's postulated impact on learning. Four

different groups are presented. Groups 1 and 2 participated in a multi-cultural workshop for CQ learning and were asked to provide feedback on their learning preferences. Groups 3 and 4 participated in a 15-week semester blended course aimed toward CQ development. We acknowledge that it is not possible to compare the groups; instead, we aimed to emphasize their responses on the learning feedback as a means to investigate the impact of EBL. To assist the analysis, we include previously published data (group 1) (Roux & Suzuki, 2017) and add similar contrastive data (group 2) to expand the opportunities for analysis and understanding. Slight adjustments to surveys/learning assessments are noted where applicable. The ensuing discussion aims to further problematize the question of EBL gains and how these could/should be obtained and analysed to understand CQ learning.

Table 1. Key instructional modalities/forms for a learning impact analysis of EBL

Instructional modality	Learning assessment elements	Learning statements for research purposes
Cultural learning workshop 1 (Roux & Suzuki, 2017) Group 1 (2017) (N = 47)	1. Learning statements	1. I learn best by myself, quietly reading or studying. 2. I learn best in a small group, studying and talking. 3. I learn best when a teacher talks and explains in a lecture. 4. I learn best when I can use technology (PC, smart device) to write, watch and do research.
	2. Five EBL-based instructional elements: Activity & group-based discussion	*EBL-based workshop elements* 1. Cultural symbols drawing 2. 'Group areas act' 3. Learning gap / Interactive quizzes 4. Lecture 5. Multi-cultural groups
Cultural learning workshop 2 Group 2 (2018) (N = 40)	1. Learning statements	Learning statements 1-4 as above. 5. I enjoy interacting with people from different cultures. * *Added for Workshop 2*
	2. Five EBL-based instructional elements: Activity & group-based discussion	*EBL-based workshop elements* 1. Cultural symbols drawing 2. 'Group areas act' 3. Learning gap / Interactive quizzes 4. Lecture 5. Multi-cultural groups
Blended course 1 Group 3 (2018) (N = 27) ---------- Blended course 2 Group 4 (2019) (N = 33)	Learning reflection checklist	1. Activities in a group or with a partner are useful for learning. 2. Working online using a smartphone or PC is useful for learning. 3. Reading a textbook and answering questions is useful for learning. 4. Listening to a lecture by the teacher is useful for learning. 5. Watching a video or short movie clip about a topic is useful for learning. 6. Participating in an online exchange with foreign students is useful for learning. 7. Having a class where there are different ways of learning is interesting and useful.

RESULTS

Results from cultural learning workshop 1 (group 1)

As highlighted in table 2, the marked areas of *somewhat agree* and *agree* displays increased agreement for questions 2, 3 and 4, as observed pre/post workshop 1. Notably, these 3 questions all relate to an interactive element (whether with classmates, the instructor, or a learning tool). Although this is not a significant finding in itself, the impact of the short workshop on the learning statements is nevertheless noticeable and shows that participants react positively if there is something/someone to engage with in a blended situation.

Table 2. Learning statements pre- & post workshop 1 (group 1)

Workshop 1	*Disagree*		*Somewhat disagree*		*Neutral*		*Somewhat agree*		*Agree*	
Learning statement	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
1. I learn best by myself, quietly reading or studying	0	4.3	10.6	8.5	36.2	34	27.7	27.7	25.5	25.5
2. I learn best in a small group, studying and talking.	6.4	2.1	8.5	4.3	27.7	25.5	40.4	46.8	17	21.3
3. I learn best when a teacher talks and explains in a lecture.	2.1	0	10.6	10.6	34	17	46.8	59.6	6.4	12.8
4. I learn best when I can use technology (PC, smart device) to write, watch and search for answers.	0	0	27.7	19.1	29.8	29.8	23.4	29.8	19.1	21.3

Results from cultural learning workshop 2 (group 2)

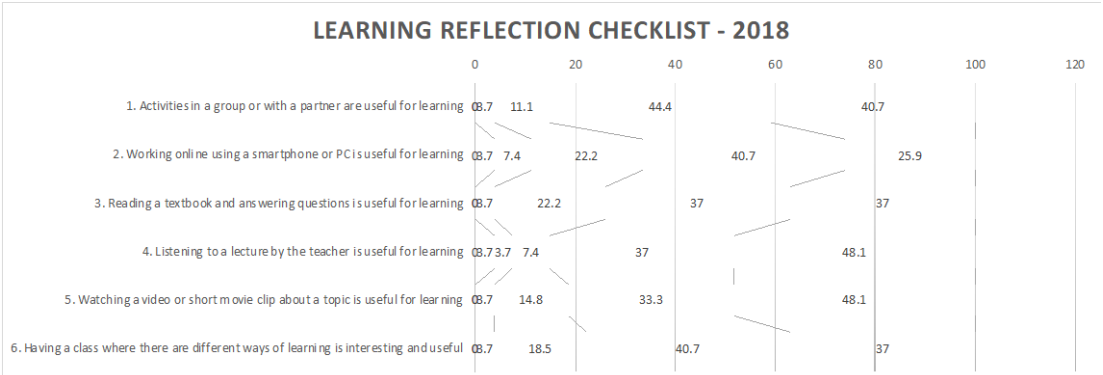
Likewise, table 3 reflect similar shifts in the learning statements as observed in workshop 1. However, there is also a shift in statement 1 for this group, possibly indicating that these participants prefer this style. For this workshop, a fifth question was added to consider the combination of instructional choices, which seemed a very popular consideration among participants and thus indicated that instructional variety could be a key ingredient during a workshop. In retrospect, workshop 2 was less interactive and occurred in a lecture hall, whereas workshop 1 was more interactive, groups were pre-organized around tables facing each other. These choices may explain the lesser shift in questions 2-4 and the different result in observed when question 1 is compared.

Table 3. Learning statements pre- & post workshop 2 (group 2)

Workshop 2	*Disagree*		*Somewhat disagree*		*Neutral*		*Somewhat agree*		*Agree*	
Learning statement	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
1. I learn best by myself, quietly reading or studying	0	0	7.5	10	42.5	25	50	60	0	5
2. I learn best in a small group, studying and talking.	0	0	12.5	10	22.5	15	55	55	10	20
3. I learn best when a teacher talks and explains in a lecture.	0	0	5	0	30	25	55	52.5	10	22.5
4. I learn best when I can use technology (PC, smart device) to write, watch and search for answers.	2.5	0	37.5	20	35	45	22.5	27.5	2.5	7.5
5. I learn best when I can follow a combination of the previous ways (1-4).	2.5	0	0	0	35	25	17.5	27.5	45	47.5

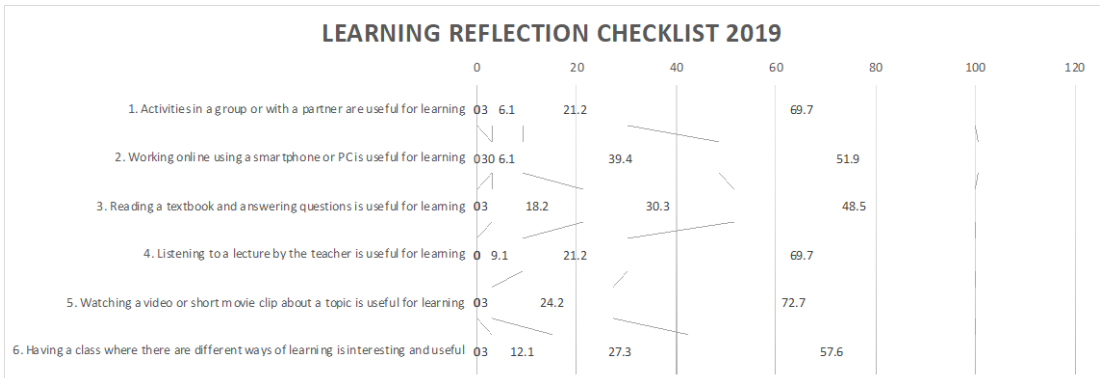
Results from the blended course: Learning feedback checklist (groups 3 & 4)

As stated earlier, a 15-week blended course to cultivate CQ was designed, keeping in mind our original framework and the original workshop as outflow. To consolidate this course, a learning reflection checklist was designed with an eye to the self-assessment of learning gains and the impact of the mode of instruction. As outlined in table 1, six broad questions related to learning were recorded on a 6-point Likert scale and are analysed here to form an idea of the usefulness of the participants experienced. As is observable from both checklists (figures 3 & 4), the clear majority of responses fall in the (5-6 *definitely useful*) range. Comparing the different modes of instruction across the 2 checklists shows even further increases in the learning preferences for the second checklist. Of note in both learning checklists are elevated preferences for questions 1 (group activities), 4 (lectures), 5 (audio-visual) and 6 (instructional variety). For the 2nd group, these preferences are even further elevated.



	6. Having a class where there are different ways of learning is interesting and useful	5. Watching a video or short movie clip about a topic is useful for learning	4. Listening to a lecture by the teacher is useful for learning	3. Reading a textbook and answering questions is useful for learning	2. Working online using a smartphone or PC is useful for learning	1. Activities in a group or with a partner are useful for learning
1 not at all	0	0	0	0	0	0
2	0	0	3.7	0	3.7	0
3	3.7	3.7	3.7	3.7	7.4	3.7
4	18.5	14.8	7.4	22.2	22.2	11.1
5	40.7	33.3	37	37	40.7	44.4
6 definitely	37	48.1	48.1	37	25.9	40.7

Figure 3. Group 3 – Results from a learning reflection checklist



	6. Having a class where there are different ways of learning is interesting and useful	5. Watching a video or short movie clip about a topic is useful for learning	4. Listening to a lecture by the teacher is useful for learning	3. Reading a textbook and answering questions is useful for learning	2. Working online using a smartphone or PC is useful for learning	1. Activities in a group or with a partner are useful for learning
1 not at all	0	0	0	0	0	0
2	0	0	0	0	3	0
3	3	0	0	3	0	3
4	12.1	3	9.1	18.2	6.1	6.1
5	27.3	24.2	21.2	30.3	39.4	21.2
6 definitely	57.6	72.7	69.7	48.5	51.9	69.7

Figure 4. Group 4 – Results from a learning reflection checklist

FINDINGS & DISCUSSION

The current paper represents a further attempt at assessing EBL's contribution to CQ learning design, by essentially posing two interrelated questions: (1) what is the relevance and role of EBL in CQ learning and development; and (2) how can this role of EBL be effectively assessed to demonstrate its effectiveness in blended environments? These questions were explored by means of analysing the participant feedback during two intercultural learning workshops and two learning reflection checklists following two semester-long blended courses to develop CQ. Findings from the two workshops highlight that participants favoured instructional variety and group-based learning activities, which is reiterated in similar findings from the blended courses. Participants also reported preferences for receiving lectures by the instructor, engagement with audio-visual materials and an increasing preference for doing online work using PCs/smart devices. Previous research ventures in this project (Roux & Suzuki, 2017; Roux et al., 2018, 2019a, 2019b, 2020) linked CQ learning to similar analyses and found support that CQ development was achieved through the instructional design and methods. It remains difficult to isolate the direct impact of EBL's exact contribution to the CQ learning process, however.

These findings lend some justification to the reported design and methodology. While positive – given the fairly recent growth of learning in blended environments – the findings are hardly surprising when considering that they merely support the established consensus regarding 'active learning': participants like to be engaged and achieve better results when they are actively occupied and can use various learning tools comfortably during learning. The findings thus appear to confirm the consensus that individual learning – which is at the centre of EBL – remains difficult to assess and measure effectively (Gosen & Washbush, 2004). In terms of EBL, the individual learning response is mostly measured through self-assessment and this aspect might well have to be explored in a more individualized and qualitative manner. Future work will need to explore this contention by delving deeper into the individualized understandings of CQ learning and development.

CONCLUSION

The current study aimed to explore the role of EBL in a blended, face-to-face environment where it was applied to support the development of intercultural competence (ICC) in Japanese undergraduates. Given our project's larger concern with developing a comprehensive pedagogy for the cultivation of cultural intelligence (CQ) in higher education, we specifically addressed the potential value of EBL in blended environments by giving attention to issues such as assessing EBL and its role and impact on CQ learning and -skill development. To assist our understanding of EBL's promise in this regard, we presented data concerning the efficacy and impact of EBL activities from two workshops and two blended courses in our project. This analysis was used to problematize the question of CQ learning and how it could/should be obtained to demonstrate CQ development. We conclude that the role of EBL in developing CQ holds strong potential for blended environments but requires a thorough understanding of its purpose and scope; and to achieve this, a proper assessment of EBL's impact on learning and development is necessary. Findings point toward the necessity for building more individualized understandings of intercultural learning if an appropriate EBL pedagogy is to be developed for CQ growth.

REFERENCES

Alonso, F., López, G., Manrique, D., & Viñes, J. M. (2005). An instructional model for web-based e-learning education with a blended learning process approach. *British Journal of Educational Technology, 36*(2), 217–235.

Alonso, F., López, G., Manrique, D., & Viñes, J. M. (2008). Learning objects, learning objectives and learning design. *Innovations in Education and Teaching International*, *45(4)*, 389–400.

Andresen, L., Boud, D. & Cohen, R. (1995). Experience-based learning: Contemporary issues. In: G. Foley (Ed.) *Understanding Adult Education and Training*, (Second Edition) (pp. 225–239). Sydney: Allen & Unwin.

Ang, S., Van Dyne, L, & Rockstuhl, T. (2012). Cultural intelligence: Origins, conceptualization, evolution, and methodological diversity. In M. J. Gelfand, C. Chiu, & Y. Hong, (Eds.) *Handbook of Advances in Culture and Psychology* (pp. 273–322). Oxford: Oxford University Press.

Ang, S., Van Dyne, L., & Tan, M. L. (2011). Cultural intelligence. In R. Sternberg & S. B. Kaufman (Eds.), *The Cambridge Handbook on Intelligence*, (pp. 582–602). Cambridge: Cambridge University Press.

Barnes, K. J., Smith, G. E., & Hernández-Pozas, O. (2017). What's Your CQ? A framework to assess and develop individual student cultural intelligence. *Organization Management Journal, 14*(1), 34–44.

Eisenberg, J., Lee, H., Brück, F., Brenner, B., Claes, M., Mironski, J. & Bell, R. (2013). Can business schools make students culturally competent? Effects of cross-cultural management courses on cultural intelligence. *Academy of Management Learning & Education, 12*(4), 603–621.

Fischer, R. (2011). Cross-cultural training effects on cultural essentialism beliefs and cultural intelligence. *International Journal of Intercultural Relations, 35*(6), 767–775.

Gosen, J., & Washbush, J. (2004). A review of scholarship on assessing experiential learning effectiveness. *Simulation & Gaming, 35*(2), 270–293.

Kedia, B. L., & Mukherji, A. (1999). Global managers: Developing a mindset for global competitiveness, *Journal of World Business, 34(3)*, 230–251.

Keller, J. M. (1997). Motivational design and multimedia: Beyond the novelty effect. *Strategic Human Resource Development Review, 1*(1), 188–203.

Kirste, L., & Holtbrügge, D. (2019). Experiential learning in the digital context: An experimental study of online cultural intelligence training. *Journal of Teaching in International Business*, *30*(2), 147–174.

Kolb, D.A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.

Leung, K., Ang, S., & Tan, M.L. (2014). Intercultural competence. *Annual Review of Organizational Psychology and Organizational Behavior 1*(1), 489–519.

Livermore, D. (2011). *The Cultural intelligence difference special e-book edition: Master the one skill you can't do without in today's global economy.* New York: AMACOM.

Macnab, B., Brislin, R. & Worthley, R. (2012). Experiential cultural intelligence development: context and individual attributes. *The International Journal of Human Resource Management, 23*(7), 1320–1341.

Macnab, B., Brislin, R. & Worthley, R. (2012). An experiential approach to cultural intelligence education. *Journal of Management Education 36*(1), 66–94.

Roux, P.W., Suzuki, K., Matsuba, R. & Goda, Y. (2020) (forthcoming). Developing cultural intelligence (CQ) through experiential learning: Considering relevance and rationale in blended environments. *The Journal of Information and Systems in Education 19*(1).

Roux, P.W., Suzuki, K., Matsuba, R. & Goda, Y. (2019a). Examining the self-perceived development of cultural intelligence (CQ) in a blended learning environment. *The Journal of Information and Systems in Education 18*(1) 69–76.

Roux, P.W., Suzuki, K., Matsuba, R. & Goda, Y. (2019b). Designing instruction to develop cultural intelligence (CQ): Reporting on blended learning outcomes at a Japanese university. *International Journal for Educational Media and Technology, 13*(1), 27–34.

Roux, P.W. (2018). Developing a global mindset: Designs for blended learning. *Journal of the Organization for General Education, 6,* 146–156. Saga University, Japan.

Roux, P.W., Suzuki, K., Matsuba, R. & Goda, Y. (2018). Developing cultural intelligence (CQ): Designs for blended learning. *International Journal for Educational Media and Technology, 12*(1), 18–28.

Roux, P.W., & Suzuki, K. (2017). Designing online instruction for developing cultural intelligence (CQ): A report from a classroom-based workshop. *International Journal for Educational Media and Technology, 11*(1), 87–96.

Sit, A., Mak, A. S., & Neill, J. T. (2017). Does cross-cultural training in tertiary education enhance cross-cultural adjustment? A systematic review. *International Journal of Intercultural Relations*, *57*, 1–18.

Suharti, L., Handoko, Y., & Huruta, A. (2019). Linking cultural intelligence and adaptive performance: do intercultural interactions and Host University Support™ play important roles? *Business, Management and Education*, *17*, 36–48.

Thomas, M., Mitchell, M., & Joseph, R. (2002). The third dimension of ADDIE: A cultural embrace. *TechTrends, 46*(2), 40–45.

Moving from Crisis Distance Education to Optimal Online Learning

Michael P. Menchaca
mikepm@hawaii.edu
Professor and Chair
University of Hawaii at Manoa
Honolulu, Hawaii

Amber S. Makaiau
amakaiau@hawaii.edu
Associate Specialist
University of Hawaii at Manoa
Honolulu, Hawaii

Erin Nakano
nakanoer@hawaii.edu
English and Technology Teacher
Hawaii Department of Education
Honolulu, Hawaii

Ngan-Ha Ta
tanganha@hawaii.edu
Upper School Chinese Teacher
'Iolani School
Honolulu, Hawaii

In response to the pandemic crisis that required emergency online teaching in which teaching institutions had to deliver instruction with little planning, a summer think tank was designed to assist school-site teams in long range planning for distance delivery. Through facilitation, collaboration, and feedback, expertise was provided for school-site planning. The program focused on the following areas: (a) a structured reflection on each group's recent crisis online instruction experience; (b) a review of research, models, and policy recommendations for technology integration and distance learning; (c) training and practice with model-based technology tools supporting online learning and communication; (d) communicating to parents; and (e) developing mission aligned, progressive distance learning plans supported by a comprehensive planning template and group collaboration. To support planning, a template was provided and its completion facilitated by the program team. This paper describes the design and creation of the think tank program.

Keywords: Distance Education, Program Planning, Progressive Education, Best Practices

INTRODUCTION

The pandemic crisis required fast and nimble application of distance education with no time to plan. Teaching institutions did their best with the tools, strategies, and knowledge at hand making a significant difference at a crucial and challenging time. It is time now to take a step back, reflect on successes and challenges, and begin long term planning harnessing the energy and lessons learned from the crisis together with appropriate models and best practices for online learning. This paper describes the design of

a summer think-tank program where teachers and administrators collaborated with teacher education and learning design and technology experts to develop long term distance education plans aligned to the vision goals and mission objectives of their respective institutions. Plans emphasized place-based learning, local and global diversity, and best practices to design mission-aligned progressive education for the 21st century. This paper is limited to describing the design of the program and, pending appropriate IRB approval, future research will include presenter and participant experiences, data from participant evaluations, and presenter and participant voice from recorded sessions and shared documents.

DESIGN

Toward the end of Spring 2020, after experiencing the crisis of teaching during the pandemic and not fully prepared for an online format, leaders from diverse educational institutions approached the Department of Learning Design and Technology at the University of Hawaii at Manoa seeking professional development expertise in teaching online. Expertise was sought both internally and from outside organizations. A particular collaboration with Hanahau'oli School, a progressive education JK-6 school in Honolulu, led to the idea of organizing a summer think tank providing school groups a research-based yet practical approach to designing mission aligned, progressive distance learning programs for their schools.

The think tank was designed to be delivered online over three weeks—two days in week 1, one in week 2, and one in week 3—to allow time for reflection, collaboration, and practice. Teams from 10 schools participated with a total of 48 attendees. Teams included 5 private schools from Northern and Southern California, 1 private school from Hawaii, and 4 teams from the Department of Education in Hawaii. The program was facilitated by four professional educators, also the authors of this paper. The program focused on the following areas:

- A structured reflection on each group's recent crisis online instruction experience;
- A review of research, models, and policy recommendations for technology integration and distance learning;
- Training and practice with model-based technology tools supporting online learning and communication;
- Communicating to parents; and
- Developing mission aligned, progressive distance learning plans supported by a comprehensive planning template and group collaboration.

Reflection

For structured reflections, participants were asked to consider and discuss the following prompt:

Considering your recent experience providing instruction on a crisis basis, what was one thing that you felt worked and one thing you would have changed?

Other reflection prompts included: (a) having each team identify one progressive and/or innovative distance learning practice that they implemented well and were proud of, (b) identifying one current problem of practice that they were struggling with or thinking deeply about, and (c) identifying one assessment practice embedded in their school's distance learning plan. Participants shared their reflections on these prompts.

In addition to sharing reflections, presenters presented participants with real-world case studies based on their own experiences. These included one public school experience, two private school experiences, and the perspective of K-12 students from an online article (Ferlazzo, 2020). The case study technique was important in getting participants to understand that their struggles were not uncommon and moreover were better understood when shared.

Research, Models, and Policy in Distance Education

Participants were provided an overview of current research, models, and policy in the field of distance education to provide foundational knowledge in developing distance plans. Research and models included: (a) design considerations for creating a sense of community (Menchaca, 1997; Cowan & Menchaca, 2014); (b) the Greek concept of *Xenia* where the host appropriately provides for the guest (Xenia, n.d.); (c) providing a simplified, contemporary model for organizing delivery into Content, Asynchronous delivery, Synchronous delivery, and Assessment (Menchaca, 2006); and (d) understanding the Community of Inquiry Model which focuses on Cognitive, Social, and Teaching Presences (Garrison, Anderson, & Archer, 2010).

Participants also reviewed the importance of place-based education where local places serve as learning ecosystems wherein students can better understand their place in their community and not only how they impact that community but more importantly how they might improve it (Schneider, 2016). Overall, federal policy including the 2017 National Education Technology Plan Update (U.S. Department of Education, 2017) as well as the proposed redefinition of distance education to encourage innovation (U.S. Department of Education, 2020) served as guides to envisioning empowered learning through distance education.

Training and Practice with Technology Tools

Participants were provided training on best-practice, technology tools supporting optimal distance delivery. Tools covered included learning management systems, virtual tours, conferencing software, presentation software, video creation and distribution, computer-supported collaboration, infographics, word cloud generators, royalty-free images and videos, website creators, web-based resources, book and comic book creators, and quiz and self-assessment applications. Tool training was always qualified with

best-practices strategies for content creation as well as asynchronous and synchronous delivery including but not limited to polling, breakout rooms, virtual potlucks, guest speakers, show and tell, story-telling, peer collaboration, and working with distinct age groups from Pre-K to High School.

In order to ensure appropriate integration, participants were not only provided tool training and strategies, but were also provided time to try tools and ask questions during *Sandbox* time. Sandbox time is merely a strategy allowing participants to test drive new tools with access to expertise as needed. During the workshop, participants could self-select breakout rooms where different tools were offered for both training and application.

Communicating with Parents

In addition to training and practicing with tools, attendees were presented with contemporary research on working with parents, especially in considering the reality of being only online. Participants were introduced to the idea that parents, caregivers, guardians, or other persons in a household who assume responsibility for *managing* and *guiding* children through their learning curriculum and tasks become *learning coaches* (Hasler-Waters, Borup, & Menchaca, 2017; Hasler-Waters & Leong, 2014). Parents as learning coaches become guides, tutors, learners who share their own personal experiences, motivators, managers, and even disciplinarians. Teachers and administrators need to better understand the experiences of parents in distance settings and collaborate with them, understanding that they benefit from clarity, direction, and guidance.

In distance settings at this point in time, both teachers and parents must acknowledge there was never an assumption that teachers would teach solely online, or that parents would expect children to be home every day, or that students would not be able to socialize regularly. They must assume the best of each other and know there will be struggles and stressors. Teachers can help by explaining what parents can expect, what schedules will look like, what can realistically be supported and when, where they can go if they need more help, and how contact will be supported and maintained.

Parents often are not fully aware of their own impact in the learning environment so teachers must let them know. Teachers should focus on encouraging, reinforcing, modeling, and assisting as needed. Even more important, teachers should not be responsible for everything, especially technical and access issues, so an appropriate system must be identified where parents can go to for assistance. Overall, starting the school year with an orientation-type meeting with all families can help establish norms and routines.

Developing Mission-Aligned, Progressive Distance Learning Plans

The most important goal of the think tank was of course to facilitate school-site teams in developing robust distance learning plans. This was accomplished through facilitation, collaboration, modeling, feedback, and the use of the design template (see Appendix). The overall guiding question for

the Think Tank was: How do we ensure that our distance learning plan is progressive and aligns with the mission / vision of our school? In ensuring progressive alignment, some tenets of progressive education as defined by Kohn (2008) were provided:

- **Attending to the Whole Child:** helping children become not only good learners but also good people, attend to the social, emotional, and intellectual needs of children
- **Community:** people learn from one another in caring democratic communities
- **Collaboration:** emphasis on collaborative problem solving
- **Social Justice:** opportunities are offered not only to learn about, but also to put into action, a commitment to diversity and to improving the lives of others
- **Intrinsic Motivation:** "What's the effect on students' interest in learning, their desire to continue reading, thinking, and questioning?"
- **Deep Understanding:** organize learning around problems, projects, and questions — rather than around lists of facts, skills, and separate discipline
- **Active Learning:** the school is learner centered and students engage in constructing ideas
- **Taking Kids Seriously:** teachers are scientists who study children and society, take cues from children and design learning alongside them, both as individuals and as a group.

In addition to the guiding hand of progressive education, a major factor in supporting distance planning was the planning template. The template was divided into the following categories:

- **Background and context** to consider context, demographics, available tools and infrastructure, access issues, expectations, guiding research, and skills assessment;
- **Guiding frameworks and structures** to consider mission, vision, beliefs, learning outcomes, and curriculum;
- **Technology policies** to consider both existing policies and their impact on curriculum;
- **Program overview** to consider choice technology desired, appropriate pedagogical tools, available delivery strategies, routines, assessment, record keeping systems, virtual entry points such as a landing or home page, and rationale;
- **Grade level / specialist differentiation** to consider best practices, delivery strategies, and choice technology for specific populations;
- **Roles and responsibilities** to identify appropriate role alignment within the organization; and
- **Communications** to understand the different roles and needs of teachers, families, parents as learning coaches, and administrators.

It is important to note that the template was not necessarily created to be completely filled out but instead as a guide for each school team where they could determine the most important sections to address.

CONCLUDING THOUGHTS

The goal of the workshop was not specifically to have each school team complete the planning template category by category but instead to provide a holistic overview of appropriate design considerations taking stock of their own progress and identifying their own priorities. Through facilitation and collaboration each school team was provided the opportunity to plan for the realistic probability of online delivery without having to further operate in crisis mode. This paper was limited solely to describing the design of the program and, pending appropriate IRB approval, future research will include presenter and participant experiences, data from participant evaluations, as well as presenter and participant voice from recorded sessions and shared documents

REFERENCES

Cowan, J., & Menchaca, M. (2014). Investigating value creation in a community of practice with social network analysis in a hybrid online graduate education program. *Distance Education 35*(1), 43-74.

Ferlazzo, L. (2020, May 6). Students reflect on their distance learning experiences. *Education Week.* https://blogs.edweek.org/teachers/classroom_qa_with_larry_ferlazzo/2020/05/students_reflect_on_their_distance_learning_experiences.html

Garrison, R., Anderson, T., & Archer, W. (2010). The first decade of the community of inquiry framework: A retrospective. *The Internet and Higher Education 12*(1-2), 5-9.

Hasler-Waters, L, Borup, J., & Menchaca, M. (2017). Update on parental involvement in K-12 online and blended learning. In Ferdig, R., and Kennedy, K. (Eds.), *Handbook of research on K-12 online and blended learning 2017 edition* (pp. 403-422). Hershey, PA: IGI Publishing.

Hasler-Waters, L. & Leong, P. (2014). Who is teaching? New roles for teachers and parents in cyber charter schools. *Journal of Technology and Teacher Education 22*(1), 33-56.

Kohn, A. (2008). Progressive education: Why it's hard to beat, but also hard to find. *Independent Schools.* https://www.alfiekohn.org/article/progressive-education

Menchaca, M. (1997). If you build it, will they come? Issues of equity in online instruction. *Proceedings of the TCC Conference*. ERIC Digest.

Menchaca, M. (2006). Optimizing distributed learning delivery models: An asset class approach to distance learning. In A. Burge (Ed.), *Proceedings of Hawaii International Conference on Education 2006* (pp. 4501-4507). Honolulu, HI: HICE.

Schneider, C. (presenter). (2016, November 28). *Getting smart podcast: Experiencing place-based education at Teton Science Schools.* [Podcast]. https://www.gettingsmart.com/2016/11/getting-smart-podcast-experiencing-place-based-education-teton-science-schools/

U.S. Department of Education. (2017). Reimaging the role of technology in education: 2017 national education technology plan update. Office of Educational Technology, Washington, D.C.

U.S. Department of Education (2020). Distance education and innovation. Office of Postsecondary Education, Washington, D.C.

Xenia. (n.d.) In *Wikipedia.* https://en.wikipedia.org/wiki/Xenia_(Greek)

APPENDIX: PLANNING TEMPLATE

SCHOOL'S BACKGROUND AND CONTEXT

School Context/Demographics:

Summary of Spring 2020 Crisis Distance Learning Program:

Taking Stock--Available Technological Tools, Infrastructure, and Support:

Issues of Access:

Institutional Distance Learning Program Expectations/Requirements:

Technology Skill Assessment (e.g. administration, teachers, students, families, etc.):

Key Models/Frameworks/Research Guiding the School's Distance Learning Program:

GUIDING FRAMEWORKS AND STRUCTURES

Mission:

Vision:

Beliefs:

Schoolwide Learning Outcomes:

School Structures & Curriculum (e.g. grade level classes, specialists, interdisciplinary, advisory):

TECHNOLOGY POLICIES

Link to School Technology Policies:

Impact of School Technology Policies on Curricular and Pedagogical Decision-Making (e.g. student gmail accounts as lines of school-home communication, meeting tool impact on small group work, etc.)

OUR DISTANCE LEARNING PROGRAM OVERVIEW

Choice Technology (e.g. WebEx, Seesaw, G-Suite, Canvas, Zoom, etc.)

- Learning Management Systems (e.g. Google Classroom)

- Content Management Systems (e.g. Readworks, Khan Academy, ExtraMath, etc.)
- Pedagogical Tools (e.g. Flipgrid, Padlet, Edmoto, etc.)

Delivery Strategy (e.g. synchronous, asynchronous, hybrid):

Schoolwide Schedule/Routines (i.e. what everyone does):

Assessment (e.g. formative and summative):

Record Keeping (e.g. attendance):

School's Distance Learning Program Landing Page (i.e. entry point into the program with key information and links):

Rationale: How do the choices above link to the school's mission and vision?

OUR GRADE LEVEL/SPECIALIST DISTANCE LEARNING PROGRAM BREAKDOWN

Grade Range 1 (Identify and repeat as needed for different grade ranges)

- Best Practices Summary
- Choice Technology
- Delivery Strategy
- Schedule/Routines (i.e. what sub-groups do)
- Assessment (e.g. formative and summative)
- Modifications for Special Education/Multi-Language Learners (e.g. UDL)
- Rationale: How do the choices above link to the school's mission and vision?

ROLES AND RESPONSIBILITIES

Alignment of Distance Learning Program with School Staff/Personnel:

COMMUNICATIONS

Alignment of Communication Presence (e.g. teacher to families, families to teachers, teachers to students, students to teachers, students to students, etc.) to Tools (e.g. email, Google classroom, live meetings, etc.):

Directions for "Learning Coaches" (i.e. adults supporting kids at home) (e.g. creating a dedicated learning space, materials needed, level of support needed, practices, tips, strategies, etc.):

Capacity-Building for Technology Literacy Skills: Inquiry on University Students' Characteristics, Behaviors, and Perceptions

Danilo M. Baylen
dbaylen@westga.edu
Professor
University of West Georgia
Carrollton, Georgia USA

Merle Lorca-Junsay
mljunsay@cpu.edu.ph
Professor
Central Philippine University
Iloilo City, Philippines

This descriptive study explored the technology used in completing specific tasks by students from the first batch graduating from the new K-12 curriculum in the Philippines. The respondents included 571 students from a private university reporting their perceived level of skills in the use of technology as well as the type and extended use of technology in completing specific tasks. Findings revealed that the respondents identified themselves as above average or heavy technology users. Moreover, the students' perception of the type of user they are did not vary according to gender and location. However, 19-year old students classified themselves as heavier users than other age groups. As to the type of gadget used, smartphones were the everyday technology that the students used to complete most of the tasks. At the same time, respondents utilized laptops in completing limited but essential tasks like entering data into spreadsheets, designing, and doing presentations. Noticeably, students did not commonly use desktop computers. Checking finances in banks, creating podcasts, or paying bills online were not considered as big tasks.

Keywords: K-12 education, Philippines, technology literacy skills, technology use

INTRODUCTION

The knowledge of increasing access, availability, and use of technology across different Filipino society sectors is critical for educators and policymakers. The information gathered could help define efforts and direct strategies that support curriculum development, faculty preparation, and resource allocation, to name a few. Having a baseline in identifying students' technology literacy skills would guide policy development impacting 21st-century skills development. The researchers argued for the need to collect data about technology literacy skills from graduates of the new basic education program known as K-12. Philippine education transformed from a 10-year pre-university cycle into a K-12 program under the Republic Act No. 10533 series 2012 signed on May 15, 2015. The new curriculum ensured that graduating from the K-12 program would provide "the standard knowledge, skills, and competencies needed to go to college" (Acosta & Acosta, 2016, p. 2452). Proponents of the K-12 program argued that the time spent in senior high school would allow students not only to develop a specialization in addition to the acquired skills and competencies (Sarmiento & Orale, 2016). Further, Acosta and Acosta (2016) stated that the new curriculum would "produce holistically developed citizens equipped with 21st-century skills essential for both life-long learning and employment" (p. 2452). The first batch of K-12 graduates entering as university students began in 2018.

Education Reform and Literacy Development. The education reform argued that K-12 graduates would be college-ready and equipped with skills to succeed in the 21st-century workplace. One of the essential 21st-century skills focuses on developing literacy skills such as information, media, and

technology that promotes digital comprehension and supports completion of tasks at home, school, or workplace (Batelle for Kids, 2019). Stauffer (2020) described these literacies as understanding facts, figures, statistics, data, publishing, and tools and applications supporting activities in the information age.

The push for literacy development in technology promises positive outcomes for the Philippine government's education reform efforts. This inquiry explored the background and experiences of students who completed senior high school attending a local university in the Philippines' Western Visayas region. The researchers were interested in the students' frequency of using technology to complete tasks involving social, academic, or business transactions (Baylen & Arellano, 2018) and the extent of technology literacy skills they could demonstrate while attending college as K-12 graduates.

Technology in the Philippines. Technology devices as tools supporting the completion of various tasks have become pervasive in people's living and work situations. For many young people, the use of technology seems essential in conducting daily activities and in meeting personal, academic, social, and work-related needs. Further, the Philippine government supported the implementation of projects that promoted technology use and integration in the schools. For example, the iSchools Project in Camarines Sur Province made significant contributions toward integrating ICT into public high schools (Foronda, 2011). Similar project implementation in Tarlac Province contributed to bridging the digital divide by developing an educational digital network. The project equipped teachers with ICT literacy skills and provided access to relevant digital content and applications to make learning effective (Lorenzo, 2016).

Technology Use. Online blogs and pages and research articles abound on how Filipinos use technology in different contexts (Carbonilla Gorra & Bhati, 2016; Gonzales, 2019; Stauffer, 2020). Research on students' use of technology reported activities involving "instant messaging through chatting, lesson inquiry about assignments, sending and receiving emails, research through surfing the net including data gathering by downloading files and sharing cultural experiences with others through [the] internet" (Carbonilla Gorra & Bhati, 2016, p.102). Further, Gonzales (2019) reported that the social media usage "soared from 9 hours and 29 minutes last year to 10 hours and 2 minutes this year, the highest in the world" (para 4). Reports from these sources indicate Filipinos spending more time online than the citizens of neighboring Asian countries.

Reyes (2017) reported the growth of using mobile devices in both personal and professional activities. Reyes cited Jason Miller, the chief strategist of commerce of Akamai Technologies, stating, "sixty-nine percent of the Web traffic is generated by mobile devices, which offers proof that mobile is the primary device of most Filipinos" (para 4). However, the Pew Research Center reported that there are "still notable numbers of people in emerging economies who do not own a mobile phone, or who share one with others" (Rainie & Silver, 2019, p.3). The report also identified that mobile phone ownership was only limited to approximately 30 percent among Filipino adults. Furthermore, data collected on technology devices used as well as students' perceptions of technology use in completing tasks would be invaluable. For example, curriculum developers would have a working knowledge of the type of technology literacy skills needed for each level of educational experience in rapidly evolving learning environments.

RESEARCH DESIGN & METHODS

The researchers present this writing as a descriptive study that utilized survey design. The study participants were the first batch of graduates of the K-12 curriculum who attended a local university as first-year students.

Context. The study respondents came from one of the local universities in Iloilo City, located in Iloilo province in Western Visayas in the Philippines. The university is a non-stock, non-profit institution that enrolls over 12,000 students in its primary and secondary education, undergraduate, graduate, and professional programs. The majority of the students come from the three major islands of Region 6. The researchers chose the first-year students from the local university as respondents, given its open admission, large senior high school population, and reputation for quality higher education programs.

Data Collection. The researchers collected data using an online survey delivered through *Qualtrics* application. The online survey questionnaire was self-created, and the survey items were developed based on the analysis of the related literature and other secondary data sources (An & Reigeluth, 2011; Andrade, 2012; McLaren, 2019; UNESCO, 2013). The survey items included questions on demographic information (gender, age, residence location, user type, etc.), perceived frequency of using technology, and technology devices used in completing tasks. The link to the online survey was made available to educators and librarians in contact with the study's target population. Consent to participate in the study

was included in the survey's introductory narrative explaining its purpose and goals. Before potential participants could access the online survey, they needed to provide permission by responding to the first question after the introduction. Target participants choosing not to consent received feedback thanking them for participation and then logged out them immediately from the online survey.

Online Survey. After the study participants provided consent, the *Qualtrics* application provided access to the online survey containing thirty-two statements referring to various tasks and then several questions collecting demographic information. Participants completed first a sentence that read, "I use technology to" and followed by a statement about a specific task (e.g., listen to music). In completing the statement, the participant needed to choose one of the answer options: *None at all*, *Sometimes*, *Most Times*, and *All the time*. Second, the participants responded to the next question asking for the technology device used to complete the task identified in the previous statement. The choices included a SMART phone, tablet/iPad, laptop, or desktop computer. Also, participants could choose *Not Applicable* if they had no experience completing the task, as mentioned earlier, or did not use a technology device.

Demographic information. The online survey also collected demographic information as considerations in the study and identified K-12 graduates' characteristics as study participants. In writing up the report, the researchers chose to include and discuss four elements: *User Type*, *Gender*, *Age* (2018 as the base year), and *Location of Residence*. The data for *User Type* came from participants' responses to the perceived frequency of technology use each day. Choices included *Beginner* (10% or less), *Average* (less than 50%, greater than 10%), *Above Average* (less than 100%, greater than 50%), and *Heavy* user (100%).

Gender, Age, and Location of Residence. The research literature discussed gender as a factor influencing the acquisition of technology literacy skills (Bray, 2007; Cai, Fan & Du, 2017). The participants provided their birth years for age, and the researchers determined the participants' age using 2018 as the base year. The researchers grouped the sample's age range into 18-, 19-, and 20-24 years old. Further, participants reported city or rural as their location of residence. The research literature discussed place as a factor in providing exposure and experiences related to technology literacy (Anderson, 2015; Wang, 2013).

Data Analysis. Data gathered were analyzed with descriptive statistical techniques using the Statistical Package for the Social Sciences (SPSS) software. Researchers utilized frequencies to describe the perceived user type of participants by age, location, gender, their extended use of technology, and the kind of technology they used to complete specific tasks.

Limitations. The study was exploratory and descriptive in using a survey approach, to establish determinants that characterize a sample of a target population, i.e., K-12 graduates attending as first-year university students located in the Western Visayas region of the Philippines. Given the study's scope and outcome, the researchers know that there would be limitations, such as time and funding constraints. The researchers collected data from a small population of first-year students at one local university, which might not represent the target student population of higher education institutions in the region (Western Visayas) and the country (Philippines).

As a descriptive study, the researchers could only examine texts and narratives from the participants' self-reports and observed frequency and patterns from the survey responses collected. Reports from the data analysis only provided a snapshot of potential factors or determinants of using technology to complete the tasks. With these constraints, the ability to generalize this study's findings could not be extended beyond the participants.

RESULTS

The initial research questions focus on developing a description based on the demographic data, self-reports of technology devices used, and perceptions of technology use:

1. What type of technology users are the students as they perceived themselves according to gender, age, and location?
2. What technology devices did the students use in completing specific tasks?
3. What are the students' perceptions of their extended use of technology in completing specific tasks?

Participants' Characteristics. Researchers selected three demographic information (gender, age, and location of residence) to describe the study participants of K-12 graduates and first-year university students. Researchers received more than 900 survey forms, but 571 with valid responses were considered for analysis (see Table 1). The sample came from the completed surveys of 478 female (83.7%), and 93

male (16.3%) participants. For the age distribution, the researchers received valid survey responses from the following groups: 135 surveys from 18-year old (23.6%), 386 from 19-year old (67.6%), and 50 from 20-24-year old (8.8%). Finally, the residence location generated 304 for the city (53.2), while 267 selected rural (46.8%).

Perceived User Type. The survey asked participants on the frequency of technology use in completing specific tasks (see Table 1) as identified by user types. Participants as users of technology had four choices based on the perceived rate of technology use: *Beginner* (10% or less), *Average* (more than 10% but less than 50%), *Above Average* (50% or more but less than 90%, and *Heavy* (100% or All the time). None of the participants perceived themselves as *Beginners*, but 10.7% identified themselves as *Average* users. *Above Average* users were nearly half (46.6%) and led the groups in frequency count followed closely by 244 *Heavy* users (42.7%).

Gender and User Type. Are there more heavy users among females in comparison to male participants? Table 1 provides the breakdown of user types by gender. Percentage-wise, there seems to be no variation as to the kind of users the students were (*Average*, *Above Average*, and *Heavy*) given female and male participant.

Age and User Type. In considering age, the researchers found that within each group, the 19-year old reported themselves as *Heavy* users (44.8%) compared to other user types (38.5% and 38%). However, both participants, as 18-year old (51.1%) and 20-24-year old (54%) users, posted high percentages as the *Above Average* user type.

Location of Residence and User Type. Are city residents more heavy users of technology than those in rural areas? More city residents in the group see themselves as above average and heavy users.

Table 1. Frequency of User Type as Perceived by Survey Participants by Gender, Age, and Location

	Sample		**GENDER**		**AGE**			**LOCATION**	
	Distribution		Female	Male	18	19	20-24	City	Rural
USER TYPE	*f*	%	%	%	%	%	%	%	%
Beginner	---	---	---	---	---	---	---	---	---
Average User	61	10.7	10.5	11.8	10.4	11.1	8.0	10.5	10.9
Above Average User	266	46.6	46.7	46.2	51.1	44.0	54.0	46.7	46.2
Heavy User	244	42.7	42.9	41.9	38.5	44.8	38.0	42.9	41.9
Total	571	100.0							

Task and Technology Device Used. The researchers asked the survey participants on the technology devices they used in completing the tasks (see Table 2). In the survey, the participants could choose one of the four technology devices identified by the researchers: *Desktop* (value=1), *Laptop* (value=2), *Tablet/iPad* (value=3), and *SMART phone* (value=4). Anticipating that some participants might not have the experience of completing one of the identified tasks or using technology to complete a task, the researchers included a fifth option, *Not applicable* (value = 0).

Using 50% and above as an indicator of pervasiveness in using a specific technology device, the researchers identified patterns of responses based on frequency count within groups for *SMART Phone*:

- Eighteen tasks received 50% or more responses for using a SMART phone from the survey participants.
- The task of *calling friends and family* (97.5%) received the highest count for using a SMART phone, followed by *texting friends and family* (96.8%). *Chatting with family and friends* (96.0%) came in third, followed by *listening to music* (95.4%) and *taking pictures or digital images* (95.4%).
- Three tasks received 50% or more responses for using a laptop from the survey participants. The job of *putting together an electronic presentation* (e.g., using PowerPoint) received the highest response (78.1%). Other tasks receiving a high response that met the cut off criteria included *designing and creating brochures, flyers, or posters* (55%) and *entering data into a spreadsheet* (52.9%).
- The desktop and tablet/iPad as technology devices use to complete the tasks did not receive 50% or more responses from the survey participants. Percentage-wise, the highest answer reported was 15.6% for desktop computers, and 3.3% for tablet/iPad.

Discussion on Technology Devices Used. SMART phones and laptops seem to be the technology devices that university students use in completing tasks identified in this study. For tasks receiving 50% or more responses of using SMART phones, a large number of survey participants (mean of 91.5%) reported using SMART phones to communicate with others (#4, 5, 23, 28). Also, about 85% reported

using the same technology device for entertainment (#9, 16, 21, 24, 27) while about 80% used it to complete academic-related tasks (#1, 7, 8, 17, 20, 29, 31). Further, some survey participants reported using laptops (62%) in completing academic-related tasks (#14, 15, 22). The researchers found these findings consistent with the literature about access to technology devices in Asia, especially in the Philippines (Librero, Ramos, Ranga, Triñona, & Lambert, 2007; Valk, Rashid, & Elder, 2010).

Table 2. Frequency of Task by Technology Device Used (N = 571)

Task (N = 571)	NA **%**	Desktop **%**	Laptop **%**	Tablet/ iPad **%**	SMART Phone **%**
1. access online databases and research articles.	0.2	4.0	15.4	2.1	78.3
2. build web pages and websites.	35.2	10.5	21.2	0.5	32.6
3. buy or sell items online.	26.6	1.9	3.2	2.1	66.2
4. call friends and family.	0.0	0.2	0.7	1.6	97.5
5. chat with family and friends.	0.0	0.4	1.6	2.1	96.0
6. check or monitor my finances or bank account.	57.4	1.9	5.6	0.7	34.3
7. complete an online form.	3.2	9.1	20.1	2.1	65.5
8. compute or solve math-related problems.	9.3	2.5	7.5	1.4	79.3
9. create a digital story.	37.1	2.8	12.8	2.6	44.7
10. create an online profile (e.g., Facebook).	1.2	3.2	9.6	2.3	83.7
11. create a podcast.	65.3	2.3	3.3	2.3	26.8
12. create digital images (e.g., using Photoshop.	12.4	8.2	27.5	2.1	49.7
13. create multimedia files (e.g., videos or movies).	6.8	7.9	35.0	3.2	47.1
14. design and create brochures, flyers, or posters.	13.3	15.6	55.0	2.5	13.7
15. enter data into a spreadsheet.	18.4	13.3	52.9	1.8	13.7
16. listen to music.	0.2	0.4	1.9	2.1	95.4
17. look up words using online reference tools.	1.1	2.5	8.2	2.5	85.8
18. make a reservation for a place to stay (e.g., hotel).	37.8	2.1	5.8	1.9	52.4
19. pay bills online.	65.5	1.6	1.9	0.5	30.5
20. search for information on the web.	0.2	4.4	8.2	2.6	84.6
21. play an online game.	9.5	10.0	9.1	2.6	68.8
22. put together an electronic presentation (e.g., PowerPoint).	1.9	8.2	78.1	1.8	10.0
23. send and receive email from friends and family.	1.2	4.7	15.8	2.6	75.7
24. store digital images.	1.2	2.8	14.3	2.3	79.2
25. submit an application for school or job.	15.9	11.4	34.9	2.1	35.7
26. take or complete an online course.	49.9	6.7	17.2	0.9	25.4
27. take pictures or digital images.	1.2	0.5	0.9	1.9	95.4
28. text friends and family.	0.9	0.2	0.4	1.8	96.8
29. translate texts from one language to another	5.3	3.0	8.1	2.1	81.6
30. view images of places for a vacation.	3.7	3.3	5.3	2.8	84.9
31. watch videos online (e.g., YouTube).	0.2	3.0	5.8	3.3	87.7
32. word process papers and assignments.	1.2	6.7	44.3	1.9	45.9

Task and Perceived Frequency of Technology Use. The survey presented thirty-two tasks that use technology for completion to the participants (see Table 3). Users had three choices to respond when asked for their perception of how frequently they use technology in achieving a specific task: *All the time* (value=4), *Most times* (value=3), and *Sometimes* (value=2). Also, users had a fourth choice, which stated *None at all* (value=1) if they had not used any technology, or had no experience completing the identified task.

Using 50% and above as an indicator of pervasiveness in using technology, the researchers identified patterns of responses (*All the time*) based on frequency count within the group:

- Eight tasks received 50% or more response (*All the time*) from the sample.
- The task of *chatting with family and friends* (78.3%) received the highest count for responses (*All the time*), followed by *listening to music* (77.4%). The task of *texting friends and family* (75.2%) came in third, followed by *watching videos online* (72.9%).
- Other tasks that received a response (*All the time*) include *taking pictures or digital images* (69.9%), *searching for information from the web* (66.9%), *storing digital photos* (60.9%), and *calling friends and family* (59.5%).

- No other tasks received 50% or more response (*Most times* or *Sometimes*). However, using 40% to 49% as an indicator of the frequency of technology use, the researchers identified the following tasks for a response (*Most times*): *building web pages and websites* (45.2%) and *putting together an electronic presentation* (40.1%).

For a response (*Sometimes*), the researchers identified seven tasks receiving between 40 and 50 percent: *Buy or sell items online* (48.9%); *Design and create brochures, flyers, or posters* (47.5%); *Enter data into a spreadsheet* (44.5%); *Submit an application for school or job* (44.3%); *Compute or solve math-related problems* (41.9%); *Create multimedia files* (e.g., videos or movies) (41.5%); and *Complete an online form* (41.3%)

Finally, when researchers reviewed for the frequency of responses (*None at all*), they identified four tasks that received 50% or more from the sample that included *creating a podcast* (68.1%), *paying bills online* (66.4%), *checking or monitor my finances or bank account* (55.2%), and *taking or completing an online course* (50.8%).

Table 3. Frequency of Task by Perceived Use of Technology

Task (N = 571)	*None at all* **%**	*Sometimes* **%**	*Most times* **%**	*All the time* **%**
1. access online databases and research articles.	0.2	9.1	45.2	45.5
2. build web pages and websites.	37.7	35.9	18.4	8.1
3. buy or sell items online.	28.2	48.9	13.5	9.5
4. call friends and family.	0.0	8.9	31.5	59.5
5. chat with family and friends.	0.2	2.5	19.1	78.3
6. check or monitor my finances or bank account.	55.2	29.4	10.5	4.9
7. complete an online form.	3.2	41.3	33.6	21.9
8. compute or solve math-related problems.	7.7	41.9	32.4	18.0
9. create a digital story.	38.2	34.2	17.2	10.5
10. create an online profile (e.g., Facebook).	1.6	19.4	32.0	46.0
11. create a podcast.	68.1	22.9	7.0	1.9
12. create digital images (e.g., using Photoshop.	12.4	42.4	25.4	19.8
13. create multimedia files (e.g., videos or movies).	7.4	41.5	30.6	20.5
14. design and create brochures, flyers, or posters.	14.0	47.5	24.2	14.4
15. enter data into a spreadsheet.	18.7	44.5	22.9	13.8
16. listen to music.	0.0	2.1	20.5	77.4
17. look up words using online reference tools.	1.4	13.5	39.1	46.1
18. make a reservation for a place to stay (e.g., hotel).	38.2	35.9	16.1	9.8
19. pay bills online.	66.4	22.1	6.7	4.9
20. search for information on the web.	0.4	4.7	28.0	66.9
21. play an online game.	9.8	31.5	24.2	34.5
22. put together an electronic presentation (e.g., PowerPoint).	1.9	17.5	40.1	40.5
23. send and receive email from friends and family.	1.2	26.4	32.6	39.8
24. store digital images.	1.2	11.4	26.4	60.9
25. submit an application for school or job.	15.6	44.3	25.0	15.1
26. take or complete an online course.	50.8	22.1	15.4	11.7
27. take pictures or digital images.	1.1	8.1	21.0	69.9
28. text friends and family.	0.5	4.9	18.9	75.7
29. translate texts from one language to another	5.3	38.5	26.3	29.9
30. view images of places for a vacation.	3.7	24.2	27.1	45.0
31. watch videos online (e.g., YouTube).	0.2	4.9	22.1	72.9
32. word process papers and assignments.	0.7	17.7	39.8	41.9

Discussion on the Perceived Frequency of Technology Use. The researchers found patterns from the responses that raised questions, if not speculations on previous experiences of using technology by the study participants. First, trends noted a grouping of responses (*All the time*) into two categories: tasks involving a form of communication (#4, 5, 28), and entertainment (#16, 24, 27, 31). Using technology for communication and entertainment seems consistent with reports about Filipinos' amount of time on social media (Gonzales, 2019). The researchers considered the task of searching for information on the web (#20) as not fitting to either category, which led to the identification of a new one called academic work.

Second, responses (*Most times* or *Sometimes*) identified several tasks (a total of 10) identified as

mostly related to academic work (#1, 7, 8, 13, 14, 15, 22). The findings seemed aligned with the research literature related to the use and integration of information and communication technologies in the Philippines (Carbonilla Gorra, & Bhati, 2016; Foronda, 2011). Several challenges identified from past research studies on technology use included hardware failure, internet connectivity, limited or non-existent technology training (Jin, & Junio-Sabio, 2018; Lorenzo, 2016). Two tasks related to business transactions (#3, 25) received a response (*Sometimes*). Overall, participants seemed to have limited experiences in conducting a business transaction. Researchers speculated that age as a demographic factor could be involved. Further, several business transactions require the use of credit cards that this age group might not have access to.

Third, study participants seemed to indicate that they have limited (less than 10% of the time) or no experience completing a task with or without technology. Three of these tasks involved conducting business transactions (#6, 19, 26) while the researchers categorized creating a podcast (#11) as a form of academic work or entertainment.

Given the patterns of responses observed after data analysis (*Not applicable*, *Sometimes*, and *Most times*), the researchers suggested that K-12 program experiences promoting technology use in support of academic work might be needed. If higher education programs expect students to exhibit technology literacy as university students, they need to start learning and using technology during senior high school, if not earlier.

Finally, the expectation of using technology also requires practice for students to do it well in different contexts, especially in the conduct of business transactions. As more businesses, including government entities, use technology to conduct business (e.g., buy or sell, pay for bills, apply for jobs or licenses, etc.), students as young adults would be expected to perform these functions. In reflection, the researchers speculated that some factors might be limiting (or hindering) K-12 graduates from having experiences with these tasks before attending the university.

CONCLUSION

The K-12 program became a reality due to the need to get Filipinos ready and competitive for the 21st-century workplace. The education reform added content knowledge to the current basic curriculum and pushed for the teaching of technology literacy.

In creating multiple snapshots of K-12 graduates' technology use in different aspects of their lives, the researchers could eventually produce a "big" picture for the area, region, and country. The idea of a "big" picture could provide a map for educators and policymakers in developing new and relevant curriculum at each level from primary, secondary, senior high school, and college. The "big" picture could also provide both the Department of Education and the Commission on Higher Education with a focus on creating support infrastructures for educational institutions under their supervision, including training and resource allocation.

The researchers recommend further inquiry into the interaction of the demographic factors with students' technology devices' choices and opinions on technology use. Are there significant relationships between elements, tasks, and perceptions? The outcomes of the descriptive study encourage researchers to continue collecting data from diverse groups of participants. A study comparing different age groups, including older adults, could provide insights into the diffusion of technology from a historical perspective. Also, the expansion of the data collection to other locations such as the neighboring island or region could inform stakeholders on the accessibility and availability of technology devices and the proliferation of technology literacy practices.

Finally, the researchers encourage further studies focusing on how people acquire technology literacy skills? Where do they learn? How do they learn? Are educational institutions the only place where one can become technology literate? The researchers believe that the formation of a "big" picture could happen by adding more snapshots. Future studies focusing on the acquisition of technology literacy skills in the Philippines could help transition from K-12 to higher education.

REFERENCES

Acosta, I. C., & Acosta, A. S. (2016). Teachers' perceptions on senior high school readiness of higher education institutions in the Philippine. *Universal Journal of Educational Research, 4*(10), 2447-2462. DOI: 10.13189/ujer.2016.041024

An, Y-J., & Reigeluth, C. M. (2011). Creating technology-enhanced, learner-centered classrooms: K-12 teachers' beliefs, perceptions, barriers, and support needs. *Journal of Digital Learning in Teacher Education, 28*(2), 54-62.

Anderson, M. (2015). *Technology device ownership: 2015*. Pew Research Center. Retrieved from http://www.pewinternet.org/2015/10/29/technology-device-ownership-2015

Andrade, D. (2012 January10). 10 tech skills every student should have. *Teaching & Learning*. https://www.techlearning.com/david-andrade/3750

Battelle for Kids. (2019). *Framework for 21st century learning definitions*. http://static.battelleforkids.org/documents/p21/P21_Framework_DefinitionsBFK.pdf

Baylen, D. M., & Arellano, E. (2018). Technology-based experiences of young people: Opportunities for Filipino educators. *TCC Refereed Proceedings, 2018*(1). https://tccpapers.coe.hawaii.edu/archive/2018/Baylen.pdf

Bray, F. (2007). Gender and technology. *Annual Review of Anthropology, 36*, 37-53. DOI: 10.1146/annurev.anthro.36.081406.094328

Cai, Z., Fan, X., & Du, J. (2017). Gender and attitudes toward technology use: A meta-analysis. *Computers & Education, 105*, 1-13.

Carbonilla Gorra, V., & Bhati, S. S. (2016). Students' perception on use of technology in the classroom at higher education institutions in Philippines. *Asian Journal of Education and e-Learning, 4*(3), 92-103.

Foronda, V. R. (2011). Integrating information and communication technology into education: A study of the iSchools Project in Camarines Sur, Philippines. *Journal of Developments in Sustainable Agriculture, 6*, 101-113.

Gonzales, G. (2019). Filipinos spend most time online, on social media worldwide – report. *Rappler*. https://www.rappler.com/technology/news/222407-philippines-online-use-2019-hootsuite-we-are-social-report.

Jin, W., & Junio-Sabio, C. (2018). Potential use of mobile devices in selected public senior high schools in the city of Manila Philippines. *International Journal of Learning, Teaching and Educational Research, 17*(4), 102-114. https://doi.org/10.26803/ijlter.17.4.7

Librero, F., Ramos, A. J., Ranga, A. I., Triñona, J., & Lambert, D. (2007). Uses of the cell phone for education in the Philippines and Mongolia. *Distance Education*, *28*(2), 231-244. DOI: 10.1080/01587910701439266

Lorenzo, A. R. (2016). Effectiveness of the Computer and Internet Literacy Project in public high schools of Tarlac Province, Philippines. *TOJET: The Turkish Online Journal of Educational Technology, 15*, 2-38.

McLaren, K. (2019 February 7). Why are technology skills so important to today's students. *Immerse Education*. https://www.immerse.education/why-are-tech-skills-so-important-to-todays-students/

National Center for Educational Statistics. (2002). *Technology in schools: Suggestions, tools and guidelines for assessing technology in elementary and secondary education*. https://nces.ed.gov/pubs2003/2003313.pdf

Rainie, L., & Silver, L. (2019). *Mobile divides in emerging economies*. Pew Research Center. https://www.pewresearch.org/internet/2019/11/20/mobile-divides-in-emerging-economies/

Reyes, R. R. (2017 October 7). *Mobile technology to grow further in the Philippines*. https://businessmirror.com.ph/2017/10/07/mobile-technology-to-grow-further-in-the-philippines/

Sarmiento, D. H., & Orale, R. L. (2016). Senior high school curriculum in the Philippines, USA, and Japan. *Journal of Academic Research*, *1*(3), 12-23.

Stauffer, B. (2020 March 19). *What are 21st century skills?* https://www.aeseducation.com/blog/what-are-21st-century-skills

United Nations Educational, Scientific, and Cultural Organization (UNESCO). (2013). *UNESCO training guide on ICT multimedia integration for teaching and learning*. Bangkok: Asia Pacific Regional Bureau for Education.

Valk, J-H., Rashid, A. T., & Elder, L. (2010). Using mobile phones to improve educational outcomes: An analysis of evidence from Asia. *International Review of Research in Open and Distance Learning, 11*(1), 117-140.

Wang, P-Y. (2013). Examining the digital divide between rural and urban schools: Technology availability, teachers' integration level and students' perception. *Journal of Curriculum and Teaching, 2*(2), 127-139.

The factors causing the degree of changes of students in Australia and Japan

Kimura Akinori
a.kimura27@gmail.com
Doctor student and Elemetary school teacher
Kansai University, Umekoji Elementary school
Kyoto, Japan

Kurokami Haruo
kurokami@mbc.ocn.ne.jp
Professor
Kansai University
Osaka, Japan

Yoshino Keiko and Dominic Graham
Belair primary school
Adelaide, Australia

Kimura et. al (2020) developed an international exchange unit between Australian and Japanese students using iPads. It is, however, revealed that the effects of the unit were stronger in Japanese students. This study clarifies the cause of unbalanced results and points of improvement of the unit. Semi-structured interviews were conducted with two Australian teachers. The interview highlighted three major differences between Australian and Japanese settings. The readiness of the students and group size are important. In depth inquiry with appropriate objectives and enough hours is crucial. The infrastructure of ICT will be fundamental for the inquiry. Meeting these points of improvement will lead to fruitful cultural exchange learning.

Key words: International exchange, tablet PC, ability to use information, communication skills

1. BACKGROUND

The development of ICT made the world a small village. Mutual understanding among heterogeneous groups is stressed in Japanese course of study launched in 2017. Japanese government decided to start teaching English language activities two years earlier, namely from the third year of elementary school.

In the movement, Kimura implemented an international exchange unit in 2018. The exchange was between Grade 4 students in Adelaide and Grade 5 students in Kyoto, using video conferencing to meet repeatedly (Kimura, A. et. al, 2020). The unit focused not only to communication skills, information skills and attitudes toward the exchange, and meta-cognitive abilities. Kimura (2020) reported the gain in all of these three targets in Japanese students. As for Australia students, however, the gain was limited.

Table 1 shows the flow of exchange unit. The unit was an inquiry based and held for two months in late 2018. Students in both countries used iPad to prepare materials and communicate each other in a small group. The exchange was in both languages separating the duration into two parts: to Japanese

speaking time and English speaking time. Pre-Post survey was conducted. As mentioned before, Japanese students gained higher communication and information skills significantly. Their attitudes to exchange culture changed positively. They could get higher meta-cognitive abilities on the exchange. As for the Australian students, the communication and information skills, and the attitude were not so highly changed than Japanese students. There was no significant change in meta-cognitive abilities.

Table 1 The flow of the exchange unit

<First phase> - Gathering materials to introduce each school and culture and preparing questions on the other culture - Ordering and analyzing materials - Organizing materials - Introducing myself, each school and culture, and questioning each other
<Second phase> - Reflecting on the previous exchange and making deep questions - Gathering materials to answer and making deeper questions - Ordering and analyzing materials - Organizing materials to answer and explain their own culture deeply - Exchanging the information and questioning each other
<Third phase> - Reflecting on the cultural information from the other side and making deeper questions - Gathering materials to explain their own cultures - Organizing the materials to explain their own cultures - Deepening the cultural information through dialogue to make mutual understanding

2. PURPOSE

The purpose of the study is to clarify the cause of the less gain and change in Australian students and figure out points of improvement.

3. METHODOLOGY

Semi-structured interviews using the questionnaire below were conducted with two Australian teachers who were in charge of the unit.

Table 2. Questionnaire to Australian Teachers

- To which subject matters did you related the unit?
- How many classes a week did you set to the unit?
- How many classes did you need to prepare the exchange?
- What objectives did you set for the unit?
- How many iPads did you prepare for the exchange?
-What kind of media did the students use to communicate with Japanese students?
- How did the students use the media?
- What kind of media did the students use other than to communicate with Japanese students?
- How did the students use the media?

4.RESULTS AND DISCUSSION

The results of the interviews were documented and organized into the left column in table 3. The right column was, then, completed based on Japanese situation.

Table 3. Comparison of the situations in Australia and Japan

	Australia	Japan
1, Number of people	54 students (27 per class) 3 people per group	72 students (36 per class) 4 people per group
2, School year	Gread4 (9-10 years old.)	Grade 5 (10-11 years old)
3, Subjects and areas where exchange classes were held	Japanese language	Integrated study
4, Number of hours per week to work on the project and the number of hours leading up to the interaction	Japanese language (2 times a week) One phase (2 hours for research,1 hour for exchange) Total 9hours	Integrated study (3 times a week) One phase (3 hours for research, 1 hour for exchange) Total 12hours
5, Objectives of the subjects and areas in which they were implemented	Communicate with students by using the Japanese phrases they have learned in the past and enjoy the exchange.	Learning about other cultures through international exchange in an inquisitive manner
6, Purpose of the children	Communicate in the Japanese language that you have learned.	Learn about Australian culture and lifestyle through exchanges.
7, Teacher	Japanese Language teacher (Main) Homeroom teacher (Support)	homeroom teacher

8, Number of tablet PCs	14 tablet computers (1 in 4)	One tablet PC per person
9, Use of Tablet PC	Each person was not at liberty to make use of it at any time.	Each person was free to make use of the situation at any time.
10, Media used by children during interactions and how to use them	＜Paper＞ They presented illustrations of what he wanted to convey and Japanese language on paper.	＜Tablet PC＞ The presentation materials prepared by the students were presented. ＜Tablet PCs and paper＞ I had read the manuscript that I had prepared and saved in advance.
11, Media used by children outside of interaction and how to use them	＜Paper＞ Students wrote about what they wanted to say with illustrations, English words, and Japanese. Prepared sentences in Japanese while referring to the teacher's sentence list.	＜Tablet PC＞ They prepared presentation materials to be presented during exchanges. Translated what I wanted to say into English. I researched about Australia when asking questions. ＜Paper＞ They described the English text of what he wanted to convey.

72 students (36 per class) in Japan and 54 students (27 per class) joined the unit. Each group in Japan has four students and three in Australia. The fewer number in Australia makes students have more opportunities to communicate, but it may be a burden to prepare materials and organize.

Students in Australia were grade 4 and those in Japan were grade 5. Japanese students may have been more mature and ready to interact with foreign students through video conference. Australian teacher said it was difficult for her students to communicate and inquire under the circumstance. Japanese students are used to inquiry method to gather, order, analyze, and organize information more than Australian students. This may be the cause of the less change in them.

Third to seventh viewpoints of comparison reveal the difference of the conditions of the unit. The Japanese side had a total of 12 hours for the unit as integrated studies and stressed on inquiry about Australian culture to understand their lifestyle. On the other hand, Australian students spend just 9 hours for the unit and the aims were to enjoy communication in Japanese through the exchange. The difference in objectives may lead to the difference in the hours for the unit. Japanese students devoted more eagerly themselves to introduce their culture and understand Australian culture and lifestyle compared to Australian students. Australian students could not have enough time to prepare the exchange and it was not easy to engage in the exchange inquiry manner. The difference may be the cause of the larger gain in Japanese students.

The ICT conditions were also different. Japanese students had their own iPad. Four students in Australia, though, shared an iPad and it was difficult for them to use iPads freely in researching and organizing information. It may have led to small gain in information skill of them.

The difference in ICT condition also influenced the way to proceed learning. Japanese students used paper media and iPads flexibly according to their purposes. They gather materials, organized them and made presentation slides with iPads and prepared scripts for the presentation with paper media. While Australian students did all of the activity with paper media. They used iPad only for communication with Japanese students. This is because the objectives of the activities focused on making sentences and

enjoying communication in Japanese language. The grade four students may need much more time to research and organize information with iPad than hours to be allocated to the activities.

5.SUMMARY

The comparison between Australian and Japanese conditions revealed for major differences: the number of students, the grade level of students, the degree of inquiry, and the frequencies and usage of media.

These differences may be the cause of less/no change in Australian students in the communication and information skills, and the attitude toward exchange and the meta-cognitive abilities.

The points of improvement in the international exchange program are deprived form the differences. The first, students should have enough readiness: more than grade five level will be desirable, and the group size will be four rather than three. The second, the unit should be related to any subject area using inquiry method like making questions, gathering materials to answer them, ordering and analyzing information, and organizing them to share. ICT infrastructure are also important. Students should engage in the inquiry using ICT freely. Meeting these points will lead to increase students' communication and information skills, fostering attitudes towards cultural understanding, and developing meta-cognitive abilities.

REFERENCES

Kimura, A. Kurokami, H. & Taniguchi, K. (2020). Development and Effect of 'International Exchange Curriculum' Utilizing Tablet PC at Elementary School. *Japanese journal of educational media research.26.2*.

Ministry of Education, Culture, Sports, Science and Technology (MEXT) (2017a). Foreign Language Activities and Foreign Language Section of the Elementary School Course of Study:6-7

Ministry of Education, Culture, Sports, Science and Technology (MEXT) (2017b). Elementary School G uidelines for the Course of Study, Commentary on Integrated Learning Time: 9,61

A Meta-analysis Review of Effects of Critical Reading Teaching on Students' Writing Argument Skills in China

Xiaoli Zheng
tilly222@163.com
Associate Professor
Wenzhou University 325035
Wenzhou, China

Jue Yu
Catyu1122@gmail.com
Doctoral student
Chonnam National University
Gwangju, South Korea

Yipin Huang
467917748@qq.com
Doctoral student
Chonnam National University
Gwangju, South Korea

Yating Zheng
782031723@qq.com
Undergraduate
Wenzhou University 325035
Wenzhou, China

The 21st century is an era of "knowledge and information explosion". How to selectively acquire knowledge and information in a limited time requires us to analyze and evaluate it using critical thinking, and finally make judgments and choices. The effective way to develop critical thinking ability is critical reading teaching. This study selects the experimental research or quasi-experimental research literature related to this topic at home and abroad as the research object, and uses meta-analysis to focus on the impact of critical reading teaching on the level of student writing argumentation, that is, the criticality of critical reading teaching on students Thinking ability, critical reading ability, the use of critical reading strategies and the influence of writing ability, as well as the differences in the effect of experimental cycles and semesters on the level of students' writing argumentation. The research results show that: (1) The overall effect size of critical reading teaching on the level of students' writing argument is 0.861. Critical reading teaching has a significant positive effect on the level of student's writing argument; (2) The length of the experimental period has an impact on student writing The level of argumentation has an influence, and regardless of the length of the experimental period, it has a positive effect on the level of student's writing argumentation; (3) Critical reading teaching in different academic years can effectively promote the level of student's writing argumentation. good. Based on these research conclusions, finally put forward some suggestions for future research and development.

Key words: critical reading teaching; composition writing; argumentation; argument; meta-analysis

INTRODUCTION

In Yang Chunyan's research, critical reading teaching is defined by teachers using appropria te teaching strategies in class to encourage students to express their opinions, bravely and reasona bly question, and in this process allow students to actively use critical reading. This new way of reading (Zhang, 2016) is clearly stated in the senior middle school English curriculum standard t

hat by means of a critical reading teaching model, students' creativity and critical thinking ability can be developed. In this process, it is necessary to create a good classroom teaching context an d teaching activities so that students' creativity and imagination have opening to be brought into play. Therefore, the content of the curriculum standard provides conceptual support for the develo pment of critical reading teaching mode (Chen, 2011). Baska and Bracken (2009) proposed that s ome behaviors should be taught in reading classes to enhance critical thinking and reading compr ehension. The way to effectively improve students' reading ability and critical thinking ability is t o conduct critical reading teaching (Zhu, 2012). Therefore, critical reading teaching is an urgent r equirement of today's information society and higher education, and it also satisfies the developm ent needs of students.

Different empirical studies at home and abroad have put forward overlapping but different opinions on whether critical reading teaching can really affect students' writing argumentation abil ity. Some experimental methods focused on the impact on different stages, while other methods f ocused more on the impact of different teaching modes, so they have not been able to draw a u nified conclusion. For example, when Ge (2014) explored the critical reading teaching model in college English classrooms, he put forward the theory that students should be the mainstay and t he teacher should be the supplementary, and the training of critical reading strategies should be i ntegrated into three teaching stages of reading. The research results showed that teaching through the above-mentioned critical reading teaching model can promote students' awareness of using crit ical reading strategies for reading and the frequency of use (Ge, 2014); Zhu Wei has proved thro ugh writing teaching experiments that critical thinking ability is directly proportional to students' writing level Relationship (Zhu, 2012); Yan (2014) conducted a related study on the impact of cr itical thinking ability on writing level of graduate students who are not majors in English. The r esults of the study found that the overall critical thinking ability of students is at a lower middle level, and the critical thinking ability is not Their writing level has a positive effect (Yan, 2014). In summary, this article adopted meta-analysis based on 45 domestic and foreign experimental or quasi-experimental research works in the past ten years. Among them, we study the impact of cr itical reading teaching on the level of students' writing argumentation, focusing on critical reading teaching strategies and methods. The purpose of present meta-analysis is to understand the overall effect of critical reading teaching exerted on students' writing argumentation level, while paying a ttention to some other complex factors that affect the results. In order to achieve this purpose, th is study explored effects of two moderating variables (i.e. experiment period and school grade) o n students' writing argumentation level.

RESEARCH DESIGN & METHODS

Meta-analysis is a statistical analysis method to detect the overall effect of the literature, mainly by collecting multiple experimental research data related to the theme and obtaining the average effect value. Its main functions include quantitatively estimating research effects and discovering the deficiencies of previous studies. It has been widely used in medical clinical trials, diagnosis and other fields (Zheng, 2013). These steps must be completed before meta-analysis: definition of research questions, literature retrieval, literature screening, data and related information extraction, research publication bias, heterogeneity test and analysis, and effect size selection (Shan, Gong, Li, & Yan, 2019). For the sake of rigor, the study was conducted from the above seven steps before analyzing the data, and each step was described in detail.

Definition of the research question

The research question of this study was to explore the effect of critical reading teaching o n students' writing argumentation level. The student's writing argumentation level referred to the r esults of students' writing ability and argumentation level under a specific teaching mode. The st udent's writing argumentation level mainly included four aspects: critical thinking ability, critical r eading ability, awareness of using critical reading strategy, and writing ability.

Literature retrieval

In this study, domestic and foreign journals, such as "CNKI", "Wanfang Database", "IEEE", and "Web of Science", as well as master and doctoral databases were selected as the scope of th e literature search. The publishing time was restricted to January 2010-January 2020. The key ter ms searching for critical reading teaching as an independent variable included: "Critical Reading Teaching" and "Critical Reading Teaching"; the terms searching for students' writing argumentatio n level as a dependent variable included: "writing level", "argumentation ability", "Argument Leve l", "Writing Skills" and "Effects of critical reading on argument level" etc.

Literature screening

This study formulated relevant rules for the selection of literature in order to enhance the r igor of the meta-analysis results: (1) First, the research topic should be related to the impact of critical reading teaching on students' writing argumentation level; (2) Research methods should be Random experimental design or quasi-experimental design; (3) The experimental research is to co mpare the critical reading teaching group with the traditional reading teaching group, or have pre -test and post-test, and the pretest is conducted before the critical reading teaching , Post-test is administered after the critical reading teaching; (4) There should be enough statistical information in the literature to estimate the effect size. If in the literature only descriptive statistics are provi ded or the p-value without any effect size report, such a study is directly excluded; (5) The subj ects of the experiment are students, such as primary school students, secondary education student

s and higher education students.

In this study, the established keywords were first used to retrieve the literature, and then th e literature was screened according to the literature screening rules. The first step was to enter t he relevant information of the searched literature, such as the title of the paper, the name of the author, and the publishing time into Excel, and then delete the articles that are not related to the established experimental theme, and delete the duplicate documents focusing on Rule 1, Rule 4 a nd Rule 5 during this period. The second step was to review the obtained literature in depth, fo cusing on the experimental design specifications and the comprehensiveness of the research data, focusing on rules 2 and 3. Finally, 45 valid research papers at home and abroad were left for th e meta-analysis.

Extraction of data and related information

Establishment of the coding system

The research object of this study was critical reading teaching, and the dependent va riable was the student's writing demonstration level, including four aspects: critical thinking abilit y, critical reading ability, awareness of using critical reading strategies and writing ability. At the same time, the teaching mode, experiment period, and learning period were used as moderating v ariables.

Eigenvalue coding

This study encoded critical thinking ability, critical reading ability, awareness of using critic al reading strategies, and writing ability as dependent variables. The control variables were the e xperimental period and school age. The encoding table was as follows (see Table 1).

Table 1 Moderating variable coding for meta-analysis

Moderating variables	Encoding
Experimental period	b1.A month to three months；b2Three months to six months；b3.More than half a year
Phase of studying	c1.Senior middle school；c2.College

Meta-analysis Instrument

Popular meta-analysis instruments include Review Manager, Comprehensive Meta Analysis 3. 0 and other software. According to the needs of this research, this study chose comprehensive m eta-analysis 3.0 (CMA) software for data collection and analysis. There are five specific analysis tasks: calculation of literature effect size, calculation of overall effect size analysis of publication bias, heterogeneity test and effect analysis of moderating variables.

RESULTS

Publication bias

A common method of detecting systematic errors in meta-analyses is called publication bias, an indicator that studies that exceed a statistically significant level are more likely to be publishe d than those that do not. There are many ways to estimate whether there is publication bias in meta-analysis methods. In this study, the publication bias of this study was comprehensively asses sed using funnel plot, Begg rank correlation and Fail-safe N (Li & Chai, 2018). The funnel plot of this study was shown in the following figure 1. According to the funnel plot of the meta-anal ysisdistribution position of the influence value of most studies is evenly and symmetrically distrib uted on both sides of the average effect size, indicating that the publication of most studies is le ss likely to be biased. Begg rank correlation test indicated that T =0.372, P <0.005, and data res ults indicated possible publication bias. Fail-safe N is used to assess the unpublished results need ed to achieve a negligible impact on the overall level of published research. The metric was 5*n +10, where n represented the number of meta-analysis documents entered in the study. In this st udy, the loss safety factor was 3195, far exceeding 235 (45*5+10). This data indicated that publi shed overall effect size were not affected by unpublished study effect size. Combined with the a bove three test methods, it can be concluded that the meta-analysis results of this study are stabl e and the publication bias is not obvious.

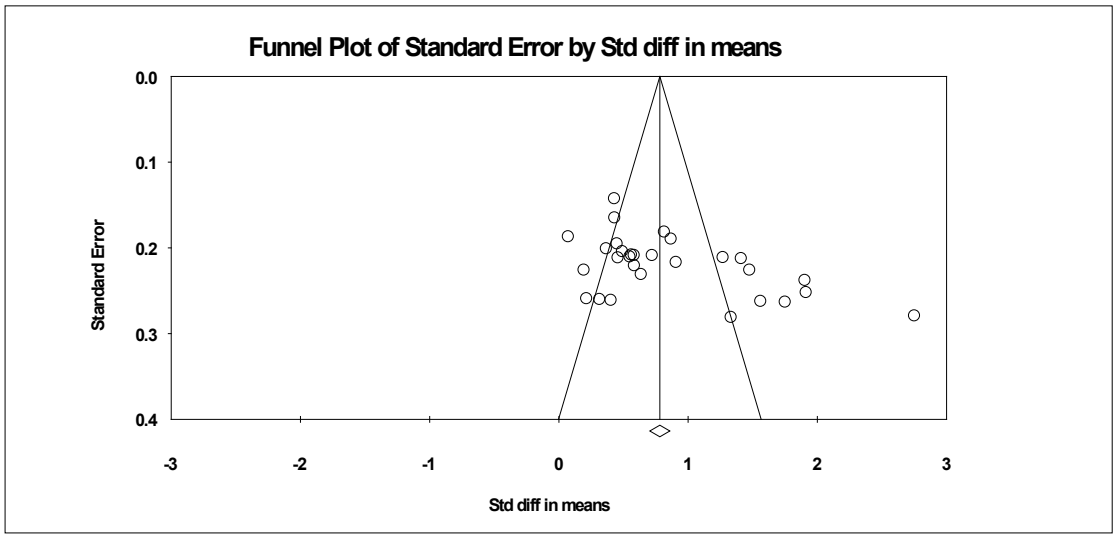


Figure 1. the Funnel plot of publication bias

Heterogeneity test

The heterogeneity test results of the study samples showed that the Q value was 200.913 (P <0.001) and the I2 value was 86.064%, greater than 70%. This difference may be due to fact ors such as the length of the experimental cycle and the difference in publication time. The resul ts showed that there were heterogeneity differences among the samples studied. Therefore, this st udy uses the random effect model to analyze the influence of critical reading teaching on student s' writing argumentation level.

Effect size selection

In this study, standardized mean difference (SMD) was selected as the effect value to analyze and discuss the influence of critical reading teaching on students' writing argumentation level, and SMD was used as the effect value to evaluate the influence difference of moderator variables.

Comprehensive effect of critical Reading teaching on students' writing argumentation level

Overall effect size

The Composite effect value of the random effect model was shown below (Table 2). The combined effect value (SMD) of critical reading teaching on students' writing argument level is 0.861 and P <0.001, indicating that positive statistical significance level is reached. Cohen(1992) proposed that when the impact value is about 0.2, the impact can be considered small. When the effect value is around 0.5, the influence is considered moderate; When the effect value is about 0.8, it is considered to have a significant effect (Cohen, 1992). So, according to the above theory, it can be concluded that the teaching of critical reading has a significant positive influence on the students' writing argumentation level. The use of critical reading teaching can effectively help students improve their argumentation level in writing.

Table 2 Composite effect value of the random effect model

Effect model	value（*SMD*）	95% CI		Two-tail test	
		Lower	Upper	Z	P
random	0.861	0.652	1.070	8.065	0.000

Effects of critical reading teaching on students' critical thinking, critical reading competence, awareness of using critical reading strategy and writing competence

According to the above passage, the writing argumentation level of students can be divided into four aspects: critical thinking ability, critical reading ability, critical reading strategy use awareness and writing ability. The statistical results show that the effect values of students' critical thinking ability, critical reading ability, awareness of critical reading strategy use and writing ability were all between 0.6 and 0.9, and P <0.001. It indicates that the teaching of critical reading has a significant positive impact on all of the four aspects, and has the greatest impact on students' critical reading ability. The influence value of writing ability was 0.633, P <0.01, indicating that critical reading teaching has a positive effect on improving students' writing ability. According to the heterogeneity test results (Q=10.100, P =0.006), there is no significant difference in the four aspects, and the teaching of critical reading has a positive effect on the four aspects related to students' writing argumentation level.

Table 3 Effects of critical reading teaching

	papers	Effect size	Standard error	variance	95% CI		Q
					lower	upper	
Critical thinking	27	0.875	0.114	0.013	0.651	1.100	Q=10.100 p=0.006
Critical readier competence	23	0.974	0.124	0.015	0.730	1.218	
Awareness of using critical reading strategies	13	0.965	0.150	0.022	0.672	1.258	
Writing competence	3	0.633	0.291	0.085	0.062	1.204	

Effects of moderating variables on students' writing argumentation level

1. The influence of different experimental periods on critical reading teaching and on the argumentation level of students' writing is different

According to the code above, the effects of three different experimental periods on the improvement of students' argumentation in critical reading teaching are compared and analyzed (As shown in Table 4). The results show that effect values of the length of the three experimental cycles of "one month to three months", "three months to half a year" and "more than half a year" were all greater than 0. And all met the statistical significance requirement ($p<0.001$). It is finding that these three experimental cycles have significant positive effects on students' writing argumentation level. And among the three experimental periods, the effect value of the experimental time period dimension of "three months to half a year" was the highest: 0.885. This indicates that the experiment period of three to six months has a significant positive effect on students' writing argumentation level. The effect value of the experimental period of "one month to three months" and "more than half a year" also exceeded 0.6, indicating that these two experimental periods also had a moderately positive effect on students' writing argumentation level. Heterogeneity test results ($Q=11.078$, $p=0.050$) showed that there were differences between different experimental periods. In other words, different experiment cycles have different influences on students' writing argumentation level. The results showed that the experimental period from three months to half a year was the most prominent.

Table 4 Effects of experimental periods

Experimental period	papers	Effect size	Standard error	variance	95% CI		Q
					lower	upper	
Less than 3 months	9	0.739	0.175	0.031	0.396	1.082	Q=11.078 p=0.050
3-6 months	12	0.885	0.143	0.021	0.604	1.165	
More than 6 months	2	0.655	0.151	0.023	0.358	0.952	

2.The effect of different school grade on critical reading teaching on students' writing argumentation level is different

Since students at different school grade are affected differently by the teaching of critical reading, the effect of improving students' writing argumentation level is also different, so the corresponding effect value of the two school ages is calculated. As shown in the figure below, the effect value of high school students was 0.902 (P <0.001) higher than that of college students, indicating that critical reading teaching had a significant positive impact on high school students. The effect value of college students was 0.810 and reached the significant level (P <0.001), indicating that the teaching of critical reading had a moderate high positive effect on the level of writing argumentation. Through the analysis results of the heterogeneity test (Q=15.887, P =0.044), it can be known that there are differences among different school grade, that is, the impact of critical reading teaching on different school grade is different.

Table 5 Effects of different school grade

grade	papers	Effect size	Standard error	variance	95% CI		Q
					Lower	upper	
High school	20	0.902	0.130	0.017	0.648	1.157	Q=15.887
college	8	0.810	0.215	0.046	0.388	1.231	p=0.044

REFERENCES

Chen,Z.(2011).An empirical study on high school students' English critical reading teaching. Master Degree dissertation, Yanan University.

Cohen, J(1992). A power primer. Psychological Bulletin,112(1), 155-159.

Ge,C.E.(2014).An experimental study on critical reading teaching model in English curriculum for undergraduates. Master Degree dissertation, Hebei Normal University.

Li,Y.,Chai,Y.L.(2018).Effects of Minding concept on academic achievements—meta-analysis of international minding concept application during the last decade. Chinese Long-distance Education,16-28.

Shan,J.H.,Gong,L.L.Li,Y.,Yan,H.B.(2019).Effects of Educational Robots on learning performance based on meta-analysis of 49 experimental or quasi-experimental studies. Chinese Audio-visual Education,5(1),76-83.

Yan,Y.(2014).Effects of critical thinking on English writing level of undergraduates from non-English majors. Master Degree dissertation, Shandong Normal University.

Zhang,X.X.(2016).An experimental study on critical reading teaching in high school English curriculum. Master degree dissertation, Shandong Normal University.

Zheng,M.H.(2013).Meta-analysis application and example practice. Beijing: People Sanitation Publishing house,14-27.

Zhu,W. (2012). Improving writing competence through cultivating critical thinking ability of students majoring in English. Master Degree dissertation, Foreign Language College of Sichuang.

Investigation of Structures of Television Documentary Representation Based on Qualitative Analysis of Descriptions by Program Directors

Asuka MURAI
asuka.ukebe.q3@dc.tohoku.ac.jp
Doctoral student
Tohoku University
Sendai, Japan

Tatsuya HORITA
horita@horilab.info
Professor
Tohoku University
Sendai, Japan

The purpose of the current study was to obtain suggestions for media literacy education designed to foster people who can contribute constructive criticism and discussion. To that end, we clarified the structure of representation in television documentaries considered by Japanese program directors. Specifically, we extracted descriptions corresponding to the key concepts of media literacy described by D. Buckingham from the descriptions of the program directors' books, and examined relationships between the groups created by similar items. The following four points were revealed:
(1) To understand one of the basic principles of media literacy—that the media do not reflect but re-present the world—it may be helpful to know about editing. In addition, understanding this principle could deepen students' understanding about expression techniques.
(2) Japanese program directors have conflicting ideas about whether to express the existence of the director or not, and whether to interfere with the targets of shooting or not. Ideas based on two different documentary forms may be behind this confliction; "direct cinema" and "cinema verité".
(3) Some program directors assert that they aim to obey what is known as the "principle of equity in the broadcasting law", whereas others feel that it is difficult to obey.
(4) In television documentaries, the reasons why particular things are not broadcast are influenced by complex relationships between various people, including the subjects of the documentary, the audience, the sponsors, and the directors.

Key words: Media Literacy, Media Education, Representation, Television, Documentary

1. INTRODUCTION

Concerns regarding distrust of the mass media are common in many countries (Newman et al. 2017). Researchers have reported that this distrust is a movement to blame the mass media that they do not like, and refuse or boycott access. This could undermine democracy (Hayashi 2017). In Japan, "mass-gomi," which is a derogatory term that combines the Japanese words for "mass media" and "waste," is common on the internet. As of July 4, 2020, a search for "mass-gomi" on Google returns 4.21 million hits. Mass-media scandals such as those involving fabrications and false reports were common in Japan in the 1980s and 1990s and, as a result, people's interest in media literacy education increased (Mizukoshi 2002; Nakahashi 2014). One of the goal of media literacy education is to foster human resources who want to improve the media, rather than encourage people to view the media with cynicism (e.g., Horita, 2004; Mizukoshi, 2002). However, a critical perspective can easily transform into cynicism ― a blanket distrust of everything and everyone, and especially of the media (Buckingham, 2019). The present concerns

regarding mass-media distrust mean that reconsidering methods of media literacy education and determining the most ideal approach has now attained great significance.

Many mass-media scandals are related to misconduct on the part of practitioners; consequently, such scandals could be avoided by educating practitioners in best practices. However, many directors of television programs have complained that recent criticisms about television—for example, that practitioners deliberately trick the audience—are often unfounded (e.g., Mizushima, 2014). This indicates that, in the context of television programs, to implement more constructive criticism and discussion, it is necessary for audiences to know the mindsets of program directors.

In this research, the sender of information about media in general is referred to as a "practitioner," and the receiver of information is the "audience." When referring to a TV program director, we use the term “program director” for specification.

Topics such as “fake news,” “biased news,” and “information hiding” are often mentioned in media criticism, and correspond to “representation,” one of the key concepts of media literacy. Representation refers to the process through which the “media re-constructs and re-presents real-world people, places, events, and attitudes to create a new representation of ‘reality’” (Suzuki, 2006). Representation is the central unifying concept of media education (Masterman, 1989). In Japan, there has been some debate regarding the representation of television documentary programs, and it has been highlighted that there may be a difference in perspective between program directors and the audience. Since media literacy relates to all areas of education, broadcasting, politics, and cultural systems in society, it should reflect the uniqueness and peculiarities of the culture in which it is practiced (Masterman, 1995). However existing media studies have failed to determine the mindset of program directors in Japan. Since the invention of the film, the “documentary” genre refers to films that present facts, and is regarded as “the origin of filmmaking (Usui 2003). However, the documentary form can be controversial and difficult to define (Lewis 2008).

From the above, the purpose of the current study is to obtain suggestions for media literacy education designed to foster people who can contribute constructive criticism and discussion. To that end, we clarified the structure of representation in television documentaries considered by Japanese program directors.

2. RESEARCH METHODS

2.1. Analysis Target

In this study, we analyzed six books by Japanese program directors regarding television documentaries (hereinafter referred to as “books by program directors”; Table 1). We analyzed books because: (1) There is a large number of books by such program directors, and these books provide easy access to the target information for this study; (2) few people can openly discuss the methods by which

television programs are produced (Hasegawa 2014), meaning we could not obtain sufficient data through interview surveys.

The procedure for extracting the target books was as follows. First, using "NDL ONLINE," a search site for the National Diet Library of Japan, we searched for books using the following three conditions: (1) publication year is between 1993 and 2018, (2) the title includes "television," "TV," "documentary," or "documentarist," (3) the title does not include "movie." The start date was set to 1993 because the current documentary production guidelines in Japan have existed since 1993, indicating that the directors' mindset in books published before 1993 may differ significantly from that in similar books published later.

The extracted books were classified into three categories based on the authors' affiliations: public broadcasting (NHK), commercial broadcasting, and production company. For each affiliation, we analyzed the books of two young authors. Previous studies have suggested that perspectives of television documentaries change over time (Murai 2017); the reason we targeted young authors was that it was more likely that such authors would reflect the ideas of current program directors.

Table 1. Books analyzed.

	Author	Affiliation	Pub Y	Title (Translated from Japanese)	Publisher
1	Yoshiaki Yamato	Public broadcasting	2000	Introduction to TV Production: Planning, Filming, Editing (Terebi Seisaku Nyumon: Kikaku, Syuzai, Hensyu)	Heibonsha
2	Masataka Kawamura	Public broadcasting	2009	What is a Documentary?: The work of a TV Director, Revised (Documentary Toha Nanika: Terebi Director no Shigoto Kaiteiban)	Bronze Publishing
3	Michiyo Owaki	Commercial broadcasting	2012	Staring at the Present of Society: Creating TV Documentaries (Shakai no Ima wo Mitsumete TV Documentary wo Tsukuru)	Iwanami Shoten
4	Hiroki Takahashi	Commercial broadcasting	2013	TV Directors' Directing Techniques: How to Make Things Attractive (Terebi Director no Enshutsu Jutu: Monogoto no Miryoku wo Hikidasu Houhou)	Chikumashobo
5	Tatsuya Mori	Production company	2004	Documentaries Tell Lies (Documentary ha Uso wo Tsuku)	Soshisha
6	Kenta Okumura	Production company	2013	Still, TV doesn't Die: Live in the Field of Video Production! (Soredemo Terebi ha Shinanai: Eizo Seisaku No Genba De Ikiru)	Gijutsu-Hyohron Co.

2.2. Analysis Method

From the six books, we extracted descriptions corresponding to the "representation" concept of Buckingham's "four key concepts" of media education (Buckingham 2002). Four key concepts represent the "state of the art" in media education, and comprise Production, Language, Representation, and Audience. The Representation concept comprises seven categories: [a. Realism], [b. Telling the truth], [c. Presence and absence], [d. Bias and objectivity], [e. Stereotyping], [f. Interpretations], and [g. Influences]. [a. Realism] and [b. Telling the Truth] correspond to controversial subjects in documentaries; the presence of these subcategories indicated that Buckingham's "representation" was suitable for use in this

study. The descriptions from the books were organized into codes and classified into Representation categories.

Codes were grouped with similar items by referring to the Affinity diagram (hereinafter, “the KJ method”; Kawakita 1986), and a label summarizing the contents was created for each group. The KJ method is a qualitative research method in which the analysts determine the meaning of the data.

Next, a layout diagram was created with reference to the KJ method. The contents of each group were spatially arranged to present the most meaningful mutual relationship. Groups that were particularly deeply related in terms of meaning were attributed symbols that represented the relationship in question. “Subcategories” were created by enclosing groups of similar themes within boxes.

3. RESULTS

Overall, 183 descriptions were extracted; figure 1 shows the layout diagram. The category names are enclosed in square brackets ([]), and the groups included in each category are enclosed in boxes. Identification numbers and category symbols were assigned to each group, which were labeled "a1,” “a2,” etc. Similar groups are enclosed in additional boxes, and subcategory names, enclosed in angle brackets (<>), are attributed to each. Descriptions concerning “e. Stereotyping,” “f. Interpretations,” and “g. Influences” could not be extracted.

The results are described below with reference to the KJ method. Group names are indicated by curly brackets ({}). The author’s interpretations are presented in parentheses.

The category [a. Realism] includes the subcategory <Reconstruction/representation of reality>, which indicates that program directors think (based on their own experience) that {a1. The meaning and impression of a message can be changed significantly by editing}. Therefore, they believe that documentaries are a {a3. Reconstruction/representation of the world perceived by the director}. Further, because they think that {a1. The meaning and impression of a message can be changed significantly by editing} (therefore, their edits convey the meaning and impression that they want to portray), they believe that {a2. The broadcasted video and information are part of the filmed images}. Thus, the documentaries become a {a3. Reconstruction/representation of the world perceived by the director} through the use of a small amount of video and information. Additionally, a documentary being a {a3. Reconstruction/representation of the world perceived by the director} is at the root of the method of {a4. Sometimes representing the past through reenactments or sample video}. However, program directors believe that they {a5. Should cover the situation properly and convey accurate information}. Regarding the <Inclusion of the existence of the director>, there are contradictory ideas, exemplified by the categories <Should be included> and <Should not be included>.

The next category is [b. Telling the truth]. Program directors think (because the target being filmed may be aware of the camera) that {b1. The reality that is filmed is actually a new reality created by the existence of a camera}. Here, there are two contradictory ideas regarding <Behavior toward the target>:

program directors {b2. Should film people who are not conscious of the camera} or {b3. Should intervene to tell the truth}.

The category [c. Presence and Absence] includes the subcategories <Reasons to broadcast> and <Reasons not to broadcast>. <Reasons to broadcast> comprises, in addition to awareness of <Audience> and <Expression>, consideration of whether the content is {c8. Suitable for the broadcasting station}, {c9. Compatible with production costs}, and {c10. Suitable for the present age}. <Reasons not to broadcast>

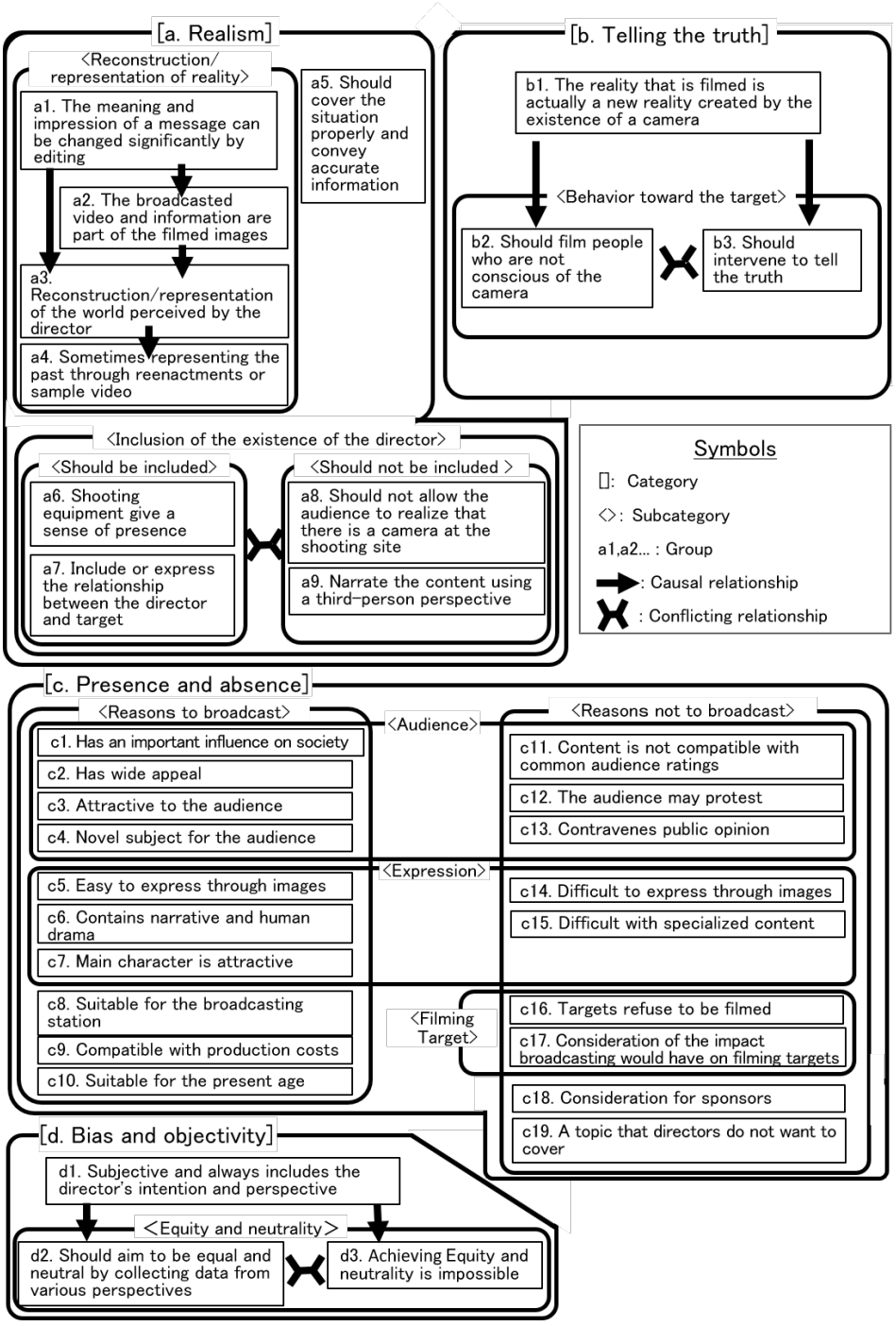


Figure 1. Relationships among the groups and subcategories

includes awareness of the <Audience>, <Expression>, and <Filming target>, as well as {c18. Consideration for sponsors} and {c19. A topic that directors do not want to cover}.

Regarding [d. Bias and objectivity], program directors believe that documentaries are {d1. Subjective and always include the director's intention and perspective}. Thus, regarding <Equity and neutrality>, they think that they {d2. Should aim to be equal and neutral by collecting data from various perspectives}. However, there is a contradictory view that {d3. Achieving equity and neutrality is impossible}.

4. DISCUSSION

A primary finding of this investigation is that there may be certain attitudes or experiences that influence program directors' unique perspectives regarding representation. For example, the attitude that {a1. The meaning and impression of a message can be changed significantly by editing} in [a. Realism] may induce two mindsets: {a2. The broadcasted video and information are part of the filmed images}, and documentaries are considered a {a3. Reconstruction/representation of the world perceived by the director}. Also, the concept of documentaries being a {a3. Reconstruction/representation of the world perceived by the director} may be the basis of the method of {a4. Sometimes representing the past through reenactments or sample video}. The idea that a documentary is a {a3. Reconstruction/representation of the world perceived by the director} also corresponds to a basic principle of media literacy: "The media do not reflect, but re-present the world" (Masterman 1989). To understand the program directors' awareness of these basic principles, it may be helpful to investigate their editing approaches; this may also deepen our understanding of methods of expression.

The second point is that there may be conflicting (or perceived as conflicting) ideas among program directors. Specifically, for <Inclusion of the existence of the director> in [a. Realism], <Behavior toward the target> in [b. Telling the truth], and <Equity and neutrality> in [d. Bias and objectivity], we found contradictory (or perceived as conflicting) ideas. Among these, the contradictory ideas in <Inclusion of the existence of the director> and in <Behavior toward the target> may be closely related to the "direct cinema" or "cinema *verité*" movement (Murayama, 2003). The ideas that the existence of the director <Should be included> and program directors {b3. Should intervene to tell the truth} are characteristic of "cinema *verité*". On the other hand, the concept that the existence of the director <Should not be included> and program directors {b2. Should film people who are not conscious of the camera} are characteristic of "direct cinema." This suggests that program directors of Japanese television documentaries have at least two mindsets in this regard.

The concept that program directors {d2. Should aim to be equal and neutral by collecting data from various perspectives} in <Equity and neutrality> in [d. Bias and objectivity] is based on the Principle of Equity in broadcasting law Article 4 (Ministry of Internal Affairs and Communications in

Japan 2019). The Principle of Equity in broadcasting law is difficult to implement because “what is equal in broadcasting law” is ambiguous (e.g., Hara 1997). Results of the current study suggest that television documentary directors may be aware of the principle of fairness, but may encounter difficulty implementing it.

The third point concerned [c. Presence and absence] and showed that <Reasons not to broadcast> are related to various people and organizations, such as the <Audience> and <Filming target>, requires “c18. Consideration for Sponsors,” and whether the subject is “c19. A topic that directors do not want to cover,” etc. Masterman(1985) highlighted the importance of grasping the interrelated nature of the complex web of influences at play within any media text. Overall, this point suggests that whether certain subjects are broadcast in Japanese television documentaries is determined by the relationships of various people, such as the audience, filming target, the sponsors, and the program directors themselves.

5.CONCLUSION

The purpose of the current study was to obtain suggestions for media literacy education designed to foster people who can contribute constructive criticism and discussion. To that end, we clarified the structure of representation in television documentaries considered by Japanese program directors. The following four points were revealed:

(1) To understand one of the basic principles of media literacy—that the media do not reflect but re-present the world—it may be helpful to know about editing. In addition, understanding this principle could deepen students’ understanding about expression techniques.

(2) Japanese program directors have conflicting ideas about whether to express the existence of the director or not, and whether to interfere with the targets of shooting or not. Ideas based on two different documentary forms may be behind this confliction; “direct cinema” and “cinema verité”.

(3) Some program directors assert that they aim to obey what is known as the “principle of equity in the broadcasting law”, whereas others feel that it is difficult to obey.

(4) In television documentaries, the reasons why particular things are not broadcast are influenced by complex relationships between various people, including the subjects of the documentary, the audience, the sponsors, and the directors.

Finally, we describe the implications of this study for further research. This study is based on a qualitative research method in which the analyst discerns meaning from the data, meaning the results require further analysis from the perspectives of others. In this study, we analyzed descriptions corresponding to the “representation” element of the four key concepts of media literacy. Other concepts, such as industry (audience rating, program budget, etc.) and director’s consciousness of the audience may also be closely related to “representation” attitudes. Further study in this regard is required. It is also necessary to verify the extent to which the description contents analyzed in this study are common to program directors.

REFERENCES

Buckingham, D. (2002). *Media Education: Literacy, Learning and Contemporary Culture*. Cambridge, UK: Polity.

Buckingham, D. (2019). Teaching Media in a 'Post-Truth' Age-Fake News, Media Bias and the Challenge for Media Literacy Education. *Cultura y Educación*, 31(2): 1-19.

Hara, Y. (1997). Journalism no Shisou (*The Thought of Journalism*). Tokyo: Iwanami Shoten.

Hayashi, K. (2017). *Media Fushin: Nani Ga Towarete Irunoka* (*Media Distrust: What is Being Asked?*). Tokyo: Iwanami Shoten.

Horita, T. (2004). *Media Tono Tsukiaikata Gakushu* (*Learning How to Interact with the Media*). Tokushima: Just Systems Corp.

Kawakita, J. (1986). *Konton Woshite Katarashimeru* (*The KJ Method: Extracting Meaning from Chaos*). Tokyo: Chuokoronsha.

Lewis, E. (2008). *Teaching Television at GCSE*. London: BFI Publishing.

Masterman, L. (1985). *Teaching the Media*. London: Comedia.

Masterman, L. (1989). *Media Awareness Education*: *Eighteen Basic Principles*. Retrieved from http://www.medialit.org/reading-room/media-awareness-education-eighteen-basic-principles

Masterman, L. (1995). Media Education Worldwide: Objectives, Values and Superhighways. *Media Development*, 2, 37-51.

Ministry of Internal Affairs and Communications in Japan. (2019). *Broadcasting Law*. Retrieved from https://www.tele.soumu.go.jp/horei/reiki_honbun/72490000001.html

Mizukoshi, S. (2002). *Digital Media Shakai* (*Digital Media Society*). Tokyo: Iwanami Shoten.

Mizushima, H. (2014). *Uchigawa Kara Mita Televi: Yarase, Netsuzou, Johososa no Kozo* (*TV from the Inside: A Structure of Set-up, Fabrication, and Information Manipulation*). Tokyo: Asahi Shimbun Publishing.

Murai, A. (2017). A Historical Analysis of the Birth of TV Documentary with a Focus on the Narratives about the Realism. *J. JF Oberlin Univ.: Stud. Lang. Cult.*, 8: 67-86.

Murayama, K. (2003). *Critical Words for Film History*. Tokyo: Film Art.

Nakahashi, Y. (2014). *Theory of Media Literacy: Media Education in the Social Media Age*. Tokyo: Hokuju Shuppan.

Newman, N., Fletcher, R., Kalogeropoulos, A., Levy, D. A. L., & Nielsen, R. K. (2017). *Reuters Institute Digital News Report 2017*. University of Oxford, Oxford: Institute for the Study of Journalism.

Suzuki, M. (2006). Translator's Notes. In D. Buckingham, *Media Literacy Education-Learning and Contemporary Culture* (M. Suzuki, Trans.; pp. 261-263), Kyoto: Sekaishisosha.

Usui, H. (2003). Terebi no kyokasho: Business Kozo Kara Seisaku Genba Made (*TV Textbook-From Business Structure to Production Site*). Kyoto: PHP Kenkyujo.

ePortfolios for Study Abroad Assessment and Improvement: Monitoring Students' Use of a Target Skill While Abroad

Miki Cutting
cutting@apu.ac.jp
Associate professor
Ritsumeikan Asia Pacific University
Beppu, Japan
Doctoral student
Kumamoto University
Kumamoto, Japan

Yoshiko Goda
ygoda@kumamoto-u.ac.jp
Associate professor
Kumamoto University
Kumamoto, Japan

Katsuaki Suzuki
ksuzuki@kumamoto-u.ac.jp
Professor
Kumamoto University
Kumamoto, Japan

Abstract:
ePortfolios, which are becoming a prominent tool for collecting experiential and developmental evidence during study abroad, need more research as a means of assessment. Our study made a systematic analysis of students' ePortfolios while abroad to understand how they used a target skill taught in pre-departure training, applying Kirkpatrick's training evaluation framework. The findings were then used to discuss how to improve the training. Contextualized analysis of ePortfolio revealed various cultural engagements in which the target skill was used. We found that ePortfolio also captured students' perspective changes and self-realizations as well as affective and behavioral aspects in their learning. Furthermore, a progressive trend in difficulty level of students' questions regarding culture was observed. Quantitative data of the survey results were then added to bolster the results. The evidence suggests that contexts simulated during pre-departure training matched real-life situations abroad but did not sufficiently cover the diversity of settings in which students can exercise the skill. We conclude that by employing a systematic assessment approach using ePortfolios, rich learning evidence to improve pre-departure training can be obtained.

Key words: ePortfolios, Assessment, Training evaluation, Education abroad

STUDY ABROAD ASSESSMENT

In this global era where people increasingly work across national boundaries, often interconnected virtually, higher education has been tasked with preparing students to better live and work together with people from different backgrounds by providing quality international education, such as study abroad programs. However, outcomes in international education, such as intercultural competence, defined as "behaving and communicating appropriately and effectively in intercultural situations" (Deardorff 2006, p. 255), are complex and therefore challenging to assess (Deardorff 2015, Fantini 2012). Despite the nature of intercultural competence being experiential, developmental, and interactional (Deardorff 2015),

institutions tend to over-rely on pre-post surveys, standard instruments, and self-report Likert items, which do not adequately capture students' learning and development, behavioral aspects, and evidence to explain the outcomes (Griffith et al. 2016, Deardorff 2015). Furthermore, evidence of student learning should be used to understand and improve their learning (Suskie 2018), yet in the area of study abroad, research to indicate how assessment can lead to program improvement is lacking (Salisbury 2015). To capture evidence of complex learning outcomes during study abroad, it is essential to determine which specific aspect to assess and how to monitor its development (Deardorff 2015, Fantini 2012). However, accessing direct evidence of students' learning, and monitoring development while the students are overseas, is not straightforward, especially if faculty or staff are not accompanying them.

In the midst of these challenges, ePortfolios, which are web-based and can gather artifacts of learning and reflection that focus on learning and development (Eynon & Gambino 2017), are an emerging means of assessment in international education allowing for collection and tracing of direct evidence of students' learning over time (Deardorff 2015). However, as Griffith et al. (2016) point out, a weakness of using portfolios is that no standard assessment exists which enables meaningful comparisons among groups or students' submitted work, since content, platforms, and scoring methods are different across institutions, research, and contexts. In higher education in Japan, many institutions are still struggling with the implementation of ePortfolios (Morimoto 2015), and in study abroad research, discussion of how to use ePortfolios for measurement is still scarce (Shoraku & Yoshida 2018). With the expectation that ePortfolios can assess complex learning outcomes during study abroad, research on the use of ePortfolios to systematically assess students' learning development overseas and to improve programming is needed.

In one of the few studies to examine study abroad ePortfolios in Japanese higher education, Cutting et al. (2020) analyzed students' daily reflections in ePortfolios documented abroad to see the impact of pre-departure training. The researchers employed Kirkpatrick's (2006) training evaluation framework, part of which evaluates participants' behavioral change "after" the training, so called Level 3 (Behavior) evaluation, and examined how frequently students wrote about using the target skill taught in pre-departure training.

RESEARCH DESIGN & METHODS

This research moves beyond the study of Cutting et al. (2020) to examine how the same target skill is used and how it develops over time. It also adds self-ratings from students about their use of the skill to bolster results. Then, the findings are used to discuss how to improve pre-departure training.

Research questions:

1) What does the evidence in students' ePortfolios tell us about how they use the target skill and how it develops?

2) How can we improve our pre-departure training from the evidence?

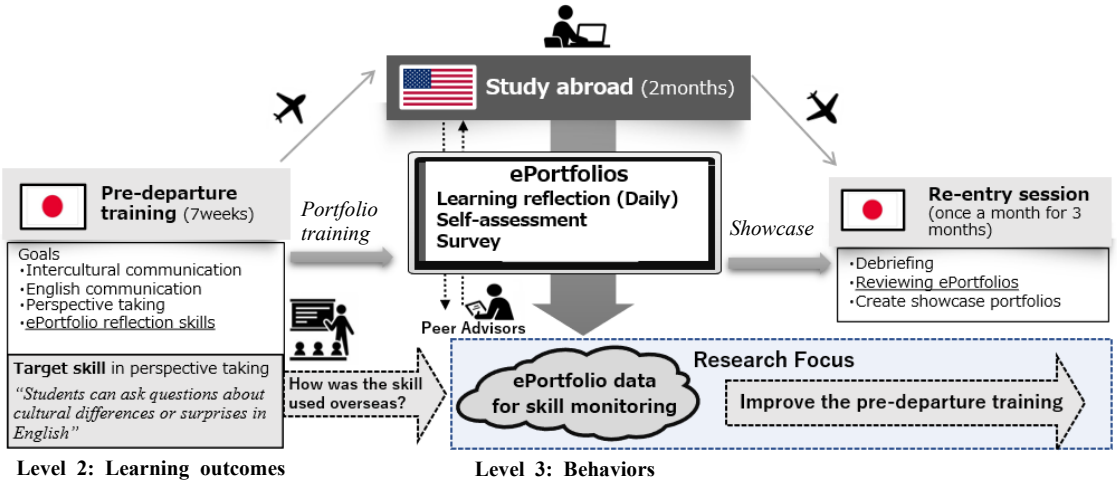


Figure 1: Design of ePortfolio Assessment for Study Abroad

PROGRAM BACKGROUND

The study is based on the same short-term study abroad program as in Cutting et al. (2020), operated in a local private university in Japan, but in the following year with different students. The program dispatches a group of Japanese students to a US institution for 2 months for credit-bearing courses. Enrollment requires completion of an intermediate English class in the home institution and students' TOEFL (itp) scores range from 440 to 480. The program aims to equip students with communication skills and intercultural competencies to work with people of diverse backgrounds in global society according to the institutional mission. The participants are 15 students (4 male and 11 female; 4 second-year and 11 third-year).

FRAMEWORK FOR MONITORING

To optimize the study abroad experience, pre-departure training (7 weeks for 14 class hours) and re-entry sessions (3 times) are provided by the first author in the home institution (Figure 1). The pre-departure training course aims to promote intercultural communication and learning while abroad based on the program goals. This includes "perspective taking," in which students learn how to step out of their ethnocentric perceptions to see others' viewpoints, and it is divided into sub-categories for practice and evaluation (Table1). The study uses the framework of Kirkpatrick's (2006) training evaluation and examines how students use what they learned from the pre-departure training while abroad. In pre-departure training, students practice each skill in Table 1 in a simulation with a TA who acts as an American buddy and their performance and attainment levels are evaluated as learning outcomes (Kirkpatrick's Level 2: Learning Outcomes). After the training, we examine if students are exercising the new skill (Kirkpatrick's Level 3: Behaviors). In this study, we focus monitoring on Skill b), due to its criticality in intercultural understanding as well as its observability (Cutting et at 2020). ***Skill b) "Students can ask questions in English about cultures, such as cultural differences or surprises."***

Table 1 "Perspective Taking" Goals divided into Attitude/Knowledge/Skills for practice and evaluation

Goal	***"Perspective Taking"*** Students possess the knowledge, attitude, skills, and English ability to attempt to broaden their perspectives.
Attitude	・Suspend own judgement of others' attitudes and behaviors. ・Being curious and inquisitive to seek understanding through observation, questioning, and researching .
Knowledge	・Students can differentiate facts, interpretation, and evaluation. (the D.I.E. method: Describe, Interpret, Evaluate).
Skills *Target skill to monitor*	a) Students can suspend their own judgement of others' attitudes and behaviors. b) **Students can ask questions in English about cultures, such as cultural differences and surprises.** (appropriately, not based on their own judgement). c) Students can explain their own views to others (appropriately) to help mutual understanding. d) Students can critically reflect and express their own views, assumption, and/or their perspective change.

(Adapted from Cutting et al. 2020)

ePORTFOLIOS

Throughout the program, ePortfolios are employed to deepen students' learning through self-reflection and to provide evidence for learning assessment. In the pre-departure course, students learn how to reflect on their experiences and why it is important. While abroad, students write daily reflections and set daily goals as a non-compulsory yet highly recommended activity (Figure 2). Upon their return, students review their ePortfolios and create showcase portfolios. Figure 2 shows an example of students' daily reflections during study abroad. The top column contains instructor's guided reflection questions with motivational messages posed daily and the second column has students' writing. The bottom column is feedback from a trained peer advisor, who was a program participant of the previous year.

【ePortfolio during study abroad】

・*What did you experience today? What did you notice or learn from the experience? Why is it important and how will you utilize it in your life?*

・*How was your achievement of the day? What is your goal tomorrow?*

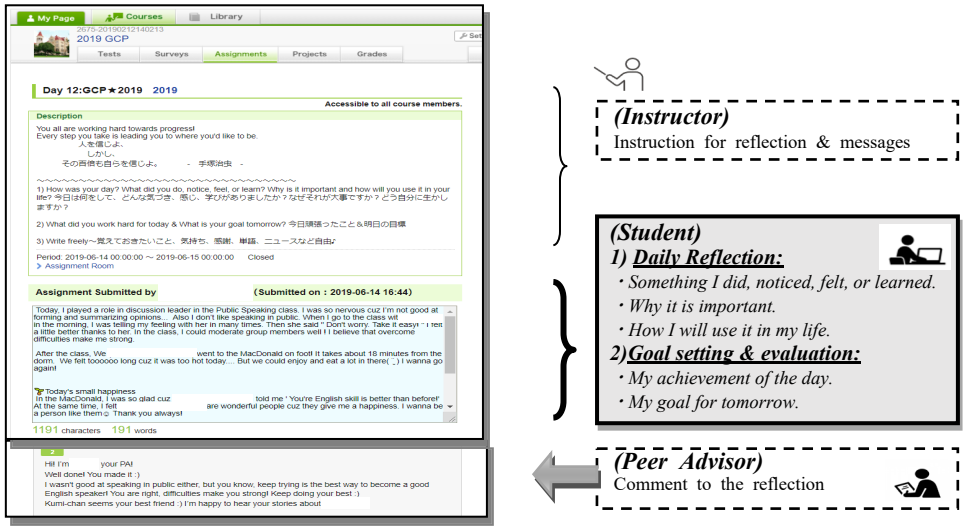


Figure 2: ePortfolios during study abroad

ePORTFOLIO ANALYSIS

The first phase of data analysis was to thoroughly read students' daily ePortfolio reflections and extract descriptions which referred to their use or intended use of the target skill following Cutting et al. (2020). This qualitative coding was conducted based on the deductive approach of Sato (2008), first by pre-

setting a code label for the target skill, and then allocating the code to segments which specified students' use or intention to use the skill (Cutting et al. 2020). A researcher in the field of international education supported the first author in extracting appropriate segments. When agreement was reached on all selected segments, we concluded that theoretical saturation had been achieved. The segments were then set in chronological order and use of the target skill over time was analyzed. 15 students' reflection entries, from days 1 to 19, were analyzed. Then from day 19 to 29, a self-rating survey which asked if they were using the skill or not was collected. The total number of entries for 15 students over 19 days were 226 entries, average of 79% submission rate per day. (The total participants was 16. However, one student who did not submit a self-rating survey was excluded from this study to align with reflection data.) Prior to this research, all participants provided written and verbal consent to make use of their ePortfolio submissions.

RESULTS

The extracted segments showing students' use or intended use of the target skill are listed, student by student, in Table 2. 8 students out of 15 (53%) wrote about using the skill, and there are 12 segments in total. While these do not represent every experience they had, their authentic contexts where the skill was used are captured in detail. First, students asked their cultural questions to their "buddies" the most, who are student volunteers at the hosting institution to support the international students. The findings signified that buddies acted as important cultural guides for international students. In addition, ePortfolios discovered other interlocutors, such as "RAs," "volunteers," and a "dorm resident." Variety of cultural questions was also documented, for example, personal observations, local recommendations, and politics.

ePortfolios importantly captured students' perspective changes and self-realizations. For example, Student C (day 19) who asked about World War II to an American dorm resident reflected on the realization of his/her narrow views. Furthermore, this student felt the need for academic vocabulary. Student D (day 11) also asked about politics and reflected on the necessity of listening skills. Although here we see students' recognition of the need for language skills in complex cultural dialogues, Byram & Golubeva (2020) claim that many models of intercultural competence "do not take account of linguistic competence" (p.74). More models of intercultural competence which integrate language aspects need to be developed. ePortfolio entries also capture students' feelings, as in "thankful," "exciting," and "frustrating" in their cultural interaction, providing additional aspects related to their learning. Griffith et al (2016) refute that existing measures in intercultural communication often do not sufficiently collect affective and behavioral evidence which are essential in viewing interactions with local hosts. These ePortfolios provide affective and behavioral evidence which are hard to capture by standard instruments.

Table 2 Extracted descriptions from ePortfolios on using the skill to "ask questions about culture"

	Students' descriptions	**context**
Student A Day 1	About cultures, I felt there are so many people who are half naked. Texas is surely hot, but Japan is …I don't know **what makes such difference**, so I will try to ask a **buddy** about it.	△**Buddy** Observation
Student A Day 7	I asked a **buddy about a kick skater**. Lots of people are riding them and I learned people can rent one after installing an application.	✓**Buddy** Observation

Student B Day 4	After class, I sent a message to a **buddy** and asked which coffee shops he recommends around school. **Since I am in the US, I felt I should explore different coffee shops** to study. …I truly respect our buddies' spirit to help. So thankful.	✓**Buddy** Local recommendation
Student B Day 14	I asked my **buddy** about **politics in the US,** because I couldn't understand the pros of the Republicans in my Multicultural Society class. He told me that …I wanna know about politics of the U.S. more and more.	✓**Buddy** Politics
Student C Day 6	(The **RA**) asked questions and asked about Japanese language to me. Using this time, I asked **the same questions** back to her and explained using drawings and photos. With these, she talked to me a lot.	✓**RA** What was asked (language)
Student C Day 19	Most shockingly, when I asked him (a **dorm resident**) about **bombing in Hiroshima**, he said American aircrafts … I wasn't taught such a thing, so later I looked into it. It seems Japan was banning people to.. World is big. My view is narrow. And topics are difficult. I really felt I need more vocabulary for academic conversation, but it was a lot of fun!	✓**Dorm resident** War
Student D Day 11	I asked (**volunteers**) about **the election in the US** which I learned in class because I wanted to see if I can talk about something academic. However, their vocabulary was difficult, and speed was fast, so it was hard to catch all. But they explained some words to me and gave various examples, so I was thankful. I still lack listening skills. I will work on it.	✓**Volunteer** Politics
Student E Day 4	Because of a comment from my teacher, I learned my gestures could give a negative image to some people. I also asked questions about **an expression I know** to a **buddy** and found out people may consider it as racist. Asking questions is surely important and I want to ask questions more.	✓**Buddy** Expression
Student F Day 7	I talked to our **buddies** on the street. Starting from "it's hot again," I kept asking questions about **whatever I saw in town**. This is my first time to stay this long overseas, so this new culture is very exciting …. My goal for the day was proactively communicating with buddies and I feel I achieved it well.	✓**Buddy** Town observation
Student G Day 10	I will write about the questions I asked to **RAs** today and what I thought about their answers. Question 1: **In the parking lot,** it seems…Question 2: **In Texas, do Republicans**….Then I heard Texas is Republican, but.... Their answers were interesting. I want to keep asking more questions from now on.	✓**RA** Observation, Politics, etc.
Student H Day 6	After the tour, some students were asking questions to **the guide** and understanding by nodding. However, I couldn't understand and felt terrible. I had lots I wanted to ask **about this organization** but not being able to understand what they say was frustrating. I have a few things I want to ask, so I will ask the staff next time I go there.	×**Guide at Volunteer site** Volunteer site
Student H Day 18	(At a volunteer site, in a freezer room) There was a foreign **volunteer** next to me and I wanted to ask various questions **about volunteering** to the person. But I was so cold that no word came from my mouth.	×**Volunteer** Volunteering

(Interlocutors and question content are highlighted. Students' reflections of their action are underlined. Japanese entries were translated into English by the first author)

Next, to explore the development of skill usage over time, we chronologically arranged the segments from day 1 to 19 (Table 3). From day 1 to day 9, students tended to ask questions about observations in town and local recommendations as in student A, B, and F. From day 10, questions about politics arose as in student B, C (war), D, and G. This progression is not rigid, but thinking of cultural learning, questions about personal observations are relatively easy to ask and "visible" part of cultures. Politics are more complicated to discuss and comprehend, thus requiring elaborate interaction. Furthermore, intricate discussions involve certain English levels. Therefore, it is not difficult to guess why political questions start to emerge later than town observations and this may show developmental stages in this skill.

Table 3 Context for skill use in chronological order (students' cultural questions and self-ratings)

	Student A	**Student B**	**Student C**	**Student D**	**Student E**	**Student F**	**Student G**	**Student H**
Day1~3	△**Buddy** ***Observation***							
Day4~6		✓**Buddy** ***Local recommendation***	✓**RA** *What was asked (language)*		✓**Buddy** *Expressions*			×**Guide at volunteer site** *Volunteer site*
Day7~9	✓**Buddy** ***Observation***					✓**Buddy** ***Observation***		
Day10~12				✓**Volunteer** ***Politics***			✓**RA** ***Observation, Politics,*** *etc.*	
Day13~15		✓**Buddy** ***Politics***						
Day16~19			✓**Dorm resident** ***War***					×**Volunteer** *Volunteering*
Day19~26	**Self-rating:** ***"I ask questions about cultures (cultural differences and/or surprises)"***							
	Strongly agree				**Somewhat agree**		**Don't agree much**	

△: Intention to use the skill, ✓: Used the skill, ×: Couldn't use the skill

SELF-RATING

From days 19 to 26, a self-rating survey with the question "I ask questions about cultures" was conducted to collect quantitative data. In Table 3, Students A, B, and C, who wrote about using the skill most frequently had the highest self-rating. Whereas, Student H, whose ePortfolio revealed no success in asking questions rated the lowest, which matches the ePortfolio evidence. The ePortfolios of Student H showed that his/her difficulty in comprehending English hindered asking cultural questions. Since Jackson (2020) states that researching "host-sojourner interaction" to identify what facilitates or hinders "intercultural communication and relationship building" is still new (pp.448-449)," this area needs to be examined further. It must also be noted that there were 7 students who did not refer to using the skill in their ePortfolios; 4 of these answered, "Strongly agree," 2 "Somewhat agree," and 1 "Don't agree much." One of the main reasons there are no such references is likely that some of these students missed submitting reflections several times, and some entries were brief and lacking detail. Therefore, ePortfolio assessment requires adequate submission as well as content, and thus motivating and encouraging students to document their learning in ePortfolios is imperative.

USE OF DATE FOR COURSE IMPROVEMENT

Lastly, we discuss how the findings help improve the program. According to Suzuki (2015), it is crucial to make the training context similar to real-life settings in order to promote learning transfer (Cutting et al 2020). To examine how much our training context resembles real situations, we compared both. In pre-departure training, students practice the target skill with a TA acting as a "Buddy" by asking questions about "things they saw" in a simulated environment. The ePortfolios revealed that interaction with "Buddies" and asking questions about "observations" are the highest frequency (Table 2), which indicate our training context matches students' real-life situations. However, ePortfolios also showed that use of the skill extended to more diverse situations and involved other interlocuters. To optimize affordances in the host environment, we will embed such elements in simulation practice in pre-departure training. As discussed earlier, cultural questioning tends to progress from simple observations to deeper topics such as politics, and English comprehension is integral in cultural discussions. This suggests that we can add levels in our simulations following this pattern and integrating advances in English.

CONCLUSION

Our study attempted to use ePortfolios to perform a systematic assessment of study abroad participants' learning, by honing in on a target skill taught during pre-departure training and monitoring and analyzing students' use of that skill during study abroad, using Kirkpatrick's framework. We then discussed how to use the findings to improve the pre-departure training. Contextualized qualitative analysis of ePortfolios revealed diverse situations where cultural questions emerged and local people engaged with, all of which expanded the scope of students' sojourn experiences. ePortfolio importantly captured students' perspective

changes and self-awareness, as well as affective and behavioral aspects in learning. Furthermore, a trend toward transition in difficulty levels in students' cultural questions was observed. The evidence suggests the pre-departure training context matches students' sojourn experience but does not sufficiently cover diverse situations and complexity levels of the context of their skill use. According to Jackson (2020), the future research should investigate intercultural discourse in study abroad in a systematic and in depth way to inform "types of interactions" students routinely engage in, "learner speech act behavior in various situations," intercultural misunderstandings and negotiation strategies (p.452), and to use the evidence to provide pre-departure training with examples of real-life scenarios. Although this study is limited by its scale and focus, we hope our examination took a step in that direction using ePortfolios.

ePortfolios enables study abroad researchers and practitioners to open the door of students' life abroad, filled with excitement, struggles, and surprises in their intercultural encounters. By having a clear focus in assessment and monitoring students' learning in a systematic way, complex evidence of learning abroad can become a rich and solid resource for improving pre-departure education and beyond.

REFERENCES

Byram, M. & Golubeva, I. (2020). Conceptualizing Intercultural (Communicative) Competence and Intercultural Citizenship. *The Routledge Handbook of Language and Intercultural Communication* (Jackson, J. ed.). Oxon: Routledge. 70-85

Cutting, M., Goda, Y., & Suzuki, K. (2020). Instructional Method and Impact of Pre-Departure Training for Study Abroad: From the Viewpoint of Transfer of Learning [In Japanese]. *Journal of Japan Association for College and University Education*, 42(1): 95-104

Deardorff, D. K. (2015). *Demystifying Outcomes Assessment for International Educators*. Sterling, VA: Stylus.

Deardorff, D.K. (2006). Identification and Assessment of Intercultural Competence as a Student Outcome of Internationalization. *Journal of Studies in International Education*, 10(3): 241-266

Eynon, B., and Gambino, L. M. (2017). *High Impact ePortfolio Practice A Catalyst For Student, Faculty, and Institutional Learning.* Sterling: Stylus Publishing, LLC.

Fantini, A.E. (2012) Multiple Strategies for Assessing Intercultural Communicative Competence. *The Routledge Handbook of Language and Intercultural Communication* (Jackson, J. ed). Oxon: Routledge. 390-406

Griffith, R. L. Wolfeld, L. Armon, B.K., Rios, J. & Liu, O.L. (2016). Assessing Intercultural Competence in Higher Education: Existing Research and Future Directions. *Research Report*, ETS RR16-25: 1-44

Jackson, J. (2020). The Language and Intercultural Dimension of Education Abroad. *The Routledge Handbook of Language and Intercultural Communication,* Oxon: Routledge.

Kirkpatrick, D. L. & Kirkpatrick, J.D. (2006). *Evaluating Training Programs.* Oakland: Berrett-Koehler Publishers, Inc.

Morimoto, Y. (2015). Educational Big Data as e-Portfolios and Learning Analytics [In Japanese]. *Computer & Education*, 38:18-27.

Salisbury, M. (2015) How We Got to Where We Are (and Aren't) in Assessing Study Abroad Learning. *Assessing Study Abroad* (Savicki, V. & Brewer, E. eds). Sterling: Stylus.

Shoraku, A. & Yoshida, M. (2018). Learning Outcomes of Overseas Studies in an Undergraduate Program [In Japanese]. *Kobe Journal of Higher Education*, 26: 59-78.

Suskie, L. A. (2018). *Assessing Student Learning: A Common Sense Guide.* San Francisco: Jossey-Bass.

Suzuki, K. (2015). *Kenshu Sekkei Manual* [Training design manual-translation]. Kyoto: Kitaoji-shobo.

Vande Berg, M. P., Paige, R. M., & Lou, K. H. (2012). *Student Learning Abroad.* Sterling: Stylus Publishing LLC.

Improving Students' participation and collaboration with adjusting CLOUD education platform during the real-time interactive class

Minchul Shin
minchul0582@gmail.com
Teacher
Jinwol Elementary School
Daegu, South Korea

Wooyong, Eom
wyeom2@gmail.com
Professor
Keimyung Univ.
Daegu, South Korea

The purpose of this study was to find a way to promote the collaboration and interaction of students and bring about the growth of learners through feedback while taking advantage of real-time interactive class via video conferencing tools. Although real-time interactive class with using video conferencing tools has great advantages, but there were also limitations of active interaction. To this end, real-time interactive tool and cloud-based educational platform were applied to create cases of learner participation classes and analyze the cases. Through this, the application of the cloud-based educational platform in real-time interactive class could lead students to participate and collaborate even in non-face-to-face situations.

Key words: Remote Class, Real-time interactive lesson, Cloud-based educational platform

INTRODUCTION

Due to the situation caused by COVID-19, the current education system has entered the era of un-contact. In the non-face-to-face situation caused by the virus, the system at the school was also converted to online, and students' learning activities were also changed to full online learning situations. In this situation, the Ministry of Education of the Republic of Korea presented three class examples: content utilization-based classes, task performance-based classes, and real-time interactive classes.

Looking at the main types of remote classes in the subject class, 40.9% of the above examples used Content utilization-based class type, 10.6% of tasks performance-based class type, and 5.2% of real-time interactive class type. When looking at the case of combining two or more class types, 82.1% of them combined task-oriented class and content utilization-based class, 7.1% of them combined content-utilization-based class and real-time interactive class, and mixed all three was 6.9% of cases. It was found that 3.9% linked task performance-based and real-time interactive class. Therefore, it was confirmed that the real-time interactive class type was operated at the smallest rate.[1]

Real-time interactive class means a class that takes the form of a video lecture or a remote video lecture. Video lecture or remote video lecture is called the term video conferencing, and originally refers to a technology that enables real-time interactive communication in different places (Gillies, 2008; Motamedi, 2001; Spodick, 1995; Strijbos, 2003). Among the three types of classes presented by the Ministry of Education of Korea, real-time interactive class which is utilizing video teleconferencing platforms such as Google Meet, Zoom, and MS Teams is the only way to have a class

[1] Jinsuk Kim (2020). Corona19 Response Distance Education Achievements and Challenges. *Proceedings of the Korea IT Service Association Conference* 462-471

with seeing each other's face. Video lectures allow for two-way communication by connecting geographically distant places at the same time (Thatch & Murphy, 1995), and utilizes a variety of information such as voice, graphics, and video to face existing face-to-face in remote education situations. The educational potential has been evaluated in that it has similar educational effects to the class (Jung In-sung, Na Il-Joo, 2004).

The educational effects of remote video lectures are as follows. First, a video lecture provides a learner with a scene in which video and sound are effectively combined, giving the learner the feeling that they are actually taking lessons in the classroom. It has the effect of enhancing the "social presence" through social interactions in which exchange of active information and opinions takes place immediately (Hrastinski, 2008; Lombard & Ditton, 1997). Second, video lectures enrich the contents of the class by promoting the sharing of diverse backgrounds, experiences, and perspectives of students (In-Ae Kang, 1996; Mejia, Meraz, 2011). In addition, it is possible to promote various team activities of learners in that the "co-operation" and "cooperation" of learners are effectively promoted in an environment similar to the actual situation (Strijbos, 2007). Therefore, it can be seen that the remote video lecture is a teaching and learning method that promotes the learner's interaction in an emotional situation that is most similar to classroom instruction in a non-face-to-face learning situation due to COVID-19.

However, the video lecture basically shows limitations due to the characteristic that the instructor and the learner are separated in different spaces (Lim Cheol-il, 2011; Anderson, 2003). In fact, when effective two-way communication is not promoted, the effect of video lectures must be drastically reduced, so immediate feedback and careful attention of the facilitator to promote two-way communication are required (Lee Dong-ju, Chul-il Lim, Jung-hoon Lim, 2009; Canning, 1999; Willis , 1993). In particular, due to the sudden on-line schooling due to COVID-19, this effective two-way communication faced a situational limitation that is difficult to achieve in a class that is conducted for a large number of students who have not had distance learning training using video conferencing tools. For this reason, one-way knowledge transfer classes through screen sharing by one teacher, rather than classes based on communication and interaction expected when connecting students in real-time video, are often conducted.

Educational effectiveness in distance education depends on how meaningfully the learners interact in a spatially and temporally separated state (Carr & Duchastel, 1997; Webb, 1997; Anderson & Rourke, 2005). In order to effectively conduct real-time interactive class, it is necessary to think about how to engage students and engage in collaboration. Therefore, in this study, we tried to find an effective distance education method by combining cloud tools with remote video lectures with the advantage of actively attracting the participation of various people (students, teachers, and parents) participating in the curriculum. To this end, G Suite For Education and Mentimeter, which are cloud-based educational platforms used in the school, are selected and applied to real-time interactive class together, while utilizing the advantages of real-time interactive-oriented classes to promote students' collaboration and interaction and feedback. We tried to create a case that promotes learners' learning through and examine its effectiveness.

RESEARCH METHODS

The goal of this study is to create a case where communication and interaction can be made by applying a cloud-based educational platform together in a real-time interactive center class using a video conferencing platform, and to obtain implications through this. Therefore, we created a class case that applied real-time interacrtive class with video conferencing and applied the office tools of G Suite For Education, a cloud-based education platform, and Mentimeter, an interactive presentation.

[Case1] Society Class – Barrier Free learning project

- -Overview of the class: Barrier-free class is a part of education for people with disabilities to learn about places and facilities where people with disabilities are difficult to go to and how to improve them. The key to this lesson is to brainstorm the places where people with disabilities are difficult to go and to think about how to change those places, then compose and present ideas on how to change those places.

- Tools: Google Meet, Mentimeter, Google Classroom, Google Docs

- Composition and stage of class

Stage		Content	Tools	Combination with Video Conferencing tool
Introduction		Brainstorming places for people with disabilities to go	Google Meet Mentimeter	-Gathering Ideas with Mentimeter Word Cloud
Development	Activity1	Share ideas on how to change existing locations for people with disabilities	Google Meet Mentimeter	-Share the ideas with Mentimeter Open Ended
	Activity2	Organize your ideas, read ideas from other friends, and give feedback through comments	Google Meet Google Docs	-Sharing and gathering the ideas with Google Docs
Summary		Take a look at the final result and organize what you learned today with the Quiz	Google Meet Mentimeter	-Check the understanding with Mentimeter Quiz

- Effects of Class
  1) 1) Students participated in classes rather than classes focused on knowledge transfer, allowing students to express their ideas freely.
  2) 2) By seeing each other's ideas together and providing feedback, it was possible to further refine the ideas of turning facilities that are not accessible to people with disabilities into a disabled environment..
  3) 3) Because the contents of each student's activities are visually visible, students were able to actively participate in classes based on high concentration.
- Video link of class: https://bit.ly/2ZYH2jq

[Case 2] Art Class – Drawing Kandinsky abstraction

- Overview of the class: This class is to learn about Kandinsky's hot abstraction, learn the elements of hot abstraction, and draw his own abstraction. The key is to share your drawing process through video lessons, create your own work manual through Google presentations, introduce your work, and share your work with friends.

- Tools: Google Meet, YouTube, Google Slides(Presentation), Google Survey

- Composition and stage of class

Stage		Content	Tools	Combination with Video Conferencing tool
Introduction		Learning about Kandinsky's hot abstractions and abstractions	Google Meet YouTube	-Watching YouTube resource
Development	Activity1	Envision and draw your	Google	- Sharing

		own hot abstract artwork	Meet Grid View	artwork activities via camera
	Activity2	Create an introduction paper about artwork and view other friends' artwork with feedback.	Google Meet Google Slides & Survey	-Create and share artwork with Google Slide -Evaluate and feedback mutual works with Google Survey
Summary		Leave a testimony of class participation	Google Meet Google Classroom	-Leave class comments in the Google Classroom

- Effects of Class
  1) Rather than simply drawing art, It was able to write and organize the description of the work through Google Slides..
  2) It was able to share each other's impressions through the Google Slides collaboration.
  3) It was possible to grow through the systematic appreciation and feedback of works by allowing mutual evaluation and feedback through Google Survey.

- Video link of class: https://bit.ly/3jD5T4e

[Case 3] Society Class – Find out what you can do to protect child rights

- -Overview of the class: This is a class to learn about the current state of child rights protection and to directly make a law for children by becoming a member of the Child Human Rights Commission. This class took place with half of the students at home and half of the students taking classes at school, and used video conferencing tool to overcome the physical separation between the two groups of students. Also, using Google Docs and Mentimeter to share each other's methods, share ideas, and create classes together is the core of this class.

- Tools: Google Meet, YouTube, Google Docs, Mentimeter

- Composition and stage of class

Stage		Content	Tools	Combination with Video Conferencing tool
Introduction		Watch a video on the realities of child human rights protection and learn about the problems children face in human rights	Google Meet YouTube Mentimeter	-Watching YouTube resource - Write down
Development	Activity1	Creating a law that can address child rights protection	Google Meet Google Docs	- Write and share ideas with Google Docs
	Activity2	Find out what we can do to protect child rights	Google Meet Mentimeter	-Create and share ideas with Mentimeter
Summary		Take a look at the final result and	Google Meet Mentimeter	-Check the understanding

	organize what you learned today with the Quiz		with Mentimeter Quiz

- Effects of Class
  1) It was able to participate in the same class together regardless of the physically separate learning environment.
  2) Through collaboration between Google Docs and Mentimeter, they were able to gather ideas and send and receive feedback

- Video link of class: https://bit.ly/2WZuJS2

RESULTS

In order to examine the effectiveness of this study, an interview was conducted with 7 students who participated in this class. First, It was able to see the thoughts and activities of my friends in real time, so It help students to became more focused. Second, it was fun to be able to make results with friends. Third, even though the space was apart, Students felt like taking classes together. Fourth, it was good to see the results of the learning activities.

From the teacher's point of view, the following advantages were confirmed by using a cloud-based educational platform in a real-time interactive class situation. First, it was possible to express each other's thoughts and opinions in a video class where a large number of people participated. Second, it was possible to check the learning outcomes of each other and to send and receive feedback. Third, because the real-time interaction class was visually displayed, the student's learning deviation was less. Fourth, it was possible to develop the same class as offline even in a physically separated online learning environment. Fifth, mutual evaluation and formation evaluation could be done together in the course of the class.

The convergence of real-time interactive class tools and cloud tools has been able to draw students' participation and collaboration in non-face-to-face situations, and it can be seen that it is very helpful in creating learner-centered educational activities based on communication and interaction with students. there was. Therefore, through these results, it could be judged that the learners were able to make meaningful interactions during the real-time interactive class.

REFERENCES

Jinsuk Kim (2020). Corona19 Response Distance Education Achievements and Challenges. *Proceedings of the Korea IT Service Association Conference* 462-471

Cheolil Lim (2012). Analysis on Learners' Satisfactions of Video Conferencing in Global Engineering Education. *Journal of Engineering Education Research Vol. 15, No. 4*, 66~75

In-ae Kang(1996). Things to consider for efficient video lectures - Indiana University Graduate School Case Study. *Journal of Educational Broadcasting*, 1(2): 23-44.

Dongju Lee, Chul-il Lim, Jeonghun Lim(2009). *Distance Education Theory*. Korea Communications University Press

Insung-Jung, Il-ji Na(2004). *Understanding Distance Education (2nd Edition)*. Education and Science Press.

Chul-il Lim (2003). *Understanding of distance education and cyber education.* Education and Science Press.

Canning, R.(1999). The Use of Video-conferencing for Continuing Personal and Professional Development in Higher Education: a small-group case study. Journal of Future and Higher Education, 23(1): 117-125

Gillies, D.(2008). Students perspectives on video conferencing in teacher education at a distance. Distance Education, 29(1): 107-118.

Martin, P. M.(2007). Global videoconferencing as a tool for internationalizing our classrooms. Political Science & Politics(ps), 40(1): 116-117.

Mejia, R, M., & Meraz, J.(2011). Video conferencing: A Global Alternative for Education Majors to Learn from Their Peers. Insights to a Changing World Journal, 1: 3-9.
Moore, M. G.(1993). Three types of interaction. In K. Harry, M. John & D. Keegan(eds.). Distance Education: New Perspectives. London: Routledge
Moore, M. G., & Kearsley, G.(1996). Distance Education-A systems view. Boston: Wadsworth Publishing Company
Webb, G.(1997). A Theoretical Framework for Internet Based Training at Sydney Institute of Technology, Open Training Education Network, Sydney
Strijbos, J. W., Martens, R. L., Jochems, W. M. G., & Broers, N. J.(2007). The effect of functional roles on perceived group efficiency during computer-supported collaborative learning: a matter of triangulation. Computers in Human Behavior, 23: 353-380.
Hrastinski, S.(2008). Asynchronous and Synchronous ELearning. Educause Quarterly, 31(4): 51-55.
Willis, B. (1993). Distance Education: A Practical Guide. Englewood Cliffs, NJ: Educational Technology Publications.
Suzuki, T. (2010). Media in Education and the Method. *Educ. Technol. Res.*, 16: 10-15

Global Interaction: Becoming a “good global citizen” through blended learning in an English communication class

Erin Noxon, Ed.D.
erinnoxon@gmail.com
Teacher
Sagano High School
Kyoto, Japan

Abstract: The Global Interaction course was developed as a part of the former Super Global High School program at Sagano High School. Over the past 7 years the course has developed into a blended learning class that works to engage learners through authentic activities, experience based learning, and real English communication. The class uses a variety of activities, devices, and other information and communication technology (ICT), to allow for different types of work, in two different types of classes. The class is divided into two weekly sections, one called “Speaking”, the other, “Listening”. This paper explains the background of the course and why it was designed, details the course goals and design including the method of design as a blended learning class, explains the research method for gathering data on the effectiveness of the course, and shows the results of the collected data from the most recent 3 school years. All of the course materials are available freely on the school website, which is cited within the paper.

Key words: blended learning; communicative English; experiential learning; instructional design; Japanese secondary education

INTRODUCTION

Global Interaction (GI) is a blended learning communicative English class that has been developed and taught at Sagano High School in Kyoto, Japan. In 2014, Sagano was designated as a Super Global High School and as a result, a new course of study was started at the school (MEXT, 2014). Called the Kyoto Global Studies program, this program was designed to foster future global leaders (Sagano High School, 2020b). GI was developed over the course of the 5 years of the SGH designation in order to achieve this goal. It became very apparent early on that the class should be developed more as a blended learning class as ICT was very much needed as a part of the course and, over the course of the past seven years, the class has become an effective course-level blended learning environment and had become a touchstone of the Kyoto Global Studies program at the school, even after the end of the SGH program. All first year students in the regular and Cosmos joint course program take the course, totaling 240 students a year (Sagano High School, 2020b).

The overall goal of the course is for students to investigate what it means to be a good global citizen. Through the progress of the course elements over the year, they focus on better understanding their own identities and expand that process into learning more about Japan in order to be able to better talk about their own country with people from other countries. They then learn about Singapore, which is the country all of the first year Sagano students visit for their school trip in January. Finally, the course ends as they reflect upon the new relationships they have made with their new friends from different countries over the course of the year, and they have discussions on racism, tolerance, and diversity.

In this paper I will briefly discuss the course elements and design, and then discuss how we, the teachers of the course, collect data to help the course to become a more effective class year by year.

COURSE DESIGN

The course is designed with an overall goal question for the students to better focus their learning. This question is, 'What does it mean to be a good global citizen?' Over the course of the year, the students explore various concepts and ideas to arrive at their own answer for the question. Initially, we focused on the idea of just being a "global citizen", but in the early years of the course, we began to blend the curriculum and added a digital citizenship component. The International Society for Technology in Education's (ISTE) standards on technology for students contain an entire section on digital citizenship and it is considered to be an important part of any ICT-using curriculum. It states that a good digital citizen uses technology in a conscientious way, uses information responsibly, and works to keep a good attitude for learning while using technology (International Society for Technology in Education, 2007). We reflected on the fact that a digital citizen or a global citizen is just a member of that society, but that we wanted the students to be "good" or "responsible" citizens, so we changed the wording.

Diversity

Next we decided on the diversity elements that we wanted to include in the course. It is widely accepted that using authentic materials in English as a foreign language (EFL) classes is an effective way to engage students in their learning, so an emphasis was placed on using authentic activities, materials, and text in the class design (Gilmore, 2007). Every student who attends Sagano has the opportunity to go to Singapore in January during their first year. Also, several times a year, groups of students from Singapore and sometimes other countries visit the school for student exchange and interaction programs. In order to prepare them for that as well as for their school trip, we created a research program where the classes break into groups and then research Singapore by choosing different topics, from general and cultural information, to sightseeing spots. They then present their findings during a poster session. We also wanted to explore ideas related to racism, tolerance, and diversity, so we designated time at the end of the year for activities related to these topics. Structuring the activities in this way allows for the students to have had positive interaction experiences, and made friends with students from other countries throughout the year, so that when they had to think about racism and discrimination, they are able to think about these things in concrete terms, having those valuable experiences with their new friends. In practice, we know that students must work on developing the knowledge, skills, as well as the attitude they need to become a better global citizen, and making friends helps them to understand that we are all human and that the world is a multicultural society (Banks, 2014).

Blended learning

As the course was created, it became apparent that in order for the students to learn and effectively express their ideas, we needed to blend the class with appropriate ICT that they could use to access and research information and also create media. This course can be considered what Bonk et al. (2005) would call a "course-level blending" (p.11). This type of blended learning refers to face-to-face learning combined with computer mediated elements. When developing curriculum at this level it should be based on technology as the backbone of the curriculum, and not just something that is thrown in randomly (Garrison & Vaughan, 2008). At this level, the technology involved is embedded into the curriculum to such an extent that, without it, the course could not function as it exists (Bonk et al., 2005). By having the course blended overall, it can be more learner-centric and

provide more peer-to-peer learning (Anderson & Henderson, 2004; Bonk et al., 2005). Also, by blending the class, we are not only helping students with developing their own self-regulation abilities by giving them exposure to working at home on smartphone and desktop apps, but also helping them to enjoy working on their assignments and increase their satisfaction and disposition towards the class, and English learning in general (Graham, 2013).

Teachers are the gatekeepers to knowledge when it comes to ICT and other learning (Salinas & Sánchez, 2009). While the goal of the class is not to teach technology, through the use of technology and the teachers modelling the effective use of technology, the students not only learn how to use the ICT, they also see how it can be an effective tool for learning and for their lives. The devices and ICT used (Chromebooks, iPads, Elllo.org and other websites, as well as G Suite) allow for many different types of work in two different types of classes.

The class is divided into two weekly sections, one called "Speaking", and the other called, "Listening". In Speaking class the goal is for the students to be continuously speaking in English. They complete a variety of projects including: poster sessions, presentations, group discussions, conversation tests, interview tests, and other activities. While working on these performance tasks using their devices, they must always be speaking in English. The Listening class is divided into three stations that the students rotate through; one a self-study speaking station using Google voice in Google Docs, the second a group study station using Google Forms and Elllo.org, and the third a teacher station where the students learn together with the teacher out of the textbook. These two types of classes will be discussed in more detail below.

Guiding questions to focus learning

Each of the three terms of the year-long class has a sub-question to guide their studies (Noxon, 2020). The first semester question is: 'Who am I and what is my place in my world?' During the first semester the students answer three guiding questions, 'Who am I?', 'What is Sagano High School?', and 'How can I tell others about myself and the world?' They answer these questions through activities such as a self-introduction show and tell presentation, another presentation that is research-based about Sagano High School, and an email assignment where they must write a practice email explaining to a university summer course coordinator who they are and ask questions about the program (Noxon, 2020).

Semester two is guided by the question: 'How can I learn more about my world and express myself within it?' During this time they follow the guiding questions: 'Why is it important that I express my opinion and how can I share my ideas?', 'What can I learn about Singapore, the country that I will visit?', and 'How can I teach people from other countries about my country?' As I stated earlier, every first year student at Sagano goes to Singapore in January for their school trip. Therefore, the second semester's goal is to keep them focused not only on broadening their perspective, but also on what they will be learning and how they should be learning in order to have a successful school trip in Singapore. A successful school trip not only means having fun, but also creating new relationships with the students they meet and navigating the all-English environment of Singapore successfully. In this semester the students learn through spontaneous debate and discussion sessions, poster sessions, and large-scale presentation making (Noxon, 2020).

Finally, in semester three, the question is 'Who will I be in the bigger world in the future?' The guiding unit questions are 'How can I maintain my network of connections all around the world?', 'How can I expand

what I know about the world around me?', and 'How will I be a Global Citizen now and in the future?' In this last semester they learn about racism, discrimination, and tolerance, they learn about emailing people in other countries, about problem solving, and finally, they explain their answer to the class question and how they will be good global citizens in the future. This semester includes another email assignment, lectures and debates on global issues, as well as a poster session (Noxon, 2020).

Speaking and Listening classes

Throughout the course of the year, these guiding questions move the learning forward through the framework of the class. The class meets twice a week in two sessions. One session is called "Speaking class", the other, "Listening class".

Speaking Class includes multiple elements but is predominantly designed as a project based learning experience, including performance tasks such as: presentations, poster sessions, speeches, conversation tests, interview tests, specific cloud-based tasks (email, Google Forms, Google Classroom, etc), racism and tolerance lectures and discussions, and lectures, interviews, and discussions with special guests. All of these activities are dependent on the ICT that is embedded within the class. Each student uses a Chromebook device, on which they access Google Drive, Classroom, Slides, Docs, Drawings, and Sheets. Using these tools in various ways, they move through and complete the elements of the class over the course of the school year.

Listening Class is divided into three stations. During one class period (50 minutes) the students rotate through all three stations. The first station is the 'teacher station'. This station is, as the name suggests, led by the teacher. The students study from the Oxford University Press' "Passport 2" textbook. This textbook was chosen because each chapter includes real world examples for Japanese students, from going through airport immigration when entering a country, to how to ask for help in another country, and also how to explain when you have an injury while travelling (Buckingham & Lansford, 2010). By using real world stories, the students can learn new vocabulary and knowledge while feeling that it is important for them, and also many of the topics are connected to their class trip (Gilmore, 2007). The second station is a speaking practice station where students can practice speaking and pronunciation by using Google Docs and Google voice typing. The students are sent a template document on Google Classroom. During the 15 minutes at the station, the students open the document, turn on Google voice typing, and then read the practice sentences on the document to fill in the blank spaces with their voice typed text. At first the students are often frustrated with the fact that Google voice typing doesn't always understand the words they are trying to say, but they work to get better at it as time goes on. Finally, the third station is the listening practice station which features videos from Elllo.org. These videos feature English speakers from many different countries, speaking in a variety of different accents. The students, while listening to and watching the videos, complete a cloze activity and answer questions about the video on a Google Form.

Within the Listening class time we also arrange for various exchange interactions for the students. In past years they have met students from Singapore, Indonesia, Taiwan, Korea, the United States, and other countries. These chances give them an opportunity to not only practice their listening and speaking in an authentic setting, but also to meet other people their own age, and speak as friends.

All of these elements together form the basis of the course. The full scope and sequence including all of the worksheets designed for the course as well as the method of teaching each unit can be found on the Sagano High School website (Noxon, 2020; Sagano High School, 2020a).

RESEARCH DESIGN & METHODS

In order to gather data as to the experiences of the students over the course of the year and to assess if the students were learning as the course was intended to guide them, we administer surveys to gather information and student perceptions. From 2014-2017, only a final year-end survey was administered. However from the 2018 school year onward, a twice yearly survey has been administered, once after the first semester and once at the end of the year. This allowed us to then analyze the data for evidence of changed student perceptions over time, as well as for evidence that they were reflecting on their learning.

Finally, in order to assess if the students reached their own answers to the question, 'What does it mean to be a good global citizen?', we conduct a final poster session at the conclusion of the school year. This is designed to help them effectively evaluate their learning so that the knowledge will stay with them as they continue to learn and grow. By creating their posters through this project as an evaluation of their learning over the course of the year, they effectively work within the top two levels of Bloom's Taxonomy of Learning, "Create" and "Evaluate" (Anderson et al., 2013). As the students make their posters using Google Slides, they can reflect on their learning throughout the GI course and determine how they will use what they have learned in their future. This reflection is important as the ability of a student to critically reflect on their learning is tied to higher-order cognitive processes such as self-regulation and metacognition (Paris & Winograd, 2003).

The students have three main questions they must answer in the content of their poster session: 'What does it mean to you to be a good Global Citizen?', 'Tell us about your life in the future, and how you will be a good Global Citizen.', and 'In the future if you remember one thing from GI, what will it be, and why is that important to being a good Global Citizen?'. The expected result is that the students will effectively deliver their poster session explaining their answers related to these points.

RESULTS

We can report two types of data as results of the GI curriculum over the course of the years it has been taught. First, in regards to the student answers to the class overall question, each year all (100%) of the students successfully complete the project. After the creation of their poster, they all share their final reflections and answers to the questions during the poster session.

The following is a review of the data that has been collected over the last 2.5 years on the student survey instruments. There are multiple data points assessed, but the following questions were selected as exemplars for

this write-up. The data from the 2020 first survey has been included here as well, as the survey was just concluded. While the comparative analysis cannot be used for this course year yet as the final survey has not occurred, the data was included as a reference. The final survey for the 2020 class year will be conducted in March 2021.

Figure 1 below shows the students answers to the question 'Have you increased your interest in English?' For both full years that the survey was given, the proportion of students indicating a greater interest in English throughout the course of the year increased.

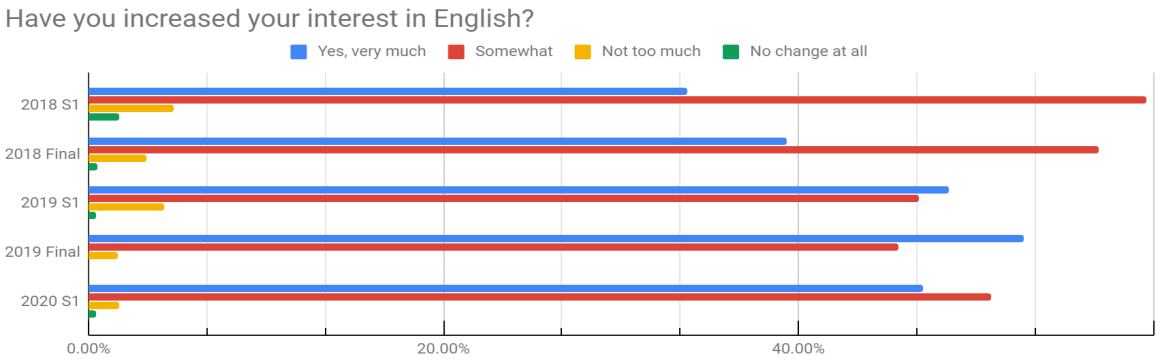


Figure 1.

Figure 2 shows the results for the students' answers to the question, 'Do you feel the voice recognition with Google Docs helped improve your pronunciation skill?". In 2018, at the beginning of the year the students felt more positively about the speaking practice activity than they did by the end of the year. In the following year, 2019, by the end of the year students were more positive about their feelings that the work helped them to improve their pronunciation skills than they had been at the beginning of the year.

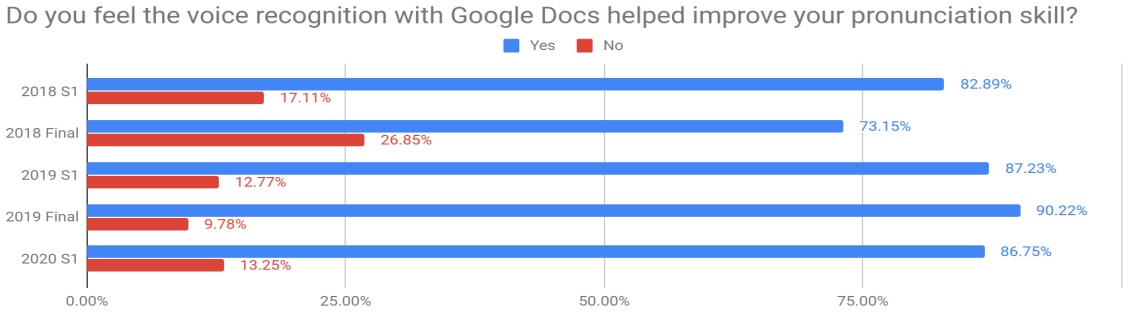


Figure 2.

Figure 3 indicates the results from the question 'Do you think you have improved your attitude in communicating in English with people from other countries?' For both years, from the beginning to the end of the year, the responses showed that students had improved attitudes in regards to communicating in English with people from other countries.

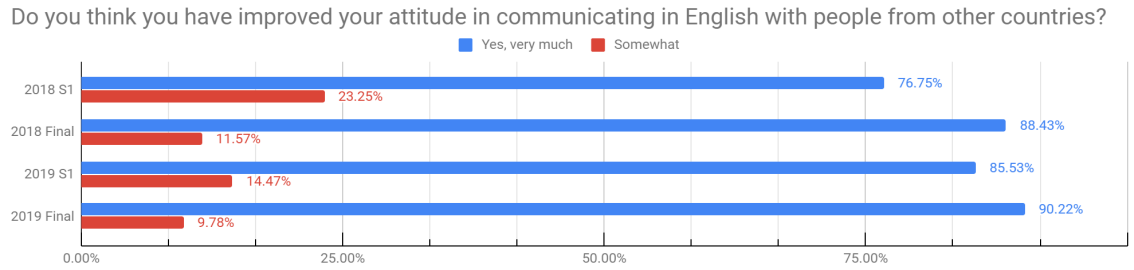


Figure 3.

Finally, Figure 4 exhibits the answer to the blended learning theme question that is asked of them at the end of the school year, 'Do you think you improved your ability to use computers by using them in GI class?' Each year so far, more than 90% of the students believe that they have improved their ability to use computers by using them in GI.

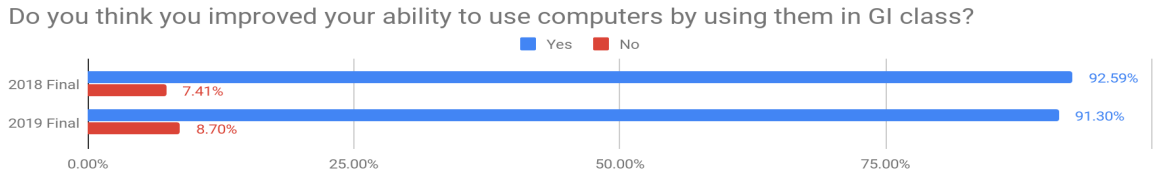


Figure 4.

CONCLUSIONS

We designed this course so that the students begin learning about themselves, then the world, and then their place within it. Through their studies on their own school, on Singapore, on Japanese culture, on racism, on tolerance, and on diversity, the students are able to develop a more inclusive and global attitude. We consider it a success that each and every student within the course completes their end of the year poster including their answers to the question, 'What does it mean to be a good global citizen?'

As for the results of the surveys, the data from Figure 1 shows that the students, through their coursework in GI, feel that they are more interested in the English language. We consider this to be a success as the goal of the class is to make them more motivated to interact with people and to use English as a communicative tool in their lives.

Figure 2 shows that in 2018 the students' perception that the voice recognition software was helping them dropped from 83% to 73% by the end of the year. Using this data, it was concluded that the activity needed to be redesigned to be more valuable for their learning and for the course as a whole. The materials were therefore adjusted to be more in line with the text and the class activities in the following year. You can see that this seems to have worked in the 2019 data as the positive perception generally remained from the beginning to the end of the year (87% to 90%). The activities will continue to be developed so that hopefully the students find the program to be effective for their learning. We look forward to the results at the end of the 2020 school year.

We were happy to notice that the students seem to have improved their attitude towards speaking in English with people from other countries, as is shown in the data within Figure 3, because this is the main goal of the diversity and inclusion part of the class design. As the year goes on and the students have more interactions

with students and people from other countries, they become more positive about communicating with people in English.

Finally, Figure 4 we feel easily shows (93% and 91%) that the students feel they learn how to use computers better through their work in GI class. Therefore, even though this is not a goal of the class, it is apparent that they are learning how to use devices through the blending of the curriculum.

The GI course will continue to evolve and be developed at Sagano High School. We hope that it can become more effective and remain relevant in our modern and changing society into the future.

REFERENCES

Anderson, L. W., Krathwohl, D. R., Airasian, P. W., Cruikshank, K. A., Mayer, R. E., Pintrich, P. R., & Wittrock, M. C. (2013). A Taxonomy for Learning, Teaching, and Assessing: Pearson New International Edition: A Revision of Bloom's Taxonomy of Educational Objectives, Abridged Edition. *Harlow: Pearson Education*.

Anderson, N., & Henderson, M. (2004). e-PD: Blended Models of Sustaining Teacher Professional Development in Digital Literacies. *E-Learning and Digital Media*, *1*(3), 383–394.

Banks, J. A. (2014). Diversity, Group Identity, and Citizenship Education in a Global Age. *Journal of Education*, *194*(3), 1–12.

Bonk, C. J., Graham, C. R., Cross, J., & Moore, M. G. (2005). The handbook of blended learning: Global perspectives. *Local Designs, Pfeiffer & Company*.

Buckingham, A., & Lansford, L. (2010). *Passport 2: English for International Communication, Second Edition* (L. Pearson (ed.)). Oxford University Press.

Garrison, R., & Vaughan, N. D. (2008). *Blended Learning in Higher Education: Framework, Principles, and Guidelines*. John Wiley & Sons.

Gilmore, A. (2007). Authentic materials and authenticity in foreign language learning. *Language Teaching*, *40*(2), 97.

Graham, C. R. (2013). Emerging practice and research in blended learning. *Handbook of Distance Education*, *3*, 333–350.

International Society for Technology in Education. (2007). *National Educational Technology Standards for Students*. ISTE (International Society for Technology in Education).

MEXT. (2014). *SGH | スーパーグローバルハイスクール (Super Global High School)・SGH*. About Super Global High School by 文部科学省, The Ministry of Education, Culture, Sports, Science and Technology. https://www.sghc.jp/en/

Noxon, E. (2020, April 1). *Y2019-20 - Global Interaction - Curriculum Scope and Sequence*. Google Docs. https://docs.google.com/document/d/1ugU1iTVPrBGi5r0-JV2LgThNHyIHraL4ld4rhG7wovc/edit

Paris, S. G., & Winograd, P. (2003). *The Role of Self-Regulated Learning in Contextual Teaching: Principles and Practices for Teacher Preparation. Office of Educational Research and Improvement (ED)*. https://pdfs.semanticscholar.org/3df1/0f57085172253813166c63fb22608774fe41.pdf

Sagano High School. (2020a, April 1). *Kyoto Prefectural Sagano High School - Regular Course/Kyoto Cosmos Course - SSH Super Science High School Designated School, UNESCO ASPnet Member School*. 京都府立嵯峨野高等学校, 普通科・京都こすもす科, SSHスーパーサイエンスハイスクール指定校, ユネスコスクール加盟校. http://www.kyoto-be.ne.jp/sagano-hs/

Sagano High School. (2020b, April 1). *京都こすもす科 共修コース（自然科学系統・人間科学系統）Kyoto Cosmos Department Joint Course (Natural Sciences/Humanities)*. Sagano High School. https://www.kyoto-be.ne.jp/sagano-hs/2-kyouikukatudou/24kyosyu.html

Salinas, A., & Sánchez, J. (2009). Digital inclusion in Chile: Internet in rural schools. *International Journal of Educational Development*, *29*(6), 573–582.

Creating Religious English Online Content Using the Successive Approximation Model (SAM)

Younglong Kim
younglong.kim@okstate.edu
Doctoral student
Oklahoma State University
Stillwater, USA

Yoonhee Shin
yoonhee.shin@dankook.ac.kr
Assistant Professor
Dankook University
Yongin, South Korea

Although research shows that religious content can be a great textbook for English as a Second Language (ESL) learners, there are few religious options in South Korea. The purpose of the project is to create religious online content for an Augmented Reality (AR) book. The Successive Approximation Model (SAM) model was selected to guide this project. Participants of this project include a project investor/content creator, instructional designers, leaners, and an ESL teacher. This project is ongoing, and the paper is expected to provide empirical descriptions of the design and development process of the product for educators.

***Keywords*:** Creating online content, Successive Approximation Mode, SAM, Religious English Content

PROJECT INTRODUCTION

There are a number of educational resources for English as a Second Language (ESL) learners in South Korea. However, there are few religious options for English education (Choe & Lee, 2014). Yoo's (2019) study shows that religious content is great for an ESL textbook because it improves vocabulary and pronunciation skills. Moreover, using religious songs makes a positive impact in improving English skills (Kim & Jang, 2020). In this project, religious songs were selected to create online content for ESL learners. In order to create an online content effectively (Cavus & Ibrahim, 2009; Kabilan, 2010) and to make it learner-centered (Bista, 2011), the SAM model was adopted to guide this project process. The purpose of the project is to create religious online content based on the SAM model and to provide empirical descriptions of each design and development process for educators, researchers, and instructional designers (ID).

SUCCESSIVE APPROXIMATION MODEL (SAM)

Creating high-quality online content is a complex process (Allen & Sites, 2012; Jones & Richey, 2000; Khan & Joshi, 2006). Among instructional design models, the Successive Approximation Model (SAM) suggests a systematic way to develop online content effectively and efficiently (Jung, Kim, Lee & Shin, 2019). It has been claimed that one of the strengths of this model is its quick design and

development process of online content whereas it needs constant checking up on the product (Jung et al., 2019). SAM emphasizes prototyping and its design process is heavily focused on the iterative process during the designing lesson (Allen & Sites, 2012; Jung et al., 2019). During the process of creating online content, the prototype could be iteratively revised (Sites & Green, 2014; Jung et al., 2019). The prototype indicates a functional sketch that allows improvement of the design through evaluation and discussion (Jones & Richey, 2000; Sites & Green, 2014). Within an interactive process, online contents can be designed, prototyped, reviewed, developed, implemented, and evaluated (Sites & Green, 2014).

THREE PHASES OF THE SAM MODEL

The SAM model contains three phases: preparation phrase, iterative design phase, and iterative development phase (Figure 1). First, during the preparation phase, information needs to be gathered such as target learners, content, learning environment, and the participants. During this phase, the Savvy Start is completed within a couple of days (Allen, 2014). At this time, potential attendees are selected and described with their responsibilities (Allen & Sites, 2012). While a number of attendees can be challenging for scheduling a meeting, having clear roles with stakeholders is crucial to manage the project (Allen, 2014). All the products coming in this phase are considered scratches for building a prototype of the iterative design phase.

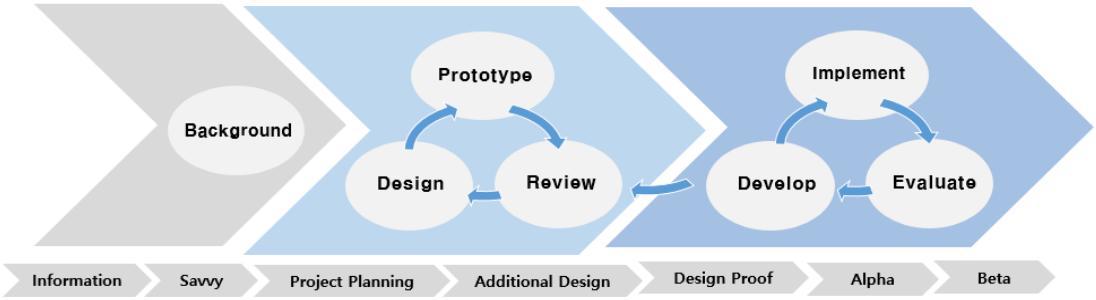


Figure 1. Process of SAM (Retrieved from Sites & Green, 2014)

Secondly, at the iterative design phase, a content creator creates the first prototype which is constantly reviewed by stakeholders. Over this project, attendees who are selected at Savvy Start join the design process by reviewing the prototype. Their feedback is reflected in the design of the online content. Once the first revision of the prototype is done, the alpha version is made. Finally, at the iterative development phase, the beta version is created based on the feedback of the alpha version. Online content is continually revised by the content creator. At this phase, the content is implemented in an English class and evaluated by stakeholders, including a large number of learners. After this, one more review on the beta version is conducted, and the feedback is reviewed and used for finalizing the gold version (Jung et al., 2019), also known as the final version.

In this approach using the SAM model, learners' perspectives are taken into consideration during the design process (Gottipati, 2018; Jung et al., 2019; Sites & Green, 2014). This is meaningful in that

learners' opinions (Bista, 2011) are considered in the design process of the content through the creation of the prototypes (Jung et al., 2019; Sites & Green, 2014).

RESEARCH DESIGN PROCESS

In this section, empirical descriptions of each design phase- preparation phrase, iterative design phase, and the iterative development phase will be described.

Preparation Phase contains information gathering and a savvy start. Information that needs to be gathered includes 1) target learners, 2) content, 3) learning environments, and 4) participants. Target learners were selected as ESL learners at the beginner level. Content was researched through open resources; based on the purpose of the project, religious songs were selected via Youtube. In order to make this content open, the learning environment needs to be easily accessible, simple and fun to attract any users. Therefore, Canva and Zappar were used as a learning environment. Canva is an online platform to design flyers, worksheets, or posts and publish them with a free option anywhere (Canva, 2020); Zappar is a platform for creating AR experience offered for a free trial. Finally, participants are selected through the savvy start.

As the savvy start, the list of the potential participants for reviewing the content was created. The role of the participants and their responsibilities were also determined. The determined roles and responsibilities are shown in Table 2. A scratch version of the content was created and recorded on Google Docs (Table 1). It was assumed that the draft and resources should be freely revised, edited and even deleted by the content creator.

Table 1. Rough Outline on Google Docs (left) & First Draft on Canva (right)

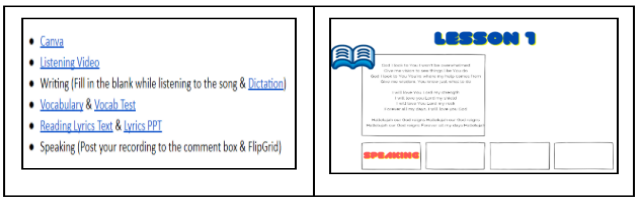
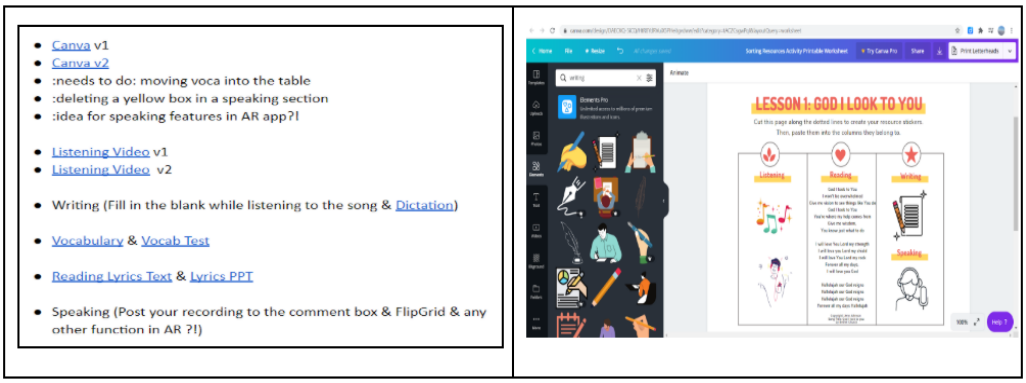


Table 2. Participants

Participants	Role & Responsibilities
Project Investor/Content Creator	Managing the project, scheduling meetings with stakeholders, and creating content
Instructional Designer (ID)	Reviewing the content and offering feedback
Prototyper/Developer	Developing the learning environment
Recent Learners	English learners (who are studying these days)
Potential Learners	English learners (beginner level)
Someone who Knows the Content (SME)	ESL teacher

Iterative Design Phrase contains project planning and additional design. At the design process, the content creator creates the first prototype which is constantly reviewed by stakeholders. In this project, the participants are Project Investor/Content Creator, Instructional Designer, Prototyper, Developer, Recent and Potential Learners, and SME. All of their feedback on the prototype was reviewed and used to design the prototype. For designing and developing the prototype version, refined outlines for learning objectives and resources for the content were used. The prototype includes learning resources containing an audio link, text-based content, and worksheet for assisting learning objectives. This work has been continuously added to and revised with more resources in Google Docs, and the resources were accumulated together with hyperlinks which allow easy access and edition (Table 3).

Table 3. Outline on Google Docs (left) & Second Draft on Canva (right)



During the design of the prototype, questions for reviewing the prototype start to be built with decision making about who will review and what draft will be shared (Table 4). There are three categories - learning content, learning activities, and learning environment in the review questions. The draft shared with reviewers contains educational resources containing a video, lyrics, and vocabulary in Korean and English. The prototype version should facilitate real experience of learning English by reviewing the content. However, the reviewers were made aware that the content was the draft, so it would be redesigned and revised based on their feedback.

Table 4. Questions for the First Review on Prototype (Revised from Shin, 2018, p. 48)

Category	Example Question	# Q	Reviewer
Learning Content	Does the learning content seem to motivate learners? (i.e., religious learning content, simple to complex designed content, etc.)	4	SME Potential Learner Instructional Designer
Learning Activities	Are the learning activities designed for learners to practice English skills? (i.e., listening, singing, checking vocabulary, etc.)	4	
Learning Environment	Is the design of the learning environment simple and clear? (i.e., technical issues; any functions for supporting learning)	4	

SME, ID, and a potential learner reviewed the prototype, and the results of the learning content, learning activities, and learning environment were all 4.0 or higher (Table 5). Among the detailed questions related to learning content, the result for items of content related to interaction with the learner was 3.67 (neutral). When summarizing the quantitative and qualitative outcomes of learning content, the prototype seems to need additional designs for assessments to measure the learning objectives. Also, the results for all sub-items related to learning activities were 4.0 or higher. However, through the comments the idea was suggested that the learner would need an opportunity to see whether they fully understand the content and instruction as their first language. This seems fair considering the level of the target learners- beginning. A simple quiz would facilitate the learning process. Finally, the results for all sub-items related to the learning environment were also 4.0 or higher.

There were suggested opinions; technical features could be added for learners to fully use every feature suggested like an online post-it board. The shared formats of the prototype were a GIF file and PDF file which were allowed to access limited resources. The format of the beta version is expected to add more features containing the Augmented Reality code and a literacy tool. Adding these features would allow learners to access every designed feature by interacting with the content. Summarizing the results for the review of the prototype, the overall score for the three evaluation items was high, but the content can be revised by clarifying the learning objectives and adding translated words and extra activities for assessment and interaction during the learning process.

Table 5. Review Results of Prototype 1

1: very poor; 2: poor; 3: neutral; 4: good; 5: very good

Category	Questions	SME	ID	Learner	Average	Opinions (Optional)
Learning Content	Does the overall content help the learning objective?	4	4	5	4.33	Adding learning objectives (ID)
	Does the learning content seem to motivate learners?	5	5	5	5.00	Highly motivated in religious content in Jesus Christ (SME, ID, Learner)
	Is the content interactive with the learner?	**4**	**3**	**4**	**3.67**	Updating some features (SME, ID, Learner)
	Was the content designed to achieve learning objectives?	4	4	5	4.33	Adding assessment like a quiz (ID, Learner)
Learning Activities	Is the instruction easy to follow the learning activities?	4	5	5	4.67	Clear and easy to understand (ID)
	Were the learning activities designed for learners to practice English skills?	5	5	3	4.33	Adding translated the lyrics (SME)
	Were the learning activities designed to achieve learning objectives?	5	3	5	4.33	Adding fill in the blank activity (SME)

	Do the learning activities motivate learners?	5	5	4	4.67	Fun and relaxing with music! (ID)
Learning Environment	Is the content easy to access?	4	5	5	4.67	Dependent on the student's level (SME)
	Is the design of the learning environment simple and clear?	5	3	5	4.33	Adding Korean instructions of features (ID)
	Is the server able to accommodate all users?	5	3	5	4.33	Easy to access (Learner)
	Does the learning environment support the learning process?	4	4	4	4.00	Adding rubrics or rewards will motivate learners to complete the activity (ID) Updating some features to access (Learner)

At Iterative Development Phase, the alpha version is made based on the first revision of the prototype. SME, Instructional Design, and Potential Learners participated in the first revision. After reviewing their feedback on the alpha version and the content is revised, and the beta version will be set up. The accepted feedback to develop the alpha version is as follows.

- adding translated instructions (Figure 2)
- adding learning objectives (Figure 3)
- adding activities or assessment to assess the learning objectives (Figure 4)
- adding activities that helps interaction between the content and the learner (Figure 4)

Figure 2. Prototype (left) and Revision for Alpha (right)

Figure 3. Prototype (left) and Revision for Alpha (right)

One of the learning activities to support interaction between the content and the learner was added as a matching up game. In this activity, learners are able to move the English word to the Korean word (Figure 4).

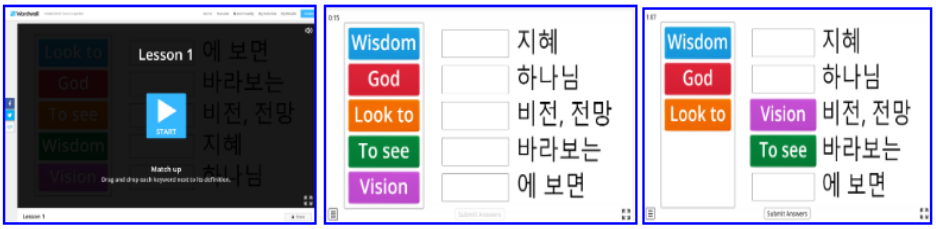


Figure 4. A Matching Game for Vocabulary by Using 'Wordwall'

CONCLUSIONS & IMPLICATIONS

This is an ongoing project being developed iteratively. Currently, the content has been developed from the scratches and prototype to the alpha version. The alpha version is being revised by adding and editing the content based on the reviewer's feedback. The content will be continuously and iteratively developed. Once the alpha version is completed, it will be reviewed again to update the content as a beta version. The format of the beta version will contain more features like AR and a literacy tool. More instructional designers and learning including recent and potential learners will be invited to review the beta version, and their feedback will be adopted for revising the beta version. After iteratively developing the beta version, there will be one more review process to finalize the content, and this will be called the gold version (Jung et al., 2019). However, even if the gold version is made, based on the SAM model, the content can be updated if necessary. The gold version is expected to be completed within this year by actually implementing it in an English class and being evaluated by the learners. The final product is expected to be used as open educational resources, so any learners can use it for free at anytime and anywhere through the internet.

REFERENCES

Allen, M. W., & Sites, R. (2012). *Leaving ADDIE for SAM: An agile model for developing the best learning experiences*. American Society for Training and Development.

Bista, K. (2011). How to Create a Learning-Centered ESL Program. *Online Submission*, *10*(31), 1-13.

Canva. (2020). Design anything. Retrieved from https://www.canva.com/

Cavus, N., & Ibrahim, D. (2009). m-Learning: An experiment in using SMS to support learning new English language words. *British journal of educational technology*, *40*(1), 78-91.

Choe, Y., & Lee, S. H. (2014). Development and Application of English Bible Study Materials: A Case of Pre-Service Christian English Teachers' Service Learning. *The Journal of the Korea Contents Association*, *14*(4), 480-490.

Gottipati, S., Shankararaman, V., & Lin, J. R. (2018). Text analytics approach to extract course improvement suggestions from students' feedback. *Research and Practice in Technology Enhanced Learning*, *13*(1), 6. 1-19.

Jones, T. S., & Richey, R. C. (2000). Rapid prototyping methodology in action: A developmental study. *Educational Technology Research and Development*, *48*(2), 63-80.

Jung, H., Kim, Y., Lee, H., & Shin, Y. (2019). Advanced instructional design for successive E-learning: Based on the successive approximation model (SAM). *International Journal on E-Learning*, *18*(2), 191-204.

Kabilan, M. K., Ahmad, N., & Abidin, M. J. Z. (2010). Facebook: An online environment for learning of English in institutions of higher education. *The Internet and higher education*, *13*(4), 179-187.

Khan, B. H., & Joshi, V. (2006). E-Learning Who, What and How. *Journal of Creative Communications*, *1*(1), 61-74.

Kim, B., & Jang, M. (2020), English Worship for Children in Korea through an English Educator's Lens view options, *Journal of Christian Education & Information Technology*, *65*(1), 145-170.

Moonyoung, Yoo. (2019). A Study on the Meaning and Collocation for Make Used in NIV English Bible, *Asia Culture Academy of Incorporated Association, 10*(3), 633-643.

Shin, Y., Kim, D., & Jung, J. (2018). The effects of representation tool (visible-annotation) types to support knowledge building in computer-supported collaborative learning. *Journal of Educational Technology & Society*, *21*(2), 98-110.

Sites, R., & Green, A. (2014). *Leaving ADDIE for SAM field guide: Guidelines and templates for developing the best learning experiences*. American Society for Training and Development.
Zappar. (2020). *Augmented, Virtual & Mixed Reality Solutions.* Retrieved from https://www.zappar.com/

Practices Implemented at a Japanese University to Sustain Educational Opportunities for First-Year Students

Shari YAMAMOTO
yamamoto-s@konan-u.ac.jp
Lecturer
Konan University
Kobe, Japan

As academic courses shift online and access to campus becomes increasingly difficult, students have less opportunities to engage in face-to-face social interaction with their peers and instructors as well as decreased chances to access university support services. The disruption caused by the coronavirus pandemic places students at risk of experiencing decreased motivation and well-being as they deal with uncertainties while coping with social distancing, restrictions in movement, and in some cases isolation away from family and friends. First-year students, transitioning from high school to university life, are particularly vulnerable as they navigate these challenges. This is a case study of the practices implemented at a Japanese university self-access learning center to sustain educational opportunities for first-year students during a time of crisis and uncertainty. The case study focuses on the interventions modifed to enhance student engagement in social interaction in a virtual learning environment. Measures taken to promote student staff training and development through distance teaching and learning will also be provided in detail. Finally, the unexpected educational benefits of student staff engagement in distance learning are explained.

Key words: Self-access learning center, First-year students, Student staff development, distance learning and teaching

INTRODUCTION

The coronavirus disease (COVID-19) has disrupted all levels of education around the world. In response to prevent the spread infection, early childhood education services to higher education institutions were closed to mitigate the global health crisis. School closures affected 1.59 billion students in 194 countries at its peak on 1 April (UNESCO, 2020). The number of students affected by school closures has decreased to 1.06 billion ss education systems implement practices to continue education resulting in more students re-engaging in education as of 19 July (UNESCO, 2019). According to a global survey conducted from 25 March to 17 April by the International Association of Universities (IAU), 454 higher education institutions in 111 countries and territories around the world reported impacts of the coronavirus crisis on such areas as campus and institutional closures, teaching and learning, international student mobility, partnerships, research, and community engagement (Marinoni, Land, Jensen, 2020). The IAU Global Survey report (2020) identified that 98% of higher education institutions reported COVID-19 affected teaching and learning. The report indicates that 67% of higher education institutions reported switching from traditional classroom teaching to distance teaching, 24% reported putting teaching and learning on hold temporarily, and 7% reported completely suspending teaching activities. On 6 April, the World Bank estimated that over 220 million students in the higher education sector, which reflects 13% of the world's student population were affected globally in 170 countries (Bassett, 2020). Survey results conducted by UNESCO Chairs around the world indicate the immediate challenges facing students in higher education, such as social isolation, internet connectivity, financial concerns, anxiety about COVID-19, information communication technology hardware, and communication with peers and teachers (IESALC, 2020). Undergraduate students and students planning to continue their education after graduating from high schools are particularly affected (IESALC, 2020).

Education in Japan has not escaped the impacts of the pandemic. In Japan, the national government issued a state of emergency on 7 April for seven prefectures (Tokyo, Osaka, Kanagawa, Chiba, Hyogo, Saitama, Fukuoka) followed by a national state of emergency declared for the entire country on 16 April. The declaration coincided with the start of the academic year in Japan; the nation follows an academic calendar beginning in April and ending in March the following year. Formal entrance ceremonies are traditionally held nationwide at schools and universities on 1 April to mark the transition from one level of education to the next. For many students, the change means leaving behind friends and a familiar educational environment and coping with anticipation and uncertainty as they prepare to enter new schools and universities that may or may not be located in neighboring school districts. Student mobility at a local level is prevalent at all levels of education, to a greater extent at secondary education level and beyond, as students are required to take exams to enter high schools and universities that match their needs and academic performance. The government declared state of emergency timed at the start of academic year created a complexity of challenges and amplified uncertainties for students, particularly students graduating from one level of education and continuing to the next level of education in Japan. Hyogo prefecture, where this case study was conducted, was among the initial seven prefectures put under the state of emergency declared by the national government. The national state of emergency was eventually lifted in stages beginning on 16 May and ending on 25 May. However, students to varying degrees remain affected by campus closures and distant learning

BACKGROUND OF STUDY

This is a case study of practices implemented at a Japanese university to sustain educational opportunities for first-year students during a time of crisis and uncertainty. The case study was conducted at Konan University, a private university in Kobe, the capital city of Hyogo prefecture, Japan. The University serves approximately 9,000 students, mainly from Hyogo and neighboring prefectures. The start of instruction for the new academic year was delayed to 20 April due to the University's need to provide emergency distance learning under the national state of emergency and urgent calls for social distancing. This led to the complete shift from in-person classes to online distance learning within roughly one month. The sudden and unexpected change placed faculty members and students at the center of teaching and learning in an unfamiliar virtual learning environment utilizing information communication technologies. In particular, first-year students were and still are vulnerable to the situation as they continue to navigate these challenges while coping with uncertainties, social distancing, and in some cases, isolation from family and friends.

Established in 2015, the University's self-access learning center is linked to a required freshman English class for first-year students. As a result, most students who utilize the self-access learning center continue to be first-year students. The link between the required freshman English class placed the self-access learning center in a unique position to reach first-year students and continue to provide learning opportunities in English and support to new members in the student community. The self-access learning center was able to design a new system and modify interventions allowing for the transition of its educational services to an online platform to sustain educational opportunities for students. The primary aims in transitioning to an online platform were to provide students with opportunities to engage in social interaction with their peers, build self-confidence towards using English, promote global perspectives, and foster a sense of belonging within the university community. In the process leading up to the transition to the online platform, numerous challenges were addressed: specifically, what types of activities could be effectively provided, how to create a safe and welcoming learning environment, how to inform students about online services and distribute activity schedules, how to keep a record of attendance for both participants and student staff, and how to provide online training and support to new and returning student staff. In addition to teachers, student staff played a key role in reaching their peers and shaping their learning experiences. This study focuses on the interventions adapted to enhance student engagement in a virtual learning environment and the measures to promote student staff training and development through distance teaching and learning.

RESEARCH DESIGN & METHODS

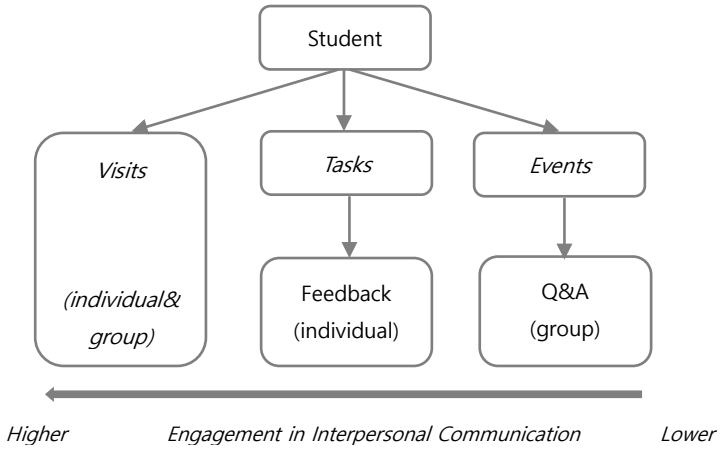
TYPES OF ACTIVITIES

How can interventions that take place in physical learning environments be modified to enhance learning in a virtual learning environment?

The transition from an on-campus learning environment to a virtual learning environment made it necessary to evaluate and identify which activities could be effectively offered online to students. Once the activities were thoroughly evaluated, it was then necessary to modify the interventions to enhance student engagement in social interaction utilizing video conferencing tools. Particular attention was given to the learning environment that supports teaching and learning, specifically, how to adapt interventions and incorporate social interaction to enhance learning in a virtually created learning environment. A brief introduction to the activities before the shift to distance learning is provided as a reference.

In-person activities. In-person learning opportunities at the University's self-access learning center are divided into three broad categories: *Visits*, *Events*, and *Tasks*. The purpose of this distinction is to provide easily identifiable pathways to help students who may or may not have strong English skills access available resources (Yamamoto, 2017). The difference also serves to promote student autonomy by placing students at the center of their learning as they choose the activities that suit their learning style, needs, and objectives (Gardner, 2011). The first intervention labeled *Visits* focuses on fostering learning that occurs through engagement in social interaction with peers. The intervention incorporates the use of games and activities and is facilitated by student staff to encourage interaction and communication in English between students. The second intervention, referred to as *Events*, centers on promoting peer learning and growth through teacher-led or student-led presentations in English. Student staff are encouraged to share their international study abroad experiences, English language study tips, and other special interest topics with their peers. As part of the activity, question and answer sessions are incorporated after the presentation to encourage audience participation. The third intervention labeled *Tasks* relies on worksheet-based resources to promote study skills and autonomous learning. In addition to the worksheet activity, students engage in dialogue focusing on the worksheet with teachers or students and student staff as a springboard to deeper learning. Within each broad category of interventions are varied resources and activities that offer expanded learning opportunities for students. The in-person activities available in the physical learning environment provide students with options to choose from and opportunities to make decisions that impact their learning (Bonwell and Eisen, 1991). These interventions combined with the support provided by teachers and student staff help create an in-person learning environment that promotes students' sense of autonomy, competence, and relatedness based on the Self-Development Theory developed by Edward Deci and Richard Ryan (Yamamoto, 2020). Figure 1 illustrates the types of interventions and the degree of interpersonal communication that can generally be

Figure 1: Autonomy Supportive & Relatedness Focused Interventions



expected for each type of learning activity at the University's self-access learning center. The following terms in-person *Visits* and *Events* and online *Visits* and *Events* have been adopted for this paper to differentiate the interventions conducted in the physical learning environment and the virtual learning environment.

Online activities. In-person *Visits* and *Events* were selected and subsequently modified from its original form to suit an online platform provided by Zoom video communications. In-person *Tasks*, however, were suspended due to concerns of effectively providing one-to-one feedback to students in a virtual learning environment. In-person *Visits* were transformed from groups of students participating in informal social interaction to individual students engaging in shorter and more structured teacher-led learning activities supported by student staff. The structure of online *Visits* was created in collaboration with teachers from the University's Institute for Language and Culture (KILC). The same team of teachers spearheaded the development of themes and content of these activities. The length of online *Visits* was shortened from 60 minutes to 30 minutes for multiple reasons including limited resources. Compared to online *Visits*, online *Events* needed less modification from its original form. Similar to in-person *Events*, presentations were mainly led by student staff and utilized the Zoom Share Screen feature to share presentation slides with students. Student staff were encouraged to explore various ways of making their presentations interactive to enhance student participation in the new learning environment. Both online *Visits* and *Events* were modified and utilized the Zoom Breakout Room feature to create a main session and smaller group sessions in the virtual learning environment. Incorporating the use of different features made it possible to switch from a main group session to a number of small group sessions in the virtual learning space, thus allowing for varying degrees of social interaction between students. Both interventions also utilized the Zoom Chat feature to conduct quizzes and share questions, which served to promote communication between teachers, student staff, and students.

STUDENT STAFF DEVELOPMENT

How can student staff development be promoted through distance teaching and learning?

Student staff. The University's self-access center relies on a core group of student staff to reach out to students in the university community and encourage peer learning. For this reason, a diverse group of students, many who have study abroad experience, are recruited each semester based on their strong communication skills in English, interpersonal skills, and motivation to help their peers. They serve as role models for younger students and are the key to providing robust student-centered learning opportunities at the self-access learning center. The student staff team that contributed to online activities is comprised of 13 recruits and 12 returning student staff. Many of the student staff are third-year students (48%), followed by second-year students (24%), fourth-year students (24%), and one graduate student (4%). Undergraduates are enrolled in the faculties of Letters (54%), Economics (17%), Business Administration (13%), Intelligence and Informatics (8%), Law (4%), and the School of Management (4%). The majority of students have study abroad experience or some overseas experience (75%). More female students (60%) than male students (40%) comprise the team of student staff.

Team building. Conducting online activities in an unfamiliar virtual learning environment made it necessary to create teams to ensure that student staff had sufficient support and could rely on each other's strengths. Each team comprised at least one student who had experience working in-person at the self-access learning center. Students with stronger English language skills were matched with peers with weaker language skills. Students with stronger interpersonal communication skills were teamed with students who possessed weaker interpersonal communication skills. Students with weak internet connectivity or hardware problems were matched with students who had stable internet connections, and so on. Special attention was paid to building teams of diverse students who could grow and develop skills from working as a team. An online survey was conducted to identify student preferences and problems and received responses from 24 student staff. According to survey results, more students indicated a strong willingness to lead online activities (79%) than students who did not. A slightly larger percentage of students (88%) showed a strong willingness to assist in online activities. Almost all students (96%) indicated that they had access to the internet. A large proportion of students intended to use computers (83%), while an equal number of students indicated that they were planning to facilitate activities using

smartphones (8%) and tablet devices (8%). The information gathered in the online survey was used to create teams of students who would work together online for peer support and peer mentoring. Team building activities *per se* were not provided online due to the sudden shift to distance learning. However, observations indicate that student staff teams who were able to work together cooperatively and bond as a team were more likely to promote a positive learning environment for students who participated in online activities.

Student staff training and development. Under normal circumstances, new student staff participate in in-person training sessions held at the beginning of each semester at the self-access learning center. The objective of these training sessions is to familiarize students with the types of interventions at the self-access learning center, their responsibilities, and their role in the learning environment. This year, due to campus closures and the shift to distance learning, it was necessary to create a pilot approach to online student staff training and development. Utilizing the University's communication infrastructure, a virtual space was created to share announcements and consolidate staff development materials such as training videos and progress reports. As part of the online orientation for new student staff, training videos were made by teachers and instructed student staff about how to facilitate interactive activities. Group orientation sessions and individual follow-up sessions were conducted utilizing video conferencing tools. Students received additional guidance on supporting students' sense of autonomy, competence, and relatedness based on the self-determination theory (Deci and Ryan, 1985, 2000). Training workshops and a supplemental tutorial video were provided in parallel to instruct student staff on how to run Zoom meetings, manage Breakout rooms, and utilize various features to conduct online activities. An ongoing progress report that could be accessed remotely by both student staff and teachers helped to keep students on task and monitor students' progress. Online survey forms completed by student staff were used to identify possible internet connectivity problems, readiness to lead activities, student scheduling, and other concerns. In addition to online training orientations and workshops, training occurred on-the-job; namely, student staff developed skills by observing other team member's presentations and interactions with students participating in the activity and by trial and error. It is interesting to note that three out of five students who initially indicated they did not want to lead activities, felt comfortable leading presentations after supporting team members for several weeks. The remaining two students later decided to postpone working as student staff due to job hunting activities. Observations fiind that working in teams leads to substantial growth and development for student staff. Further observations indicate that number of new presentations and the overall quality of interactive presentations conducted by student staff increased over the ten-week period.

RESULTS

Online activities were conducted utilizing Zoom video communications, a web-based video conferencing application, from 11 May to 17 July. Over ten weeks, a total of 140 online *Visits* and *Events* were provided. A minimum of two 30-minute activities to a maximum of four 30-minute online activities were provided daily from Monday through Friday. Students participated in online activities a total of 1,754 times. First-year students enrolled in the required English course linked to the self-access learning center were given priority. They received information about online activities directly from their English class instructor through the University's communication infrastructure system. As a result, 98% of the online activities were accessed by first-year students. Student participation in online activities by faculties are provided as follows: Letters (29%), Law (25%), Business Administration (23%), Economics (16%), and Science related faculties (7%). Students were asked to access and complete an online survey after participating in each online activity for attendance and feedback purposes. The online survey also included a set of required questions to prompt student reflection on the activity based on thinking routines (Ritchhart, Church, and Morrison, 2011). The survey results show that 71% of first-year students participated because it was required for class.

Student satisfaction of their online learning experience was gauged by the following item, "The activity was a good influence on me." (It is worth noting the English translation does not adequately capture the same meaning in Japanese.) A significant 70% of students reported that they strongly agreed, and 30% responded that they agreed with this statement. A small number of responses indicated that some students did not think that the activity was a good influence: more specifically, seven students reported that they

did not agree, and one student strongly disagreed with the statement. Survey results indicate that 82% of students who participated in online activities chose to participate in online *Events* compared to 18% of students who chose to participate in online *Visits*. Similar to the in-person activities, the large majority of students preferred to participate in online activities facilitated by student staff. Although an overwhelming number of students chose to participate in online *Events*, the survey results show that a greater percentage of students who participated in online *Visits* reported that they strongly agreed (78%) that the activity was a good influence on them compared to students who participated in online *Events* (68%). A possible explanation may be the smaller numbers of students participating in online *Visits*, allowing for more individualized attention and interaction between students, teachers, and student staff. Student responses indicate that the modified interventions and support from teachers and student staff are effective ways to promote students' positive learning experiences in the virtual learning environment.

Finally, in addition to survey items that were required, students were given the option of providing constructive comments and feedback to student staff. The item was included in the survey to periodically share with student staff as a way to sustain their motivation and enthusiasm for leading online activities. Out of 1,754 survey responses, student staff received 1,376 messages from students who participated in online activities. Responses from students who did not provide consent were eliminated, and the remaining 1,252 responses were categorized. Responses (translated from Japanese to English) ranged from "thank you," "it was fun," and "I want to join again" to more detailed and personalized responses. Based on student feedback and comments, unexpected impacts of student staff on students' learning

Table 1. Positive impacts of student staff on students' learning experience

Motivation to improve English skills	"When I heard you talking in English, it seemed to be a lot of fun. I became more and more motivated to be able to speak English like you."
	"Even though we are both university students, the seniors had very beautiful English pronunciation, and I thought it was cool to speak fluently!!! I want to be able to speak like you by the time I graduate!"
	"I'm not good at English, so I wondered if I would be able to participate in the activity. However, I saw the assistants communicating in English in a fun way, and I wanted to be able to speak English too. Thank you very much for the inspiration."
Attitude shift towards learning English	"I felt that my awareness of English has changed. I want to practice reading English at home!"
	"When I go to LOFT and listen, my attitude towards studying English changes!! Thank you for always having fun. I want to go again!!!"
	"I couldn't understand what was being said most of the time, but this lesson made me want to be able to speak English. I want to do my best little by little."
Sense of inspiration and courage	"It made me think again about life!!! From now on, I want to do the things that I want to do! I want to try to do things! I want to become a person who can continue to take on challenges in life! It was fun this time too! Thank you very much."
	"I participated this time because the title of the event was appealing to me. My motivation decreased when I had to stay at home due to the coronavirus, and it took all of my energy just to complete my assignments. I was glad to participate because I felt like I want to be able to speak English fluently like LOFT assistants. I will try to incorporate the study methods recommended this time as well." □
	"Everyone was very positive and cheerful, even in this situation. It gave me courage…"
Motivation to study abroad	"I had been vaguely thinking that I would like to study abroad, but now it has changed to be realistic!"
	"I also want to study abroad and become able to speak English!"
	"It was a short time, but it was a lot of fun to hear my seniors' experiences. My motivation to study abroad has also increased. Thank you very much."
Connection with peers	"It was a new experience because it was my first time interacting with other students in the breakout room."
	"Through this activity, I feel that I am a little more accustomed to speaking and listening to English. It was a lot of fun to get to know other people and express my opinions. Thank you very much."
	"I learned a lot from the reactions and questions when others were talking. I want to continue to participate in LOFT activities."
Sense of excitement toward university life	"I was worried about university life because I had only been to university for a day. I was more excited to attend university by participating in this event."
	"Thank you for today. I wasn't able to meet face-to-face because of the coronavirus, but I'm waiting for the day that I'll be able to learn in-person." □
	"Everyone was so kind and fun! At first, I was very nervous, but I thought it was very easy to participate because it was on Zoom! I really want to go to LOFT and join activities again in the fall semester."

experiences emerged. The six themes that were identified are listed together with student responses in Table 1. Student responses indicate that many students regarded student staff as role models and were therefore able to influence younger students positively. Responses suggests that as a result of interaction with student staff, a substantial number of students were motivated to improve their English language skills and study abroad or visit other countries. Student staff were also able to foster a change in students' attitudes toward learning English, instill a sense of inspiration and courage, and a sense of excitement about university life. For many students, online activities provided opportunities to engage in social interaction with peers during a time of uncertainty and social distancing. Furthermore, student staff played a key role in promoting meaningful learning experiences for students.

The practices detailed in this study are provided to share the experiences of a self-access learning center's efforts to sustain educational opportunities for first-year students during the coronavirus pandemic. Online activities provided to students were the result of collaborative efforts of teachers from the Konan Institution for Language and Culture, the Konan International Exchange Center, and the Center for Education in General Studies. The contributions of student staff and their positive impact on younger students are difficult to duplicate by teachers. Their continued involvement and contributions are vital to building social connections and fostering meaningful experiences for students. Although many challenges were addressed to modify interventions and promote student staff development, many challenges also remain. However, despite the challenges of that lay ahead, the anticipated benefits for students are far more significant than the hurdles that can be cleared through creative thinking and robust collaborative efforts.

ACKNOWLEDGEMENTS

The author would like to acknowledge the collaborative efforts of Michael Griffiths, Thomas Mach, Stephen McNamara, Craig Mertens, Gregory Sholdt, and Tom Stringer for their invaluable support and contributions to online activities.

REFERENCES

BASSET, R. M., (2020) Sustaining the values of tertiary education during the COVID19 crisis. *International Higher Education Special Issue 102*. Retrieved from https://www.internationalhighereducation.net/api-v1/article/!/action/getPdfOfArticle/articleID/2922/productID/29/filename/article-id-2922.pdf

BONWELL C. C., & EISEN, J. A. (1991). *Active learning: creating excitement in the classroom.* ASHE-ERIC Higher Education Report No 1. Washington, D.C.: The George Washington University, School of Education and Human Development. Retrieved from https://files.eric.ed.gov/fulltext/ED336049.pdf

DECI, E. L., & RYAN, R. M. (1985). *Intrinsic motivation and self-determination in human behavior.* New York: Plenum.

DECI, E. L., & RYAN, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11, 227-268.

GARDNER D. (2011). Fostering autonomy in language learning. In D. Gardner (Eds.), *Fostering autonomy in language learning* (pp. 5-16). Gaziantep: Zirve University. Retrieved from http://ilac2010.zirve.edu.tr

International Institute for Higher Education (2020). *COVID-19 and higher education: Today and tomorrow.* Retrieved from http://www.iesalc.unesco.org/en/wp-content/uploads/2020/05/COVID-19-EN-130520.pdf

MARINONI, G., VAN'T LAND, H. (2020). The impact of COVID-19 on Global Higher Education *International Higher Education Special Issue 102*. Retrieved from https://www.internationalhighereducation.net/api-v1/article/!/action/getPdfOfArticle/articleID/2922/productID/29/filename/article-id-2922.pdf

MARINONI, G., VAN'T LAND, H., JENSEN, T. (2020). The impact of COVID-19 on higher education around the world. *IAU Global Survey Report*. Retrieved from https://www.iau-aiu.net/IMG/pdf/iau_covid19_and_he_survey_report_final_may_2020.pdf

UNESCO (2020, April 29). 1.3 billion learners are still affected by school or university closures, as educational institutions start reopening around the world. *UNESCO.* Retrieved from https://en.unesco.org/news/13-billion-learners-are-still-affected-school-university-closures-educational-institutions

UNESCO (2019). *Education: From disruption to recovery.* Retrieved from https://en.unesco.org/covid19/educationresponse

RITCHHART, R., CHURCH, M., and MORRISON, K. (2011). *Making thinking visible: How to promote engagement, understanding, and independence for all learners.* San Francisco, CA: Jossey-Bass

YAMAMOTO, S. (2017). Implementation of the Konan language loft: A self-access center with dual functions at Konan University. *Memoirs of learning utility center for Konan university students, 2*, 51-79. doi/10.14990/00002413

YAMAMOTO. S. (2020). *The Impact of learning environments on learning outcomes: A case study of self-determination and student satisfaction in Japan* (Unpublished master's thesis). Kobe University, Kobe, Japan.

Support Design for Massive Open Online Course (MOOC) Learners -Voices from the Freshman MOOC Learners-

Yuki Ichimura
yici@kumamoto-u.ac.jp
Doctoral Student
Graduate School of Instructional Systems
Kumamoto University
Kumamoto, Japan

Hiroshi Nakano
nakano@cc.kumamoto-u.ac.jp
Professor
Graduate School of Instructional Systems
Kumamoto University
Kumamoto, Japan

Katsuaki Suzuki
ksuzuki@kumamoto-u.ac.jp
Director
Research Center for Instructional Systems
Kumamoto University
Kumamoto, Japan

The growing learner population of Massive Open Online Courses (MOOCs) indicates a large number of entry of beginners. For those novice MOOC learners, learning support is crucial. We have collected the data, informing issues and concerns that the Japanese university students experienced in their first MOOC learning. The intervention of eliminating the problems and promoting students' motivation and learning design was presented. The introductory orientation lesson was aimed to play the role of an external learning support. The effect of intervention was assessed, and the primary analysis indicated the positive effects on module completion and the students' self-study in MOOCs.

Key words: MOOCs, Learning Support, Self-Directed Learning, Orientation

INTRODUCTION

Open access nature of Massive Open Online Courses (MOOCs) allows participation of diverse learners. MOOC learners have different prerequisite knowledge and technical proficiency levels to conduct online learning using computers. In most cases, one-to-one support does not effectively fulfill the needs for massive course populations at the prompt timing, when learners face with troubles. In such online learning environments, therefore, a support system, underpinning accessible, effective, and engaging learning is crucial. Learner support is one of the key elements consisting of MOOCs in the "10 Dimensions Model" that we have proposed for MOOC design (Ichimura & Suzuki, 2017).

Looking at the current MOOCs, the existing support systems vary greatly, depending on the course providers. Furthermore, even in the same MOOC platforms, support services are unique by each course or a host institution.

In 2018, we have studied the learning experiences of MOOCs, with Japanese university students having least online learning experiences. Our research sought to key concerns of the MOOC beginners and associated with the instructional design framework, "The Five E-Model of Online Course Design" (Suzuki & Tada, 2009). The questionnaire collected the needs of MOOC beginners, particularly when and what difficulties the students experienced during their self learning. The students' voices in the questionnaire in 2018 informed us the issues obstructed at the basic stage of MOOC learning.

The students in this study learned a MOOC provided by an outside institution, and we aimed an external learning support. In 2020, for this current study, we developed an orientation lesson, with a goal of eliminating the issues that the previous study informed. The responses to the questionnaires are under analysis. We are investigating the effect of our intervention, that attempted students' motivation designing and leaning skills as self-directed learners. The aim of the study is to investigate 1) When and what support do MOOC beginners need? 2) Does an external orientation lesson play a role for learning support for MOOC learners? 3) If so, what does an external learning guidance lesson include? This paper reports the initial results.

Learner Support in Online Learning and MOOCs

Leaning support is, in any settings whether face-to face or online, fundamentally crucial for executing tasks to achieve successful learning. In an online learning environment, learner support design is important, because learners and course providers are separated in distance (Brindeley et al, 2004). In addition, in the traditional online learning, learner support was considered as a critical component for students' retention (McLaughlin,2002). McLaughlin (2002) suggested learning support in online learning with provision of social support. June and Hong (2014) qualitatively analyzed online learners' comments on the open questions in the questionnaire. The researchers suggested effective and reflective support that develop and maintain learners' motivation, reflection, and independent learning (June and Hong ,2014). Appropriate learning content promotes effective learning, with systematic support. The underlying concept of learning support seen in traditional online learning appeared to coin with MOOCs.

Research on learner support design in MOOC setting is limited in number to date. Gregori et al. (2018) pointed that MOOC leaning environment had not put major focus on learner support. According to their study, the learner retention was related to the teacher's presence and students' engagement before the second quarter of the course. However, even in the traditional online courses that are much smaller in size, direct support by the teacher is not always possible (McLaughlin, 2002). Jansen et al. (2020) argued, most MOOCs are more student-content interaction oriented, rather than teacher-student or student- student

interaction. Technology was viewed as the important role that the teachers had undertook in face to face classroom (McLaughlin , 2002).

Thereby researchers addressed the importance of Self-Regulated Learning (SRL) for MOOC learners (Jansen et al., 2020). They created an intervention video, presenting the SRL model for MOOC participants. Their lessons supporting SRL were embedded in the MOOC course, rather than being located as a pre-activity prior to the course (Jansen et al., 2020). Their intervention positively affected the retention of learners.

With scale, and diversity in MOOCs, learning support should be conducted as one of the central design focuses, especially for novice learners who are starting MOOCs.

RESEARCH DESIGN & METHODS

Japanese private university freshman students, who registered introductory computer and information literacy course in the spring semester in 2018 and 2020 participated in the study. The 92 students in 2020, and prior to them, in 2018, 44 students responded to the questionnaires regarding their first MOOC learning experiences. None of the students had experiences of learning in MOOCs.

The students registered in the recommended MOOC and replied to the questionnaires. They were encouraged to take subject related MOOCs as an out of classroom optional work; therefore, MOOC learning was not mandatory after they received the in-class introduction. The initial two modules of Japanese MOOC, “Computer no Shikumi (Mechanism of Computers)”, provided by Japan Massive Open Online Education Promotion Council (JMOOC) through Fisdom platform were recommended by the instructor and completion of the modules were assessed as an additional grade. The participants were Japanese speakers; therefore, subject -related MOOC taught in Japanese during the periods of the semester was chosen. The students answered the questionnaires and reported their learning experiences after they completed each module. The questions asked general learning experiences and students’ feedback, learning support that they needed during their process of learning and students’ perceived outcome of learning. In addition, at the end of the semester, students, including those who did not study MOOC, answered the survey. A commercial online survey system was used for collecting the feedback.

The comments on the open questions were analyzed and classified in the five groups of design categories using “The Five E-Model of Online Course Design” (Suzuki & Tada, 2009). The five categories illustrated hierarchical layers, constructing quality online learning design. The model suggests the layers, from the bottom, 1) Environmental Design 2) Content Design 3) Information Design 4) Learning Design and 5) Motivation Design. Each layer is associated with the Instructional Design (ID) techniques.

PROCEDURE

In 2018, we have studied the freshman students’ MOOC learning experiences, in order to investigate when and what support MOOC beginners needed (Ichimura, Nakano & Suzuki, 2018). A brief introduction about MOOCs and the basic technical instruction were provided in the regular lesson in 2018. Prior to the

students' MOOC learning, the instructor introduced the MOOC, "Computer no Shikumi" (Mechanism of Computers), and demonstrated the course overview and the registration process on the platform. During the introduction lesson, students tried signing up and registering. After their registration, MOOC learning was students' voluntary participation. The introductory lesson in 2018 was minimized, and the students enrolled in the MOOC as almost the same condition with the regular MOOC learning beginners.

The chosen course "Computer no Shikumi (Mechanism of Computers)" and Fisdom platform equipped general description of learning process in PDF file, FAQ, Discussion boards, and progress viewer for learner support. Help link jumps to the general explanation of PDF file that is simple structure.

The excerpt comments regarding the issues when the students needed supports were classified in the Five Layers (Table 1). Troubles and confusion of the initial process were appeared in layer 1 and 3. Issues about the contents design and mismatch of the course level were addressed in layer 2 and 4. The difficulty of content and registration process affected their motivation to maintain their learning (layer 5).

The results of 2018 revealed the basic introductory issues that the beginner MOOC learners had.

Having the students' concerns on the process of MOOC learning, especially at the entry stage (Ichimura, Nakano & Suzuki, 2018), in 2020, the current study designed an orientation lesson as an intervention for students in 2020. Self-directed Learning model (Garrison, 1997), including "self-

Quality of e-Learning Model	Students Comment
Layer 5: "Engaging": Motivation Design (Maintaining motivation, self-directed, volition, ownership)	The explanation was too difficult that I lost motivation. I gave up during the registration.
Layer 4: "Effective": Learning Design (Nature of tasks, Learning support and learner needs, interaction, self-regulation)	There was no definition and explanation for the new technical languages. Verbal explanation was difficult to understand. To understand the contents, I needed to stop the lecture videos. Need more clear states of what I can gain by the course.
Layer 3: "Easy": Information Deign (Usability, Navigation and Layout, Faster and accurate access to needed information, No disorientation problem)	Registration process needed repeated procedures. Email address and personal information was required repeatedly. The course was not appeared on the course search page. Each time, searching the course took time. Horizontal navigation scroll was not easy to notice.
Layer 2: "Exact": Content Deign (Content accuracy, Validity of learning scope, Rational and reliable)	The contents were difficult. Instructor's explanation was based on learners' prior knowledge. The level of the quizzes was too difficult. The expression of the quizzes was not clear.
Layer 1: "Ecological": Environmental Design (Access environment, Stability of service, Feeling of security)	Troubles before actual learning, such as account registration. Confusion in login requirement between user ID and email address. I could not log in at the first attempt. The internet access was not stable at home to keep learning.

Table 1. Students' Comment in the Five-E Model of Online Course Design (Suzuki & Tada, 2009)

management (task control), self-monitoring (cognitive responsibility) and motivation (entering and task) helped our design of the intervention lesson.

Orientation as an External Learning Support

The orientation lesson aimed external learning support that aid self-directed MOOC learning, eliminating students' troubles for starting, continuing, and completing modules, informed by the 2018 results. The main topics in the orientation focused basic literacy for MOOC learning, motivation design and learning design of learners' themselves.

The main issues that emerged from the 2018 students' learning experiences were in basics at the entry of MOOCs. About 48.1% of the students answered that they had troubles and stresses at the log-in and registration stage (Ichimura, Nakano & Suzuki, 2018). In addition, the observation in the first MOOC introduction lesson informed more fundamental technical issues. Some students misused character input mode, that were associated with characteristics of Japanese character input system and key boards. Japanese learners need caution in this fundamental issue.

Intervention reinforcing the introductory computer literacy skills was designed, which was necessary for MOOC learning. In the guidance, a notice was given, using examples of errors that the previous students experienced.

Five Layers Model analysis was the base for our intervention design. Corresponding to the reported issues in Layer 2 and Layer 4 that are associated with learning contents and design, the orientation included the way how to progress their knowledge, using learning resources in MOOC itself, as well as wider internet connection. Many of the students did not explore the available resources in the platforms. The previous students' survey revealed that many of them did not use caption for video lectures, or speed control function that were available on the platform. Knowing and making full use of technological functions supporting MOOC learning was integrated. Students' comments categorized in Layer 5, Motivation Design, reported that the issues related to other layers affected continuous of their learning. Therefore, motivation support was sought in the orientation design. In addition, learning skills in the isolated open online environment will support MOOC learning.

The guidance lesson covered the concept of "Learning Design" (Suzuki & Mima, 2018) tackled by freshman themselves. Resources and activities, aimed to develop students' learning skills as a self-directed learner were integrated in the guidance. The students were to think about their learning environment and learning resources, particularly in the online settings (Suzuki & Mima, 2018). In addition to the traditional face-to-face learning communities where the students had been in, the students learned the benefit of open and sharing nature of the web. MOOCs and other online learning resources, such as Open Educational Resources, webiners, and Youtube were introduced as a reference tool for their online learning. In addition, self-direction was encouraged during the instruction of MOOC learning steps. The features and the functions of MOOC platforms were introduced with comparison between the traditional classroom settings. The MOOC guidance lesson covered how to prepare, register, learn in MOOCs, as well as the students

learned how to learn for the lifetime. The guidance was provided online, with self-learning part and a live lesson, using ZOOM.

RESULTS

This paper includes a preliminary report of the results gained in the Spring semester in 2020. After the orientation in 2020, the students' module completion rate improved. 68.5% of the students completed at least one module. Compared to 45.4% in 2018, about 23% more students completed the modules.

The feedback comments regarding the orientation were positive. Amongst the all free comments, 69.4% mentioned positive impacts of MOOCs. 19.4% expressed the willingness to learn. About 2.8 % expressed anxiety for learning. Overall, the students' reaction toward MOOCs that enables free access to the university courses worldwide illustrated their excitement for knowing new online learning resources. The excerpts of the comments were as follows:

"Getting access to courses by famous universities is an innovative system, and I would like to widen my view". "I thought we have benefits of more learning opportunities, and I would like to register something that I find interesting". "I felt that knowing about MOOCs broadened my horizon."

The questionnaire asked if the students had any troubles before and during the process of learning, after they finished each module. In the result in 2018, 27.6% reported that they experienced troubles to start the course, and 40.2% reported that they had troubles before completed the modules. In 2020, after the guidance lessons were presented, the students' perceived experience was improved. 100 % replied that they could completed the module without troubles. 1 % in 2020 reported that they had troubles to start the course. The orientation helped eliminate the pain and issues. A statistical analysis of Chi-square test indicated significant difference between 2018 and 2020.

DISCUSSION

After the guidance lesson in 2020, that aimed motivation design and development of learning skills, students' module completion rate grew. The 2020 Spring semester was the time to coincide with the impact of COVID 2019. Possible third factor of high module completion in the 2020 spring semester is that their regular lessons converted online, and they stayed at home. Another consideration is that regular online lessons helped improve students' basic computer literacy skills for learning in MOOCs.

We are conducting a qualitative analysis on the students' comment that will inform more in depth.

This study assessed only one MOOC that is delivered in Japan, and the condition of MOOCs presented by other world-wide MOOC providers would be the area for further investigation.

CONCLUSION

In the reviewed paper, the past researchers recommended learning support for online learning in the relatively higher order domains, as exemplified as the notion of social support (McLaughlin, 2002). The Japanese students' voices, however, called for learning support from more fundamental levels in the very

beginning stage of learning. In the current study we designed the initial orientation lesson for MOOC learning as an external support that enables learning by students themselves. We investigated if it eliminates the students concerns, and if it supports students' module completion, even though the MOOC course design was under the same condition. We designed the lesson, including fundamental technical literacy, motivation design, and learning design of students themselves for their self-directed learning, using the Five Layers Model (Suzuki & Tada, 2009). The results indicated that the orientation lesson gave a positive impression about learning in MOOCs, and the motivation to learn. Module completion rate and the reduced number of perceived issues during their learning appear to that the orientation lesson functioned as an external support for starting, continuing, and completing MOOC learning. Technical skills training is not sufficient to sustain the MOOC beginners learning, especially if we intend to support them from outside of the institution who provides MOOCs. Motivation design and self-directed learning design would be important factors that inspire the learners who have had traditional education in the K-12 school systems. In MOOC learning, without skills of self-directed learning, students experience anxiety, frustration, and failure as Knowles stated (1975).

REFERENCES

Brindley, J. E., Walti, C., & ZawackiRichter, O. (2004). The current context of learner suppo rt in open, distance and online learning: An introduction. *Learner support in open, distan ce and online learning environments*, 9-28.

Garrison, D. R. (1997). Self-directed learning: Toward a comprehensive model. *Adult education quarterly*, *48*(1), 18-33.

Gregori, E. B., Zhang, J., Galván-Fernández, C., & de Asís Fernández-Navarro, F. (2018). Le arner support in MOOCs: Identifying variables linked to completion. *Computers & Educat ion*, *122*, 153-168.

Jansen, R. S., van Leeuwen, A., Janssen, J., Conijn, R., & Kester, L. (2020). Supporting lear ners' self-regulated learning in Massive Open Online Courses. *Computers & Education*, *14 6*, 103771.

Jung, I., & Hong, S. (2014). An elaborated model of student support to allow for gender con siderations in Asian distance education. *The International Review of Research in Open an d Distributed Learning*, *15*(2).

Ichimura, Y. & Suzuki, K. (2017). Dimensions of MOOCs for Quality Design: Analysis and Synthesis of the Literature. *International Journal for Educational Media and Technolog*y, 11(1). 42-49.

Ichimura, Y., Nakano, H., & Suzuki, K. (2018). Design Implications to Support MOOCs Lear ners. In *Proceedings of the 43rd Annual Conference of JSiSE.*

Knowles, M. S. (1975). *Self-directed learning: A guide for learners and teachers.* New York : Association Press.

McLoughlin, C. (2002). Learner support in distance and networked learning environments: Ten dimensions for successful design. *Distance Education*, *23*(2), 149-162.

Suzuki, K. & Mima, N. (Eds). (2018). Gakusyu Sekkei Manual " [Learning Design Manual]. Kyoto : Kita-Oji-Shobo.

Suzuki, K., & Tada, N. (2009). A layers-of-quality model in online course design: The five-e model. *International Journal for Educational Media and Technology*, *3*(1), 92-103.

The Changing Concepts of Media, and Prospects for Education

Hoseung Byun
hobyun@chungbuk.ac.kr
Professor
Chungbuk National University
Cheongju, Korea

Seunghyeon Choi
paideia@chungbuk.ac.kr
Professor
Chungbuk National University
Cheongju, Korea

The meaning of medium is accepted as "something that is in a middle position" or something that "mediate" "in between" or/and "deliver". However, the concepts and functions of a media are diverse and philosophical, sometimes viewed as positive and sometimes negative. This study traces the concepts and understandings of media in the eyes of philosophers since that of Plato's. In Phaedrus, Plato was skeptical about the nature of written media and at the same time showed concerns about spoken words. Along the history, Vilém Flusser, Walter Benjamin, Jacques Derrida, Friedrich Kittler, and Marshall McLuhan, all had their understanding of media which give us insights on how we could understanding them in educational contexts. This study is to explain and compare the concepts of media understood by philosophers and to provide future-oriented implications for the fourth industrial revolution era.

Key words: media philosophy, mediality, concept, medium

INTRODUCTION

The meaning of ‘medium’ is understood as “something in a middle position” or “a means of effecting or conveying something (Meriam Webster, 2020).” Media, the plural form, is “the means of communication, as radio and television, newspapers, magazines, and the Internet, that reach or influence people widely.” ‘Medium’, ‘media’,‘mediation’, ‘medial’, and ‘mediality’, are grouped together as similar fundamental concepts and had been the center of interest to philosophers. However, throughout history the meaning and understanding of media had changed. Studies on the characteristics of media was rigorously pursued in Europe, and it is time to consider them in terms of educational context. This study is to examine the definition and/or understanding of media and takeaway suggestions for future education.

Early Concepts of Media

The term ‘medium’ originated from Latin word ‘medius’ whch means ‘middle’. It is not means or tools, but something ‘in the middle’ that mediates or delivers. Aristotle, in his Poetics, explains that poetry is a mode of imitation, and is ‘different’ in three aspects: the medium, the objects, and the mode or manner of the imitation (Guillory, 2010). Aristotle does not elaborate further on the topic, and the concept of medium was left untouched for several thousand years. Natural science and classical physics understood medium as a matter or substance something like ether (Mersch, 2006). Later it added the

meaning of functional character due to the development of technology, eventually immaterialing the concept.

While we live everyday with media and do conduct studies on media, the first reflection on media was revealed in Plato's Phaedrus. It is a dialogue about Socrates and Phaedrus. In the dialogue Socrates talks about a legend of Egyptian god Theuth and King Thamus. When Theuth remarks on his invention of letters that will support memory of Egyptians, Thamus critically responds that it is a remedy for reminding, not remembering, and it will make the learners not use their memories and create forgetfulness. A written text, alienated from its author, cannot be flexible and are prone to misinterpretation and abuse. It is understandable that in ancient Greece, writing was a new emerging technology (Roochnik, 2015).

Text mediation and intellectual development

The world of text breaks the relationship with the authority of the traditional mind by concretely realizing the reason. Liberation from transmitted authority leads to the question, 'How much is human ability affected by nature or custom?' This question gave rise to human texts that contrasts with the divine texts, a philosophy of language that recognizes objects individually in place of the book of nature. How did humans start reasoning? What distinguishes humans from animals? Humans, unlike animals, have a language since birth. From the perspective of Johann Gottfried von Herder (1744~1803), humans have language since birth. This is because there is an intellect only in humans that consciously uses sound. Human beings perceive what is perceived as a symbol and associate it with themselves to continuously write in a book. Language is the medium of all thoughts. It is not ideas or imaginations that produce words, but words produce thoughts (Herder, 2003).

Book as a medium of modern intelligence

Descartes' (1596-1650) philosophy is the result of pursuing new certainty in the socio-economic crisis of modern Europe. The uncertain mediation between me and the world replaces the revelation of existing gods through mathematical proofs. The distinction between matter and mind drives the emergence of powerful theories in mental science, granting privileges to metaphysics. In the case of natural science, it is expressed by introducing new research methods. Thanks to it, the body is no longer sacred, and medical interference does not spoil the soul. The emergence of printing helped develop consciousness of self 'as subject', which helped question the reality of the world. The philosopher finds himself as an author, not as a Bible commentator, by reflecting on thought and writing. This era of rationalism, which demands universality and eternity, gave rise to a special 'mediality.' Mediality is a sign of civilization that opposes all forms of directness (Descartes, 1610; Hartmann, 2008).

Images versus texts

The first systematic discussion of the relationship between images and texts appears in Gotthold Ephraim Lessing (1729–1781)'s 'Laokoon: On the Limits of Painting and Poetry.' Lessing explains that image is the structure of space and present, and the language is the structure of time and continuity. The mediality of the image is static and topographical, and that of text is time and linear (Yoon, 2002). The pictorial does not have the ability to describe the chronical arrangements, but only spatial. What is procedural is new to painting, and everything is visible at once. The artist uses only one moment in the ever-changing nature, especially the painter can use that moment from only one perspective. On the other hand, literary art passes through development, and it is shaped through language means. Arts could treat only of beauty, however, poetry, not being limited to the passing moment, could deal with the whole of nature (Keller, 1917).

Walter Benjamin - technical cloning and media literacy

According to Walter Benjamin (1892~1940), photography is an event that unfolds a space we were not aware of, and at the same time signals the advent of cloning technology. In the sense that photographs can be mass produced, the author's personal intention is now replaced by the code of collective acceptance. Tools, such as cameras, can be handled by the public, and require changes in professional education to train specific technicians. The fact that they have begun to transform into social constructs, the author and his work preoccupied the concept of media literacy of today. Compared to painting, the movie shows two big differences. First of all, the scenes in the movie provide a tactile spectacle that does not allow calm contemplation. Second, a large number of people can enjoy the movie without going to the gallery. Tactility and popularity opened the possibility to reverse the logic of humanity improvement based on contemplation and elitism (Benjamin, 1930; Yasuo, 2012).

Media as environment and cultural producer

Those including Marshall McLuhan, Harold A. Innis, Eric A. Havelock, Jack Goody, and Walter J. Ong are called Canadian School (Yoo, 2013). According to the economic historian Innis (1894~1952), the materiality of communication media, from clay, papyrus, parchment, cloth, and paper contributed to the continuity of a culture in the two dimensions; time and space. Different media influenced the character of knowledge throughout the history and monopolies of knowledge that form around these media were pushed aside by the new media that emerged (Friesen & Cressman, 2012). McLuhan (1911~1980) took over Innis' critical mind and formulated two things. First, the end of the Gutenberg Galaxy marks the propagation of the radio and the transition to the electrical era using the human central nervous system at a global level. In this era, human beings can recognize and reflect in real-time cultural innovations as technology advances through instant information movement. Second, the

thesis that “The medium is the message” indicates that the media, beyond the delivery of neutral content, are devices for social communication and cultural production. “The interiorization of the technology of the phonetic alphabet translates man from the magical world of the ear to the neutral visual world (McLuhan, 1962, p.18).” McLuhan argues in Gutenberg Galaxy that the advent of the printed books brought forth the change of human perception. Technologies are not only inventions, but also are the means by which people are re-invented. Invention of print technology was the decisive moment in the change from an all-sense culture to a visual-dominated one. The Canadian, or “Toronto School,” also supported the view of ″mediatic a priori,” which refers to “the various ways in which media ‘always already’ make possible and condition the production and circulation of information, knowledge, and experiences in everyday life (Friesen, 2010). ”

Homo Ludens and Telematic Society

Vilém Flusser (1920~1991) thinks of the meaning of human playing with a camera, Homo Ludens. Unlike previous artists who devote themselves to drawing pictures as if they were working, taking pictures requires technical imagination to understand the device and to produce images. However, a person who takes the picture plays with the camera while exploring new tricks, such as the person who plays chess. Since the alphabet era, when the human eyes and technical devices such as cameras are combined, a ‘telematic society’ has emerged in which various subjects are connected through a computer communication network. In this society, the technical image contains the main thought form and content, and the sensing and reasoning organs have also changed from ears to eyes (Flusser, 2001; Pias, 2004).

Flusser analyzed communication and discourse, symbols and codes with a communication theory called ‘Communicology’, and discussed popular technological forms and popular imaginations (Saskia, 2010). According to him, humans used three codes: ‘images’ of prehistoric age, ‘texts’ of historical age, and “technical images” of post-historical age from the perspective of human cultural history. Advances in technology have brought back images of the past: ‘images→texts→images (technical images)’ (Flusser, 1983). His prophecy that the emergence of cameras will lead to a crisis of texts and that images will become the dominant code in the future society is realized today. It is a remarkable insight that he predicted the ‘Telematic Society’, a network society dominated by ‘Net Dialogues’ even though the Internet did not exist at the time of his survival.

Kittler’s Humans combined with medium

Friedrich A. Kittler (1943-2011) describes the relationship between humans and technology media as extreme technology determinism. Through the materialistic point of view that the media defines human perception *a priori* rather than merely a means of communication, he challenges the humanistic view that has dominated German philosophy (Do, 2008). The roles of media are storage and communication of

information. Kittler examines analogic media like gramophone, film, and typewriter, which records sound, image, and text, respectively. Through historical analyses of media, Kittler saw that around 1800 the closed scholar system based on authority and erudition shifted to a more open system due to alphabetization. In 1900s, book as a primary storage medium was challenged by new technologies such as gramophone, film, and typewriter (Gane, 2005). He described civilizations based on the materiality of communication by assuming that modern humanities symbolizing 'spirit' was already a product of the development of typography symbolizing text as 'technology. ' Humans are connected beings by learning new rules and principles of digital electronics such as mobile phones and computers. The user's experience may be abruptly invalidated by new technologies, and it is always necessary to adapt to the complex virtual reality of digital electronics (Yoo, 2019).

Media and Education Ahead

The transition from print media to the information society asks about the relationship between technological change and social phenomena. The advent of the information society changed the meaning of communication from interaction to social information processing (Yasuo, 2012). Sandbothe (2000), regarding media transformation attempted to visualize the change in the Internet era. He expected four basic assumptions in traditional education to be changed. First, out of context knowledge is delivered in classroom. Second, lessons take place as communication among students present in class. Third, teachers have the authority of omnicompetent knowledge administrators. Fourth, there exists established knowledge structure in a hierarchical order. The Fourth Industrial Revolution is led my even new technological media, and is expected to change our lives as well as education system. Theory of mediatic a priori stands strong.

REFERENCES

Benjamin, W. (1930). Das Kunstwerk im Zeitalter seiner technischen Reproduziebarkeit/Kleine Geschichte der Photographie. Translated by Choi, S. M. (2007). Paju: Gil.

Bennett, T. (1982). *Theories of media, theories of society*. In T. Bennett, J. Curran, M. Gurevitch, & J. Wollacott (Eds.). Society and the Media (pp. 30-55). London: Methuen.

David Laltheide & P. Snow Robert (1988) Toward a Theory of Mediation. *Annals of the International Communication Association, 11*(1), 194-223. DOI: 10.1080/23808985.1988.11678687.

Derrida, J. (1972). *La Dissémination*. Paris: Seuil.

Descartes, R. (1610). Discours de la Methode. Translated by Lee, H. B. (2019). Korea: Paju, Munye Publication.

Do, K. S. (2008). Medientechnik und neue Anthropologie - Am Beispiel von Kittlers Medientheorie, 108: 191-208. In Korean.

Flusser, V. (1983). *Towards a philosophy of photography*. London: Reaktion Books.

Friesen, N. & Cressman, D. (2012). *The Canadian School of Media Theory*.

Friesen, N. (2010). Marshaling McLuhan for Media Theory. *English Studies in Canada, 36*(2), 5-9.

Griffin, M. (1996). *Literary Studies +/- Literature: Friedrich A. Kittler's media histories*. *New Literary History, 27*(4): 709-716.

Guillory (2010).

Guillory, J. (2010). Genesis of the Media Concept. *Critical Inquiry, 36*(2): 321-362.

Hartmann, F. (2008). *Medienphilosophie*. Translated by Kang, E. K. & Lee, S. Y. Seoul: Book Korea.

Herder (1772). Abhandlung über den Ursprung der Sprache. Translated by Cho, K. S. (2003). Paju: Hangilsa.

Keller, H. R. (1917). *Laokoon*. The Reader's Digest of Books. The Library of the World's Best Literature. https://www.bartleby.com/library/readersdigest/1165.html.

Kittler, F. (1986). *Grammophon, Film, Typewriter*. Berlin: Brinkman & Bose, 340 p. Translated by Yoo, H. J. & Kim, N. S. (1999). Seoul, Korea: Literature and Intellect.

Lister, M., Dovey, J., Giddings, S., Grant, I., and Kelly, K. (2009). *New Media: A Critical Introduction* (PDF) (2nd ed.). New York, N.Y.: Routledge.

McLuhan, M. (1962). The Gutenberg Galaxy: The making of typographic man. Toronto, Canada: University of Toronto Press.

Mersch, D. (2006). *Medientheorien zur Einführung*. *Junius Verlag*. Translated by Culture Studies (2009). Seoul: Yonsei University Press.

Pias, C. et al.(2004). *Kursbuch Medienkultur : die maßgeblichen Theorien von Brecht bis Baudrillard*. Tranlated by An, S. C. (2018). Seoul: Seoul National University Press.

Plato (B.C., 360). Phaedrus. http://classics.mit.edu/Plato/phaedrus.html.

Roochnik, D. (2015). *Plato and Aristotle on the Emerging Medium*. In J. Floyd and J. E. Katz (Eds.) Philosophy of Emerging Media: Understanding, Appreciation, Application. Oxford Scholarship Online.

Sandbothe, M. (2000). Media philosophy and media education in the age of the Internet. *Journal of Philosophy of Education, 34*(1): 53~69.

Sell, Saskia. (2010). *Structure and Dynamics of the Telematic Society: Reinventing Vilém Flusser's Communicology*. In Regeneration and Reinvention: Practices of the 'new'. The European Studies Research Institute, University of Salford.

Shim, H. R. (2012). *Twentieth Century Media Philosophy*. Greenby.

Yasuo, I. (2012). What is delivery in education. *Study in Educational Philosophy, 34*(4). 152-178. Translated by Han, H. J.

Yoo, H. (2013). Die Schriftlichkeit in der modernen Medientheorie - Von der kanadischen Schule bis zur Kittlerschen Theorie. *Geisteswissenschaften, 97*: 319-342.

Yoon, D. J. (2002). Lessing's Der junge Gelehrte. *Goethe Studies, 14*: 109-131.

Yoo, H. (2019). Über die Anerkennung der Kunstgrenzen - Lessings Laokoon und die Intermedialität. *Bertolt Brecht und das Moderne Theater, 40*: 281-298.

Changes of Students' Beliefs about Cooperation in Synchronous Online Mathematics Classes Incorporating Cooperative Learning

Tomohiko Shima
t.shima712824@gmail.com
Math teacher
Kanagawa Gakuen Girls' Junior & Senior High School
Kanagawa, Japan

Yuki Watanabe
wat@rs.tus.ac.jp
Associate professor
Tokyo University of Science
Tokyo, Japan

Minoru Ito
itohm@rs.tus.ac.jp
professor
Tokyo University of Science
Tokyo, Japan

This study aims, in synchronous online math classes for a large number of 191 first-year junior high school students, to deliver first “Zoom-based whole-class lecture-style lessons (hereinafter, this is called "Zoom-based Lecture")” and then “Zoom-based whole-class lecture-style lessons that incorporate cooperative learning (hereinafter, this is called "Zoom-based Lecture + CL"),” to investigate changes of students’ belief about cooperation. As a result of the zoom-based Lecture + CL, the belief about cooperation was improved in terms of the reduction in the score of the individual orientation factor and inequity factor. Even in zoom-based Lecture, the belief about cooperation was improved in terms of the reduction in the score of the individual orientation factor. From the viewpoint of students' belief about cooperation, in the online classes, even if it was a lecture-style lessons, it was suggested that it is important to provide not only the asynchronous delivery type classes but also the synchronous online classes using Zoom etc.

Key words*: Synchronous Online Classes, Mathematics Education, Cooperative Learning, Round Robin, Zoom*

INTRODUCTION

As a result of the new coronavirus pandemic, online classes are more prevalent than before. Many students were already being offered “blended learning” in which, as well as acquiring knowledge and skills in online classes, they also received more detailed supervision and face-to-face teaching by a teacher, and enjoyed contact with friends in classes in traditional classrooms (Horn & Staker, 2014). However, under the current global circumstances, face-to-face lessons with students in the classroom are difficult, and the situation has even arisen in which all teaching that was traditionally carried out in a classroom is now handled online. Studies have indicated the importance in education of interaction between teacher and learner and between fellow learners (Miyaji, 2009), and that students who favor the social aspects of learning are strongly motivated by cooperation (Reigeluth & Karnopp, 2013). However, even when a learning environment conducive to cooperative learning is provided, there are notable variations in the outcome of cooperative learning, depending on the participating students’ belief about cooperation

(Nagahama et al., 2009). Nagahama and Yasunaga (2010) have already clarified that, in onsite lessons, students' belief about cooperation is changed positively by interactive classes incorporating cooperative learning, and their belief about cooperation is changed negatively by lecture-style classes. In addition, Shima, Watanabe and Ito (2016) were able to improve students' belief about cooperation in onsite math classes in junior high school, by incorporating basic cooperative learning structures. On the other hand, online classes require instructional design measures to strengthen social relationships in order to reduce the chances of face-to-face contact between teachers and learners, and between learners (Gagne et al., 2004). It has been pointed out that students who are bored or unable to continue to concentrate if the class is a lecture-only（Johnson et al., 1991). This implies that i) incorporation of interactive learning into synchronous online lessons and ii) lesson delivery that improves students' belief about cooperation will both make a valuable contribution to current educational practice. This study aims, in synchronous online math lessons for a large number of 191 first-year junior high school students who have never met face-to-face, to deliver first "Zoom-based whole-class lecture-style lessons (hereinafter, this is called "Zoom-based Lecture")" and then "Zoom-based whole-class lecture-style lessons that incorporate cooperative learning (hereinafter, this is called "Zoom-based Lecture + CL")," to investigate changes of students' belief about cooperation. The hypothesis is that straightforward Zoom-based Lecture do not improve the belief about cooperation but Zoom-based Lecture + CL do improve the belief about cooperation.

CLASS DESIGN

Learning Environment

The subjects of this study were 191 first-year students at a private junior high school for girls. In ordinary years, the girls attend an admission ceremony in April. However, this year, they have not had the opportunity to meet face-to-face, because of the temporary closure of the school in line with the state of emergency declared by the Japanese government. In addition, because this is a private school, many students commute to school by train, coming from far and wide, and it is rare for them to be already acquainted. Table 1 summarizes recent relevant trends for Japan as a whole and for the school participating in the study.

Table1

Trends for Japan as a Whole and for First-year Students in the Junior High School in Question, from April to July

Month	Japan as a whole	First-year students at the junior high school
April	State of emergency declared	School closed (second year and above, online learning; first year, tasks sent electronically)
May	State of emergency remains in place	School closed (online learning for the whole school) ● 5/12～5/19 Teaching via electronic distribution of

		PowerPoint files ● 5/20～5/25 Zoom-based Lecture ● 5/26～5/29 Zoom-based Lecture + CL } Our study
June	State of emergency remains in place Gradual lifting	Staggered school attendance (all school years have a combination of online learning and staggered school attendance)
July	Lifting	Everyone at school

In addition, although students possess standard textbooks and workbooks, this academic year, specific ad hoc workbooks have been prepared for them to fill in during the online lessons. These workbooks contain questions and cooperative scenarios based on the content of the textbooks, thereby minimizing the notes that students need to take during the online lesson from the PowerPoint file or Zoom commentary, and allowing them to focus their learning on understanding the commentary and doing practice questions. These specially prepared workbooks are mailed to the students' homes ahead of time. There is an online commentary by the teacher, and the lesson follows the exact pattern laid out in the workbooks that the students have to hand (figure 1).

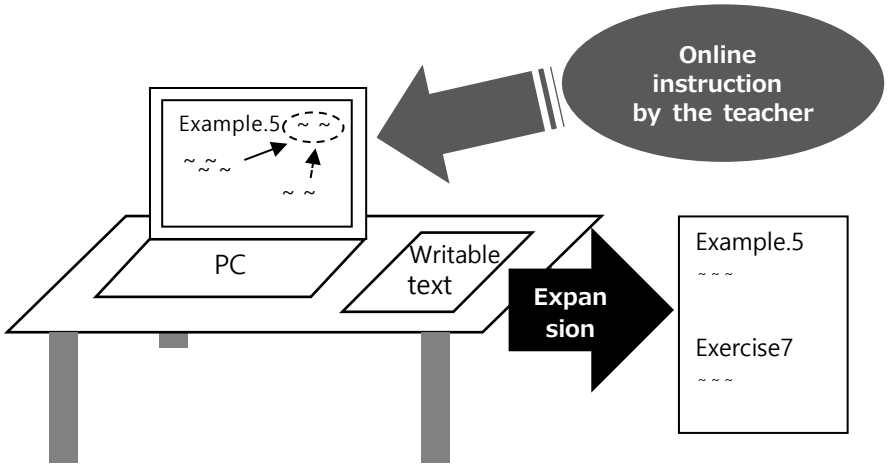


Figure1. Students' learning environment at home

Class Design

Online classes, it is difficult for teachers to deal with students immediately, and it is not effective from the perspective of class control to fully incorporate cooperative learning until they get used to it (Wilson, 2013). Furthermore, given that instructions for cooperative situations are more complicated than onsite, it seems effective that the cooperative learning structure is simple and can be used repeatedly. From the above, the cooperative learning conducted in this research mainly focuses whole-class lecture-style lessons that incorporated cooperative learning. Round Robin (Kagan, 1994) was adopted as the cooperative learning

structure for simplicity and individual responsibility. Cooperative learning (Round Robin) was conducted in the last 15 to 20 minutes of the 50-minute class.

Round Robin processes (20 minute model)

Step1. The teacher asks a question. Each student spends time thinking alone. (about 5 minutes)

Step2. Students are divided into groups of three or four. Students in turn say their thoughts and discuss the problem in groups. (about 10 minutes)

Step3. A student chosen randomly by the teacher reports back to the whole class on her group's discussion. (about 5 minutes)

METHODOLOGY

Research Procedures and Materials Used

In synchronous online mathematics lessons for first-year junior high school students, "Zoom-based whole-class lecture-style lessons (Zoom-based Lecture)" were delivered, followed by "Zoom-based whole-class lecture-style lessons that incorporate cooperative learning (Zoom-based Lecture + CL)"; changes in the belief about cooperation were investigated. Figure 1 shows the flow of the study. In the cooperative learning scene, use the Breakout Room function of Zoom to divide into groups of 4 people and practice. The degree of progress with learning and retention of curriculum knowledge is cause for concern under current social circumstances. It will be effective when selecting cooperative scenario teaching materials to base the cooperative learning on themes directly related to the curriculum, rather than on special teaching materials that are not included in the existing textbooks, etc., thereby facilitating deeper understanding of the curriculum and leading to knowledge retention. Selection of new teaching materials under current circumstances is also high risk from the viewpoint of effective use of time, thus materials suitable for use in online cooperative learning were selected from among existing teaching materials. Table 2 shows the teaching materials used in the three cooperative scenarios in this study.

Survey Item

In this study, we use the belief about cooperation scale developed by Nagahama et al. (2009). The belief about cooperation scale consists of three factors, 18 items: usefulness of cooperation factor (9 items), individual orientation factor (6 items), and inequity factor (3 items). Students evaluate how much they agree with each item using a five-point method (1: No at all-5: Very at all). The usefulness of cooperation factor evaluates a student's opinion on the value of the statement: "I can get a better result when I get along with friends." The individual orientation factor demonstrates the strength of the value of individual orientation, such as "I cannot do what I want to when I work with friends." The inequity factor illustrates the severity of inequity, which means to say that cooperative activities do not always yield the same advantages for all students. For example, students believe, "It's not necessary for people who can work

by themselves to work in a group." When students' belief in cooperation is positive, it is expected that the usefulness of cooperation factor receives higher marks while individual orientation factor and inequity factor earn lower points.

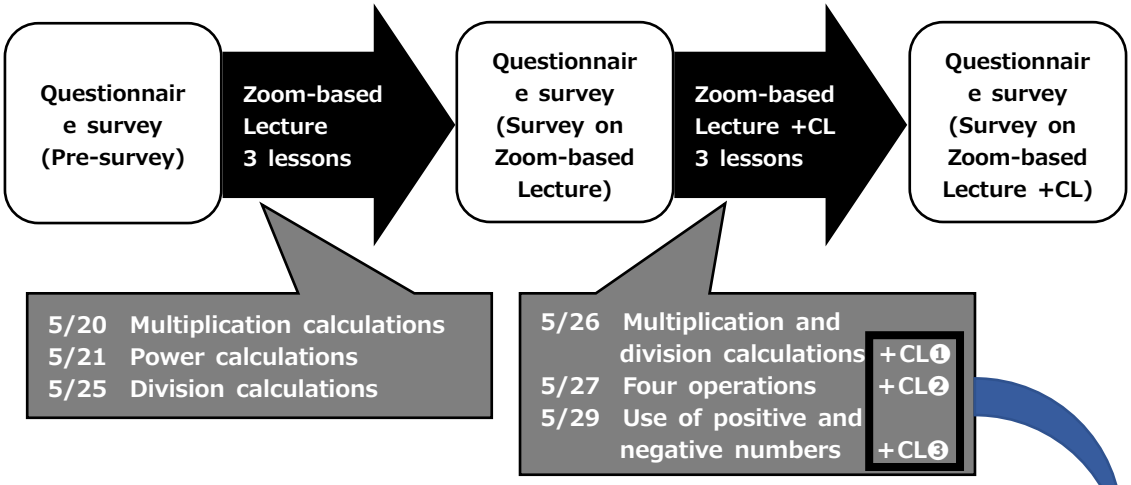


Figure1. Research procedures

Table2

Materials Used

CL① (Tanaka, 2017)

Are the following calculations correct? Please identify any mistakes and give the correct answer.

(1) 7×(−9)÷(−3)

花子： 7×(−9)÷(−3)
= (−63)÷(−3)
=21

太郎： 7×(−9)÷(−3)
=7×(+3)
=21

(2) (−8)÷2×5

花子： (−8)÷2×5
= (−4)×5
=−20

太郎： (−8)÷2×5
= (−8)÷10
=−0.8

CL② (Tamaoki, 2014)

Are the following calculations correct? Please mark any mistakes you identify and give the correct answer. Also, where there are mistakes, please discuss strategies for reducing them.

(1) 8−5×(−6)
=3×(−6)
=−18

(2) (−27)÷(−3) 2
= (−27)÷(−3)×(−3)
= 9×(−3)
= −27

CL③

As in the example below, using the digit 4 four times and the symbols +, -, x, ÷, and (), find calculations that result in -6, -5, -4, -3, and -2. Use of 44 is allowed. If you finish, please challenge yourselves further by finding calculations that result in -7.-8. -9, and -10.

EX： (−4−4)÷(4+4) =−1

Analysis Guidelines

Regarding three groups of belief about cooperation criteria elements [usefulness of cooperation elements, individual-oriented elements, and inequity elements], the average number of points for items included in each group of elements are taken as a subscale score; the normality, or otherwise, of each score is confirmed, and analysis is carried out using a suitable single-factor paired test method.

RESULTS

The answers from 158 students excluding 33 students whose answers do not satisfy the requirements for this survey were analyzed. In synchronous online math lessons for first-year junior high school students, "Zoom-based Lecture" were delivered, followed by "Zoom-based Lecture + CL"; changes in the belief about cooperation were investigated. In order to confirm the normality of the dependent variable, the Shapiro-Wilk test was performed for each subscale, and the assumption of normality was established as the overall tendency. Therefore, repeated factor analysis of variance of one factor was performed. The differing scales of students' belief in cooperative learning was examined with one-way analysis of variance, after practicing basic structures of cooperative learning that were planned for this survey (Table 3). As a result, no significant main effect was found for the usefulness of cooperation factor (Figure 2). Regarding the individual orientation factor, a significant main effect was seen at $F=22.70$, $df=2$, $p<.001$. Therefore, as a result of multiple comparisons using Bonferroni's correction, the scores from Pre to Lecture ($p<.05$), from Lecture to Lecture + CL ($p<.001$), and from Pre to Lecture + CL ($p<.001$) were all significantly lower (Figure 3). Regarding the inequity factor, a significant main effect was found at $F=2.71$, $df=2$, $p<.05$. Therefore, as a result of multiple comparison using Bonferroni's correction, the score from Lecture to Lecture + CL ($p<.05$) was significantly lower (Figure 4).

Table 3
Transition of Subscale Score of the Belief in Cooperation Scale and Result of One-factor Repeated Measures Analysis of Variance (n=158)

Factor	Pre M (SD)	Lecture M (SD)	Lec+CL M (SD)	F value	Test	Multiple comparison
usefulness of cooperation	4.35 (0.46)	4.33 (0.50)	4.31 (0.55)	1.34	n.s.	
individual orientation	2.83 (0.55)	2.74 (0.60)	2.58 (0.69)	22.70	***	Pre>Lecture * Lecture>Lec+CL *** Pre>Lec+CL ***
inequity	2.08 (0.70)	2.09 (0.72)	2.00 (0.69)	2.71	*	Lecture>Lec+CL *

*p < .05, ***p < .001

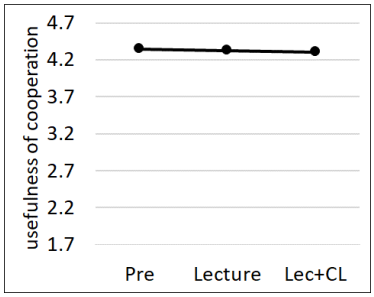


Figure 2
usefulness of cooperation factor

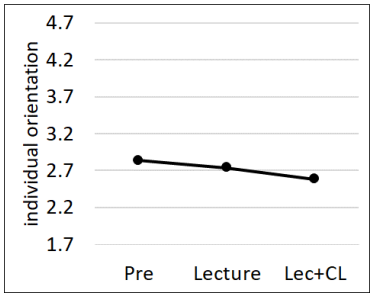


Figure 3
individual orientation factor

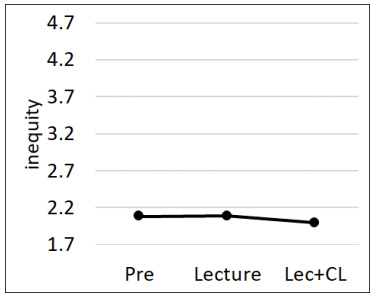


Figure 4
inequity factor

DISCUSSION

This study aimed, in synchronous online math lessons for a large number of about 200 first-year junior high school students, to deliver first "Zoom-based Lecture" and then "Zoom-based Lecture + CL," to investigate changes in the belief about cooperation. As a result, no significant difference was seen with regard to the score for the usefulness of cooperation on a group of elements, but a significant difference was seen with regard to the score for the individual orientation and for the inequity. The reduction in the scores for the individual orientation factor and for the inequity factor as a result of the "Zoom-based whole-class lecture-style lessons that incorporated cooperative learning" (Lecture→Lecture +CL) was in line with the study's hypothesis. It is suggested that the use of Round Robin conducted in the online class was effective.

Meanwhile, the score for the individual orientation factor also fell in straightforward "Zoom-based Lecture," a result (Pre→Lecture) that differed from the hypothesis. However, upon reconsideration, it is likely that the first-year junior high school students in the study, having sheltered in place in isolation since starting junior high school, were anxious to experience learning with someone else. The possibility is suggested that, even in straightforward Zoom-based Lecture, the very fact of receiving a lesson with friends led to a reduction in the individual orientation group of elements. From the viewpoint of students' belief about cooperation, in the online class, even if it was a simultaneous lecture type class, it was suggested that it is important to provide not only the asynchronous delivery type class but also the synchronous online class using Zoom etc. On the other hand, this study is limited in that it is the introduction period of the synchronous online lesson, and that it targets students who have never met directly. From the perspective of reliability, continuous research and comparative studies are needed.

CONCLUSION

This study aimed, in synchronous online math lessons for a large number of about 200 first-year junior high school students, to deliver first "Zoom-based whole-class lecture-style lessons" and then "Zoom-based

whole-class lecture-style lessons that incorporate cooperative learning," to investigate changes in the belief about cooperation.

- The reduction in the scores for the individual orientation factor and for the inequity factor as a result of the "Zoom-based whole-class lecture-style lessons that incorporated cooperative learning" (Lecture→ Lecture + CL) was implying that the lesson design used in this study is effective. It is suggested that the use of Round Robin conducted in the online class was effective.
- Even in Zoom-based Lecture, the belief about cooperation was improved in terms of the reduction in the score of the individual orientation factor. From the viewpoint of students' belief about cooperation, in the online class, even if it was a lecture-style lessons, it was suggested that it is important to provide not only the asynchronous delivery type class but also the synchronous online class using Zoom etc.

REFERENCES

Gagne, R. M., Wager, W. W., Golas, K. C., Keller, J. M. (2004). *Principles Of Instructional Design*. Wadsworth Pub Co.

Johnson, D. W., Johnson, R. T., Smith, K. A. (1991). *Active Learning: Cooperation in the College Classroom*. Interaction Book Co.

Horn, M.B., Staker, H. (2014). *Blended: Using Disruptive Innovation to Improve Schools*. Jossey-Bass.

Kagan, S., Kagan, M. (2009). Kagan Cooperative Learning, San Clemente, CA:Kagan Publishing.

Miyaji, I. (2009). *Toward Blended Learning from E-learning*. KYORITSU SHUPPAN CO.

Nagahama, F., Yasunaga, F., Sekita, K., Kouhara, S. (2009). Development of a Scale to Measure Belief in Cooperation. *The Japanese Journal of Educational Psychology*, 57, 24-37.

Nagahama, F., Yasunaga S. (2010). Changes of the belief in cooperation: comparison of cooperative class with lecture class at university. *The Nanzan Journal of Human Relations*, 9, 35-42.

Reigeluth, C. M. , Karnopp, J. R. (2013). *Reinventing Schools: It's Time to Break the Mold*. Rowman & Littlefield Education.

Shima, T., Watanabe, Y., Ito, M. (2016). The Changes of Students' Belief in Cooperation Using the Basic Structure of Cooperative Learning in a Mathematics Class. *Japan journal of educational technology*, 39, 293-304.

Tamaoki, T.(2014). *Junior high school math class 100 teaching materials(1 grade)*, Meijitosho Shuppan Co, 35.

Tanaka, M.(2017). Let's find out the secret of calculation-Why not the same result?- *Mathematics Education, November issue*, Meijitosho Shuppan co, 10-13.

Wilson, B. G. (2013) Chapter 5: Constructivism in Practical and Historical Context, Reiser, R. A., Dempsey, J. V., *Trends and Issues in Instructional Design and Technology*, Pearson; 3rd edition

Analyzing Factors That Promote Students' Understanding about Active Learning in Teacher Education

Yao KE
y.kaaaaa911@gmail.com
Graduate student
Kansai University Graduate School
Osaka, Japan

Kenichi KUBOTA
kubota@kansai-u.ac.jp
Professor emeritus
Kansai University
Osaka, Japan

The purpose of this research is to clarify what factors promote students' understanding about active learning in a teacher education course. The authors conducted semi-structured interviews for about an hour with Student M. After analyzing the data, five themes were generated: "Comparison with High School Classes", "Student Assistant to Encourage Active Class Participation", "Relationships with Other Students", "Activities Using Various Information Communication Technologies", and "Reflections Written in Accordance with KPT". The authors would like to propose the learning environment for teachers education to develop class using the concept of active learning in teaching courses

Key words: Active Learning, Teacher Education, Student Assistant

INTRODUCTION

It is recommended to apply active learning methods in the classroom. However, teachers at Japanese high school have still maintained “the knowledge transfer approach” (Edagawa et al. 2016). The Central Council for Education's 2012 report, "Towards a Qualitative Transformation of University Teaching to Build a New Future: Towards Universities that Foster Lifelong Learning and the Ability to Think Independently," prompted the adoption of the active learning in universities. Therefore, high school teachers were encouraged to adopt the active learning approach in their teaching. However, the teachers have still hold the traditional role of transferring knowledge to students (Kanazawa et al. 2017).

Why can't Japanese teachers discard “the knowledge transfer approach”? One of the reasons is the lack of knowledge and experience of active learning among high school teachers (Mizogami 2016). Although the teachers just follow steps of active learning written in the manual, they cannot exercise active learning in classroom. In order to implement active learning, teachers need to observe the learners' behaviors and learning environment and select appropriate supports and activities on the spot. Therefore, teachers who adopt active learning need certain experiences to be trained (Kawano 2017). Many teachers adopt teaching methods that they were taught during their school years. Therefore, teachers who have no active learning experienced may not understand how to apply active learning for their teaching (Kubota 2018).

How can teachers gain an experiential understanding of active learning? In order to achieve this, it is necessary to apply active learning in teacher education at university so that they acquire active learning skills during school time. It is important to design such learning environment that students acquire new knowledge and skills of active learning. If students learn in this learning environment, they will apply active learning in high schools when they become teachers. It is also important to provide enough opportunities for students to reflect on their learning experiences based on their classroom experiences (Kawano 2016).

The authors focused on the course in which active learning was main methods of teaching. In this course, students were able to experience active learning because there were a variety of activities students were attracted. Therefore, authors investigated which factors has strong influences to promote students' attitudes toward active learning.

CASE STUDY

The course name is "Pedagogy of Informatics" at Kansai University, Osaka, Japan. This course is a compulsory subject in order to obtain a teaching license of informatics. The objectives of the class are to gain an experiential understanding of active learning and to acquire the ability to apply information. The course is designed to promote students' participation proactively and interactively, and to help them understand active learning through their active participation. There were 27 students in 2018 when the author conducted this research. The syllabus is shown in Figure 1.

Table1：Syllabus for "Education of Informatic Science"

day	Contents	day	Contents
1st (4/9)	【Orientation】 • An overview of the class • Ice break	8st (6/4)	【Guest Lecture】 • Lecture by special guests
2st (4/16)	【What is ICT?】 • Using ICT in practice • Thinking about how ICT can be used in education	9st (6/11)	【Evaluation】 • Students think about assessment in groups
3st (4/23)	【Presentation on ICT education】 • Students form a group and present their work using a presentation tool.	10st (6/18)	【Class Design】 • How to write a lesson plan • Discuss in groups and revise lesson plans.
4st (5/7)	【Programming】 • Programming Experience • Thinking about Programming Education	11st (6/25)	【Panel discussion】 • Inviting a person who is working as a teacher to give a lecture
5st (5/14)	【Debate】 • Debate in group competitions. • Theme: "Programming Education"	12st (7/2)	【Active learning】 • Use active learning cards to rethink lesson plans from an active learning perspective
6st (5/21)	【Lesson Analysis】 • Analyze an actual high school class	13st (7/9)	【Microteaching】 • Each person has 15 minutes to conduct simulation class

7st (5/28)	【Roleplay】 • Become the role you've been given.	14st (7/16)	【The Student Assistant Experience】 • A student who wishes to teach a class as an SA
		15st (7/23)	【Summary】 • Review of all classes

The course is composed of group activities. The students can discuss with each other and create new ideas through group activities. In order to achieve this, it is necessary to provide the environment where students can actively exchange their ideas. The following three strategies were adopted for this purpose.

① Assignment of Student Assistants(SA)

This class is conducted by a team of several SAs and Teacher. SA are recruited from among students who have taken classes in the previous year. Two third-year students and five fourth-year students were recruited in 2018 when the research was conducted. The planning of the classes (selection of content and methods of teaching) is decided in consultation with SA and teachers. SA who are close to the students' age can be involved in the planning of the classes, so that they can use themes that are of interest to the students as topics for the classes. In the class, SAs take on the role of chairman and facilitator of the class. SA make it easier for students to ask questions and deepen their understanding of the class contents.

② Use of ICT tools and Active Learning classroom

Classroom are equipped with a variety of tools for students to engage in active learning. The walls of the classroom can be used as both a white board and a large screen. Lots of desk and chair can be moved around freely to allow for various types of group activities. A mobile whiteboard and a small projector can be used as needed. Each of the 50 iPads and Macbooks has Internet access and is freely available to students. Students decide for themselves how they will work on the assignments in this classroom. They then change the layout of the classroom and choose and learn ICT tools accordingly. SA will consider how to make use of these classrooms so that the students can learn independently and collaboratively. The layout of the classroom is shown in Figure 1.

③ Communication through the Learning Management System (LMS)

This class utilizes the LMS in a variety of situations. For example, students will reflect on their experience from three perspectives. The three perspectives are K (Where should we keep it?) P(What's the problem?) T(What should I try next time?). Students are required to summarize and submit the results to the LMS. The LMS adopt a chat system. This allows the students to read and comment on the reflections written by other students. Through such activities, the students realize that the students feel differently about the same class even though they are taking the same lesson. The SAs will also comment on all student reflections. This can stimulate discussions on the LMS and promote motivation for both students and SA to teach.

Students will gain an experiential understanding of active learning through the strategies listed in ①to③. and through participation in group-based classes.

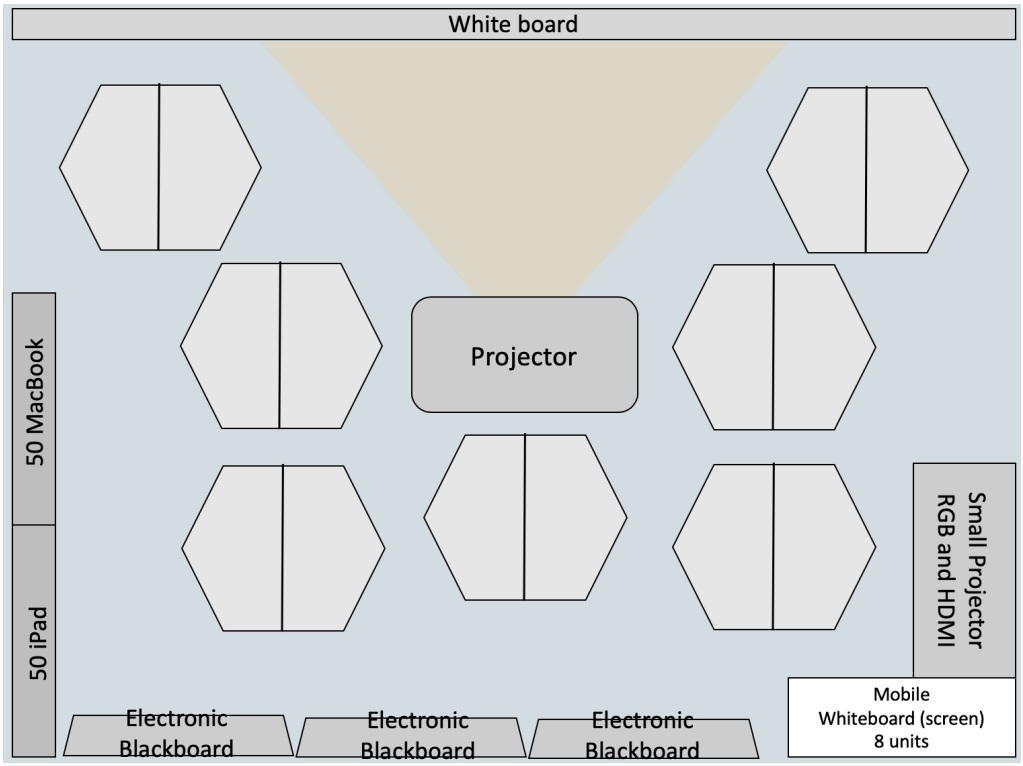


Figure1: Layout of Active Learning classroom

OBJECTIVE and METHODS

The purpose of this research is to clarify what factors promote students' understanding about active learning in a teacher education course. To this end, this study was conducted in a class for the purpose of the class are to gain an experiential understanding of active learning and to acquire the ability to apply information. This research focused on the students who participated in that class and followed the case study concept as presented by Creswell (2016). For this purpose, interviews with students and fieldnotes prepared by the author were used as analytical data. The interviews were conducted with M, a student who took the “Pedagogy of Informatics” course at Kansai University in the fall semester of 2018. Student M was selected as a research subject because he wanted to become an SA. In this class, students are invited to experience SA activities in the 14th class [The Student Assistant Experience]. Students who wanted to become SAs were more motivated to take classes. There were three applicants for this SA, and two of them refused to cooperate with us. Therefore, student M, who agreed to cooperate with us, was included in the study. The interviews were conducted after the completion of all 15 classes. The interview was conducted in about 60 minutes. The interviews were conducted in an open-ended dialogue, focusing on ①Motivation for taking this class. ②What did you learn in this class? ③Reflections on this class questions. The author and the research subject have a rapport because the author was involved with the research subject as an SA while the research subject was in the class. Therefore, the subjects of the study will be able to give their honest opinions on how they perceived this class. The interview was recorded on

an IC recorder with the interviewee's permission. The interviews were analyzed according to the analytical procedure outlined by Cresswell (2016), and the following procedure was used.

1. The author transcribed the entire recording (1 hour, 10 minutes, 59 seconds) made with an IC recorder and converted it into text data for coding.
2. The author has read the text closely many times, writing annotations in the margins, to get an overview of what is written in the text.
3. The author has intercepted the text and coded each of the sentences in the text according to their meaning. This resulted in 65 codes.
4. The author grouped similar codes, resulting in 43 top codes. The similar codes were grouped again, resulting in 19 more higher-level codes. By re-grouping them, the five themes were finally generated.
5. Finally, the author related the themes and codes and drew a conceptual diagram. The author wrote the text of the analysis based on the conceptual diagram. The conceptual diagram is shown in Figure 2.

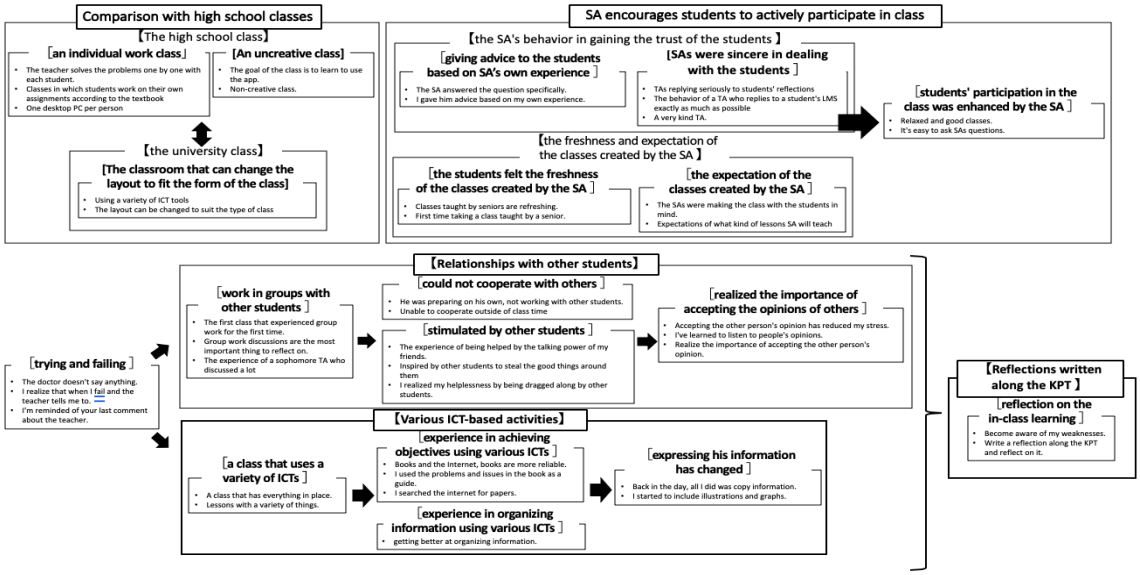


Figure2: Concept diagram

RESULTS

Based on the analysis of the interviews with the student M, the following five themes were generated. In the text and figures, 【】 indicates the theme, [ ] indicates the code, and “” indicates student comments in the interviews.

1. Comparison with high school classes

Student M recognized the ideal learning environment for active learning by comparing between the class of high school and the class of university. Reflecting on **【the high school class】**, Student M said that the high school class was **[an individual work class]** and **[an uncreative class]**. In the high school classes, each student was given a desktop PC. The class was conducted in a way that students had to work

alone on individual tasks according to the textbook. In addition, the goal of the class was to learn how to use the application. Student M felt that such a class is not creative. Student M said, “In my high school class, I had to do the assigned work by myself. Another class in high school was to learn how to use office applications. I feel like that kind of class wasn't a creative class ...”. However, Student M noticed the active learning classroom in which the 【**the university class**】 was held as **[a classroom that can change the layout to fit the form of the class]**. The reason for this recognition is that in the active learning classroom, students M could use a variety of ICT tools and change the layout of the class to suit their learning style. Student M said. **“I have been able to use a variety of ICT tools, and I think it's a very ideal classroom.” “It's wonderful to be able to choose different tools and change the layout of the classroom according to the type of learning, just like the “Chabudai” in a traditional Japanese house.”**

Active learning classrooms have a variety of ICT tools and the layout of the classroom can be changed to suit the learning style. These aspects are ideal for teaching using the concept of active learning. Student M noticed these things by comparing his high school classes with his university classes.

2. SA encourages students to actively participate in class

Student M recognized that the SA encouraged the students' active participation in the class. The reasons for this were【**the SA's behavior in gaining the trust of the students**】and【**the freshness and expectation of the classes created by the SA**】. Regarding 【**the SA's behavior in gaining the trust of the students**】, the SA **[gave advice to the students based on SA’s own experience]** in the class. The students saw such behavior of SAs and felt that **[SA were sincere in dealing with the students]**. This led the students to trust the SA. Student M said, **"SA showed me the way I should take. SA was very careful to tell me how SA had done what SA had done ...." " The SA was very specific in answering my questions. I was impressed by the fact that he gave me a concrete answer."**

With regard to **[SA were sincere in dealing with the students]**, the SA were very kind to the students; the SA politely responded to the reflections that the students wrote on the LMS. The students saw such behavior of the SA and get more motivation for the class. Student M said. "The SA were incredibly nice to me...they didn't get mad at the students' little mistakes." "The SA's comments in the reflection were carefully written and many. When I saw that, I was glad that I had worked so hard on my reflections." "SA have provided helpful links and advice in the comments on reflections. When I saw that, I really felt that he was dealing with me seriously."

Regarding【**the freshness and expectation of the classes created by the SA**】, ［**the students felt the freshness of the classes created by the SA**］and ［**the expectation of the classes created by the SA**］. Regarding **[the students felt the freshness of the classes created by the SA]**, this was the first time for student M to experience a class with SA. The students felt that it was refreshing to have SA in the class. Student M said. **“I have never taken a class with a teacher in my life, and I have never had a class taught by SA, so it was very new to me.”**

With regard to ［**the expectation of the classes created by the SA**］, Student M felt that the SA had designed the class with the students' interests. Student M was looking forward to the next class that SA will prepare for us. Student M said. **“The SA make their classes around how the students would reaction. So I was looking forward to seeing what the SA would come up with next time.”**

As a result, the students felt that the classes were relaxing and easy to ask questions to SA. Thus, **[students' participation in the class was enhanced by the SA]**. The SA for this class are recruited from students who have taken this class in the previous semester. There are various reasons for students to run for SA. Students who want to become teachers in the future often run for office to get the experience they

need to become teachers. Therefore, SA will tell on their own experiences of taking this class as a student and support their students. This can promote students' interest in the class and create an atmosphere that makes it easier for them to participate in the class. Student M realized the usefulness of SA from his experience of facilitating his participation in the class.

3. 【Relationships with other students】

In this class, students **[work in groups with other students]**. Looking back on such a class, student M said that he often found himself **[trying and failing]**. In response to such a class, student M said, **"I think failure is important. When I fail, what the teacher said will remain in my mind, so I will try to apply it to the next time. I said..."**

Looking back on the many group works of this class, student M realized his weakness: he **[could not cooperate with others]**. By being stimulated by other students, Student M **[learned to listen to their opinions]** and **[realized the importance of accepting the opinions of others]**.

Student M was not able to work with other students at the beginning of the class. Therefore, he prepared for the class on his own without collaborating with other students. Student M said, **"In this class, we have to make our own schedule and prepare by ourselves. I was not able to collaborate with other students. I was making preparations all by myself ..."** In addition, there were opportunity when the students were **[stimulated by other students]** through activities in the class. In this way, student M feel his own powerlessness and think about learning from other students. Student M said about the situation at that time. **"Mr. T has a way of speaking that grabs everyone's attention. I thought I would learn how to speak from this man."** Student M became aware of his weaknesses and learned from the other students. Thereby, Student M **[learned to listen to their opinions]** and **[realized the importance of accepting the opinions of others]**. Student M said. **"The more you accept the other person's opinion, the less stress you will experience." "I was able to develop my ability to accept the opinions of others. I think it is really important to accept people's opinions."** The reason for this change in student M is his interaction with other students in class activities.

4. Various ICT-based activities

This class is in an active learning classroom **[a class that uses a variety of ICTs].** Student M recognizes such a classroom as having a variety of ICT tools. To the active learning classroom, student M said. **"I've used a Mac and a whiteboard, and I've used a tablet and a drone."**

In such a classroom, the student M experienced **[experience in achieving objectives using various ICTs]** and **[experience in organizing information using various ICTs]**. With regard to **[experience in achieving objectives using various ICTs],** Student M compared various sources of information when he had to gather a lot of information to prepare for the debate and made a decision. Student M said. **"I thought about which sources of information I would access at different times and in different ways."**

Regarding **[experience in organizing information using various ICTs]**, student M had an experience of organizing information by using various ICTs in this class. As a result, he was able to improve his ability to organize information. About this, Student M said. **"I felt that the way of making PPTs has changed after many times of making them. I think I have improved my ability to summarize information in an easy-to-understand manner."** As a result, Student M recognizes that the way he **[expresses his information has changed]**. Student M realized that activities using various ICT tools help students to acquire the ability to convey information in a way that is easy to understand.

5. 【Reflections written along the KPT】

In this class, students write and post reflections about their in-class learning along with the KPT on the LMS after the class. It promoted the students' [reflection on the in-class learning]. Student M felt that writing reflections along with the KPT would cause him to reflect. Thanks to this, student M was able to

realize his weaknesses. Regarding this, student M said, “At first, I thought it was a rule that we had to follow to write reflections according to the KPT. But while I was doing it, I was able to organize what I learned in class naturally.” Student M realized that writing reflections in accordance with the KPT is the way to pretend each class activity.

RESULTS

This class is designed to provide students who want to become teachers in the future with an experiential understanding of active learning. To this end, the class was conducted in an active learning classroom with a variety of ICT tools. Then, the class was based on group activities and incorporated reflection using the LMS and innovations such as SA. The purpose of this research was to clarify what factors in such a class promoted students' understanding about active learning. As a result, five themes were generated: **"Comparison with High School Classes", "Student Assistant(SA) to Encourage Active Class Participation", "Relationships with Other Students", "Activities Using Various Information Communication Technologies (ICTs) ",** and **"Reflections Written in Accordance with KPT(Keep, Problem, Try)"**.

As a consideration, the following two requirements are necessary for students to have an experiential understanding of active learning. (1) Providing a learning environment that encourages a change in view of learning. (2) Opportunities for reflection on one's own learning experiences based on classroom experiences. In this class, (1) was the experience of interacting with other students, group activities, active learning classrooms, and learning by using rich ICT tools. (2) was a reflection using the LMS. Throughout the course, the presence of SAs encouraged the students to work on the class independently.

In the future Japanese education, if we can design lessons that combine various strategies such as active learning classrooms with ICT tools, SA, and reflection using LMS, students will be able to understand active learning through experience.

RESULTS

Cresserll, W. (2016). *30 Essential Skills for the Qualitative Researcher (English Edition).* SAGE Publications, Inc;.

Edagawa, Y., Tani, M., & Sato T. (2016). Influence of Active Learning on Academic Achievement and Difficulties in Its Implementation : Effective communication on Realizing of High School and University Articulation System. Bulletin of Waseda Institute for Advanced Study. 8 : 129-140

Kanazawa, M., Fujie, H., Kurisu, Y., Yoshida J. (2017) In elementary, junior high and high school lesson design and evaluation of active learning ― Using teacher’s profiency support tool ―. The journal of Kansai University of Social Welfare.20 : 91-100

Kawano. A. (2016). The Review of the Enactment of Active Learning for Pre-service Teacher Education : focusing on professional development towards the 21st learning. Bulletin of Joetsu University of Education. 35:43-55

Central Council for Education (2012). Towards a qualitative change in university education to build a new future: A university that fosters lifelong learning and the ability to think independently.

Investigating good teaching and learning experiences in the perspectives of university students through social network analysis

Suna Oh
ohsuna@gwangju.ac.kr
Professor
Gwangju University
Gwangju, Korea

Heoncheol Yun
heonyun153@gmail.com
Professor
Chonnam National University
Gwangju, Korea

Jeonghee Ryu
teodosia@gwangju.ac.kr
Professor
Gwangju University
Gwangju, Korea

This study investigated and analyzed university students' perspectives on good teaching and instructional practices through social network analysis. The subjects were 321 college students of the third and fourth years in Korea. The subjects completed the eight open-ended questions. The questions were about the experience of good instruction, good educators' instructional behaviors, and their feeling and attitudes when experiencing good teaching. As social network analysis approaches, KrKwic (Korea Key Words in Context) was used to compute word frequencies and analyze semantic networks and Ucinet Netdraw to assess centrality in the social network, consisting of degree centrality, closeness centrality, and between centrality. As good educators strive to interact and communicate with students, they appeared to focus on learning and actively participate in classroom activities. The results presented that good instructional practices supported learning experience by using adequate instances and multimedia. The findings of this study provided empirical evidence to educators that may intend to reform learning environments and teaching practices in higher education

Key words: Good teaching, Instructional practice, Social network analysis

INTRODUCTION

The purpose of this study was to conceptually explore what good teaching is in the view of college students. The definition of good teaching might be differently defined by instructors, learners, school situations. The awareness of good teaching was formed by lesson formats, student size, student's characteristics, management styles, evaluation. In addition, learner's individuality and decision-making criteria affect the definitions of good teaching (Young & Shaw, 1999). Therefore, it is a difficult thing to determine a single definition of good teaching.

Nevertheless, grasping college students' thoughts on good teaching methods and characteristics is a meaningful study (Khandelwal, 2009). In other words, it can be said that it is very important to clarify the characteristics of good classes that students naturally admit in college. This is because students-recognized good lectures certainly focus on students and learning. It is not easy to clarify the definition of such a good class. However, in order to have a good class in college, it is necessary to analyze the good class recognized by college students.

To achieve this research objective, college students were asked to write their thoughts by asking questions such as: First, write the words that come up in good class. Second, write the teaching method of the professor who has good teaching. What is students' attitude participating in a good teaching? What are the characteristics of the classes I want to take in the future?

RESEARCH DESIGN & METHODS

Subjects

For this study, from September to October 2019, eight open-ended questions on good instruction were presented to 321 college students who are attending private universities in Gwangju. The questions were about the experience of good instruction, good educators' instructional behaviors, and their feeling and attitudes when experiencing good teaching. The subjects were 141 male students (43.9%), 180 female students (56.1), and 171 third graders (53.3%) and 150 (46.7%). They majored in early childhood education, youth counseling and lifelong education, architecture, and police law administration.

Data Analysis and Procedures

University students were asked to respond to several open-ended questions for understanding how they perceived throughout class such as lessons, instructions, educators, teaching strategies, classroom climates, feelings, and thoughts from learning. Social network analysis (SNA) is beneficial for investigating these questions that include connections and relationships in the data collected from

university students. To interpret results from SNA, it implements data preparation, data analysis, and visualization.

Data analysis

The entire volume of responded texts were imported into a word-processing tool and converted to text files to run through the KrKwic (Korean Key Word in Context) and UCINET 6.

The KrKwic is a specialized social network program to analyze word frequencies, structures, and semantic network analyses of Korean language (Park & Leydesdorff, 2004). It consists of three sub-programs: Krwords, Krtitle, and Krtext. Krwords is used to extract main words and compute word frequencies from various text data. After analyzing word frequencies, Krtitle conducts semantic analyses based on relatively short sentences or messages. Krtext is used to analyze the enormous volume of Korean texts which Krwords and Krtitle are unable to handle.

In this study, we first used Krwords to find the most frequently mentioned words in students' responses. Prior to running Krwords, the texts were converted to default format files (e.g., text.txt), and the files ran through Krwords several times removing unnecessary words such as particles and connection words to find key words. At times, differently spoken words with similar meanings were manually simplified as one single word. For example, teachers, educators, instructors, tutors, and professors were coded as educators. Next, Krtitle yielded matrices including nodes and distances. For SNA in UCINET 6, we selected only 20 words for each matrix that were the most frequently mentioned and become nodes.

Matrices obtained from the KrKwic were used for SNA in UCINET 6 and visualization in NetDraw. Grunspan, Wiggins, and Goodreau (2014) noted that SNA basically intends to understand the determinants, structures, and consequences of relationships between actors, same as nodes. In SNA, the most basic measurement at network level is network density. Network density refers to a typical index that simply shows how many ties between actors are present. That is, network density is a measurement of how many links are observed in a whole network divided by the total number of links that could exist if every actor was connected to one another (Grunspan et al., 2014).

At the actor level measurement of SNA, centrality is critical measures to examine positions of nodes in the network (Grunspan et al., 2014). Specifically, centrality measures are degree centrality, closeness centrality, and between centrality (Freeman, 1977). Degree centrality means the total number of connections a node has. A node with more connections is regarded as holding most information or quickly connected with the wider network. Closeness centrality focuses on how close one actor is to other actors on average. It is a useful measure to find actors that are best placed to influence the entire network most quickly. Betweenness centrality shows whether actors serve as bridges in the shortest paths between two actors. Actors with high betweenness centrality have a high probability of existing as a link on the shortest path between any two actors in a network.

Visualization

After SNA in UCINET 6, we used NetDraw to visualize social network data. NetDraw is a useful technique bundled with UCINET 6 to graphically identify and represent patterns of connections, relationships, and interactions between nodes (social entities or individuals).

RESULTS

This study investigated what university students think about good class, effective teaching strategies, students' attitudes, and the most wanted class next time, using SNA through UCINET 6 and NetDraw. For each category, the results from SNA follows.

Words describing good class

Table 1 displays the list of words as students wanted to choose a single word in order to depict good class they had taken. Based on SNA, 20 keywords and its density and centrality exhibit. According to density, students chose 'understanding', 'example', 'video', 'interest', and 'communication' as listing top 5 words. The results of degree centrality shows that 'understanding', 'example', 'contents', 'fun', and 'explanation' have large values. Next, closeness centrality indicates that 'understanding', 'example', 'video', 'interest', and 'communication' are the most critical keywords. Lastly, betweenness centrality presents that 'understanding', 'communication', 'feedback', 'interest', and 'video'.

Table 1. List of Words Describing Good Class

Keyword	Density	Degree Centrality		Closeness Centrality		Betweenness Centrality	
		Value	Rank	Value	Rank	Value	Rank
understanding	17	75	1	0.905	1	14.012	1
example	15	47	2	0.826	2	7.095	6
video	15	37	6	0.826	2	7.343	5
interest	15	31	7	0.826	2	7.727	4
communication	14	28	9	0.792	5	12.266	2
fun	13	39	4	0.760	6	4.658	8
participation	13	23	10	0.760	6	5.509	7
feedback	12	20	12	0.731	8	8.391	3
materials	11	30	8	0.704	9	1.321	15
focus	11	23	10	0.704	9	3.627	10
explanation	10	39	4	0.679	11	2.070	12
contents	10	43	3	0.679	11	1.323	14
media	9	13	14	0.655	13	1.745	13
assignments	8	20	12	0.633	14	0.345	18
classroom climate	8	13	14	0.633	14	2.236	11
Classroom management	8	8	16	0.633	14	4.642	9
opinions	5	6	17	0.576	17	0.167	19
retention	5	6	17	0.576	17	0.125	20
interaction	5	5	20	0.576	17	0.658	17
discussions	4	6	17	0.559	20	0.742	16

Features enriching effective instructions

Table 2 shows the list of words if students picked a keyword to describe good educators' teaching styles, strategies, and critical features. First of all, density shows that 'assignments', 'questions', 'understanding', 'example', and 'feedback' are important. Among the results of centrality, 'assignments', 'evaluation', 'questions', and 'feedback' are top 5 keywords in degree centrality. Next, closeness centrality presents that the same top 5 keywords like density are presented. Last, betweenness centrality provides 'assignments', 'understanding', 'questions', 'example', and 'unique' as top 5 keywords.

Table 2. List of Words Describing Good Educators' Instructional Strategies

Keyword	Density	Degree Centrality		Closeness Centrality		Betweenness Centrality	
		Value	Rank	Value	Rank	Value	Rank
assignments	16	115	1	0.864	1	19.821	1
questions	16	42	4	0.864	1	15.391	3
understanding	16	67	2	0.864	1	18.372	2
example	12	32	8	0.731	4	10.793	4
feedback	11	38	5	0.704	5	4.313	6
unique	11	16	14	0.704	5	6.860	5
participation	10	19	11	0.679	7	4.226	7
focus	9	10	15	0.655	8	3.294	8
collaboration	9	35	7	0.655	8	2.586	9
video	9	36	6	0.655	8	1.945	11
applications	8	18	12	0.633	11	1.380	13
evaluation	8	54	3	0.633	11	0.993	15
discussions	8	20	10	0.633	11	2.047	10
fun	8	18	13	0.633	11	1.121	14
exams	7	27	9	0.613	15	0.452	18
effort	6	8	18	0.594	16	1.561	12
friendly	6	9	17	0.594	16	0.950	16
communication	6	6	20	0.594	16	0.458	17
review	5	8	19	0.576	19	0.236	19
preparation	5	10	16	0.576	19	0.200	20

Students participating in good class

Table 3 indicates the list of words when students participated in good class to describe their attitudes, feelings, and thoughts. Based on the results of density, 'active', 'participation', 'focus', 'listening', and 'asking' are top 5 ranked. Students were 'active', 'focusing', 'participating', 'listening', and 'responding' according to degree centrality. Next, closeness centrality shows that 'active',

‘participation’, ‘focus’, ‘listening’, and ‘asking’ mark top 5 high values. Lastly, betweenness centrality displays ‘active’, ‘participation’, ‘focus’, ‘listening’, and ‘asking’ like density.

Table 3. List of Words Describing Students Participating in Good Class

Keyword	Density	Degree Centrality		Closeness Centrality		Betweenness Centrality	
		Value	Rank	Value	Rank	Value	Rank
active	17	86	1	0.905	1	27.160	1
participation	17	81	3	0.905	1	26.410	2
focus	15	86	1	0.826	3	15.843	3
listening	15	60	4	0.826	3	12.226	4
asking	12	27	7	0.731	5	7.100	5
responses	11	30	5	0.704	6	3.650	7
hardworking	9	29	6	0.655	7	2.800	8
attitude	9	16	9	0.655	7	5.183	6
note-taking	9	18	8	0.655	7	1.117	10
reaction	7	13	12	0.613	10	0.310	14
positive	7	14	11	0.613	10	0.700	11
laughing	6	13	12	0.594	12	2.200	9
understanding	6	8	14	0.594	12	0.200	15
collaboration	6	16	9	0.594	12	-	
interest	6	7	16	0.594	12	0.510	13
cell-phones	4	7	16	0.559	16	-	
proactive	4	4	19	0.543	18	0.593	12
communications	4	8	14	0.559	16	-	
no missing	3	5	18	0.528	20	-	
activities	3	4	19	0.543	18	-	

Class most wanting

Table 4 presents the list of words depicting desirable class which students most wanted to tak e next time. According to the results of density, students were interested in ‘assignments’, ‘rewar ds’, ‘understanding’, ‘difficulty’, and ‘interest’. Next, degree centrality presents that ‘assignments’, ‘difficulty’, ‘exams’, ‘rewards’, and ‘understanding’ are top 5 ranked. Closeness centrality indicate s that ‘assignments’, ‘rewards’, ‘understanding’, ‘interest’, and ‘difficulty’ have the highest values from the top. Lastly, betweenness centrality shows that ‘rewards’, ‘understanding’, ‘meaningful’, ‘group activities’, and ‘exams’ are the most powerful top 5 keywords.

Table 4. List of Words Describing Students’ Most Wanted Class

Keyword	Density	Degree Centrality		Closeness Centrality		Betweenness Centrality	
		Value	Rank	Value	Rank	Value	Rank
assignments	14	45	1	0.792	1	9.070	6
rewards	11	17	4	0.704	2	153.233	1
understanding	10	15	5	0.679	3	64.077	2
difficulty	9	25	2	0.613	5	7.511	9
interest	9	13	7	0.633	4	8.769	7
exams	9	22	3	0.613	5	15.927	5
useful	8	15	5	0.576	10	7.861	8
group activities	8	11	11	0.576	10	19.333	4
fun	7	12	9	0.594	8	1.135	17

explanation	7	8	13	0.594	8	2.435	14
meaningful	7	11	11	0.613	5	35.827	3
applicable	6	6	15	0.528	13	1.667	15
retention	6	7	14	0.576	10	4.476	12
focus	5	5	17	0.500	14	3.893	13
classroom climates	4	13	7	0.463	17	1.393	16
agreeable	3	3	18	0.487	15	4.643	11
expertise	3	12	9	0.475	16	0	19
respectful	3	6	15	0.452	18	0	19
grade	2	2	19	0.432	19	5.500	10
life	1	2	19	0.388	20	0.250	18

Visualization of social network data

UCINET 6 provided the statistical results from SNA based on density and three centrality measurements. NetDraw under UCINET 6 helped to visualize the social network data we already analyzed and Figure 1 exhibits the graphical structures of social network data in each category with top 5 ranked keywords in density (in a rectangular shape).

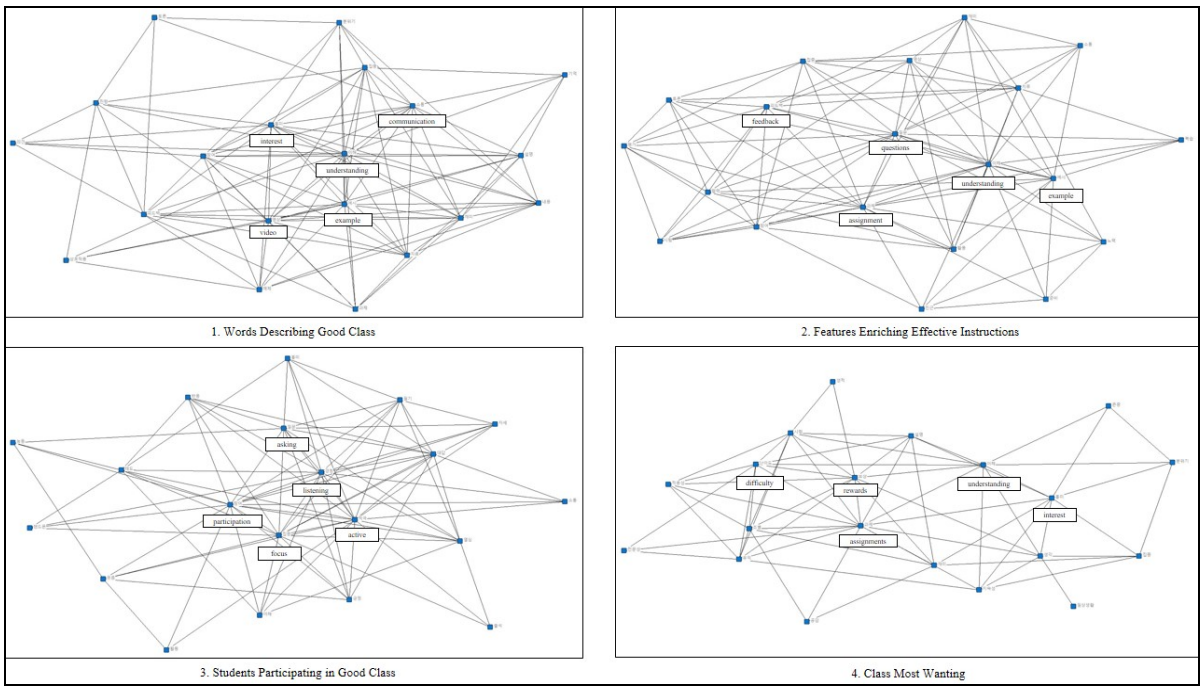


Figure 1. Visual Structures of Social Network Data (from top left corner to right, 1. Words Describing Good Class and 2. Features Enriching Effective Instructions and from down left corner to right, 3. Students Participating in Good Class and 4. Class Most Wanting).

DISCUSSION

This study aimed to understand what university students think about good class such as keywords, educators' instruction, feelings, thoughts, and ideas regarding good class and the most wanted class they wanted to take next semester. Results and findings from this study can provide significant insight in providing future students with good class, especially in terms of teaching, instructional design, content

expertise, communication, interaction, learning materials and so on. Thus, several findings from this study are indicated to support teaching and learning as following.

First, good class can be meaningful to students as they understand learning content in effective ways. Literally, although good class to students means to be subjective, students may want to learn effectively through appropriate examples. Multimedia like video appears to be preferable to use in the classroom. As a motivational perspective, learning can be effective when they are interested in learning. Communication and feedback among educators and peers in the classroom could be critical for successful learning experience.

Second, educators need to consider several aspects to provide successful learning experience to students. Importantly, students seem to be very interested in assignments. If difficult or many assignments are given, it may lead to the decrease of motivation and interest in learning and completing assignments. Similarly, evaluation should be clear and fair to every student. Educators' priority could be helping students to understand what they are learning. Also, educators need to use their own teaching methods, styles, and strategies because students would be bored with boring learning materials. Likewise, educators can create student-centered learning, giving questions and feedback to facilitate active participation in learning.

Third, students appear to be active learners when participating in good class. Active students tend to ask questions actively and listen to responses and feedback from educators and other classmates while learning. Also, active students could be seen as hard-working and positive learners. In turn, their attitudes in learning and working with others will be connected to successful learning performance.

Lastly, good class can result in positive outcomes to students. Simply, they wanted to learn through good class next semester. Assignments and difficulty of learning contents appear to be their first concerns to register a class. Exams are another crucial concern to them because results of exams have critical impact on GPA. Overall, they strongly wanted to experience meaningful learning and make knowledge applicable to other situations like rewards given to them after finishing class.

REFERENCES

Freeman, L. C. (1977). A set of measures of centrality based on betweenness. Sociometry, 35-41.

Grunspan, D. Z., Wiggins, B. L., & Goodreau, S. M. (2014). Understanding classrooms through social network analysis: A primer for social network analysis in education research. *CBE-Life Sciences Education, 13*(2), 167-178.

Khandelwal, K. A.(2009). Effective teaching behaviors in the college classroom: A Critical incident technique from students' perspective. *International Journal of Teaching and Learning in Higher Education, 21*(3), 299-309.

Park, H. W., & Leydesdorff, L. (2004). Understanding the KrKwic: A computer program for the analysis of Korean text. *Journal of the Korean Data Analysis Society, 6*(5), 1377-1387.

Young, S., & Shaw, D. G.(1999). Profiles of effective college and university teachers. *The Journal of Higher Education, 70*(6), 670-686.

An Alternative Form of Informal Learning Using ICT

Ryota Yamamoto
ryota@iii.u-tokyo.ac.jp
Project Assistant Professor
The University of Tokyo
Tokyo, Japan

The university students had been learning through formal and informal learning settings on and off-campus. Students are participating in group activities, volunteer activities, or project activities in parallel with their course studies. And they are acquiring various skills through the experiences in these activities. However, in the situation that novel coronavirus is spreading, informal learning activities are restricted by the universities to prevent the spread of infection. The author discusses how promote informal activities even in the situation of novel coronavirus is spreading. This paper shows an informal learning activity that the author has guided since April 2020 as a case study. In this case, the students had launched a crowdfunding project for helping the people in a poor community in the Philippines. An interview will be conducted for the students who had implemented this activity and analyzed what learning outcomes can be acquired. Finally, how alternative forms of informal learning and its support can be conducted is discussed.

Key words: Informal Learning, ICT, University Education, Crowd Funding

INTRODUCTION

Informal learning in universities

The university students had been learning through formal and informal learning settings on and off-campus. They are participating in group activities, volunteer activities, or project activities in parallel with their course studies. And they are acquiring various skills through the experiences in these activities.

YAMADA and MORI (2010) mentioned eight generic skills that university students have acquired when they graduate; Critical thinking/problem solving, Social skills, Sustainable learning/social involvement, Knowledge systematization, Information literacy, Foreign language skills, Native language skills, Self-presentation. The results of a t-test conducted on the differences between formal curricula and extra-curricula showed that extra curricula had a higher score than formal curricula in Social skills, Sustainable learning/social involvement, Knowledge systematization and Self-presentation. TOKITO and KUBOTA (2011) reported the teaching skills acquisition through teaching assistant experiences in a high school. It showed that the participants constructed the specific knowledge and minds to be a teacher, for example, a) aspects of lessons and b) knowledge of lessons.

These studies showed that students can acquire generic skills and specific knowledge in each domain through informal learning activities. And opportunities of interaction with beneficiaries or collaborators as a learning environment are important for informal learning.

The problem of promoting informal learning in the novel coronavirus spreading

However, in the situation that novel coronavirus is spreading, both formal and informal learning activities are restricted by the university to prevent the spread of infection. Although universities have delivered online formal lessons, there is no discussion on how informal learning support can be conducted.

Many Japanese universities have resumed lectures as of July 1 (Table 1). However, more than 85% of colleges and universities continue to offer online lectures (Table 2). Correspondingly, approximately 85% of colleges and universities do not allow students' campus activities except lectures and some learning activities (Table 3). In other words, students' informal learning activities are restricted. Students who are restricted from campus activities have difficulty engaging in informal activities.

Table1 Status of Class Implementation as of July 1

	In practice	In suspension
National universities	86 (100%)	0
Prefectural and municipal universities	102 (100%)	0
Private universities	824 (100%)	0
Higher professional school	57 (100%)	0
Total	1069 (100%)	0

Table2 Status of Class Implementation Methods as of July 1

	Face-to-face at campus	Combination (Face-to-face and online)	Online
National universities	1 (1.2%)	55 (64%)	30 (34.9%)
Prefectural and municipal universities	8 (7.8%)	72 (70.6%)	22 (21.6)
Private universities	145 (17.6%)	492 (59.7%)	187 (22.7%)
Higher professional school	19 (33.3%)	23 (40.4%)	15 (26.3%)
Total	173 (16.2%)	642 (60.1%)	254 (23.8%)

Table3 Status of Availability of On-campus facilities of July 1

	Disapproved	Partially approved (lecture only)	Partially approved (lecture and some activities)	Approved
National universities	0	34 (39.5%)	40 (46.5%)	1 (1.2%)
Prefectural and municipal universities	1 (1.0%)	39 (38.2%)	50 (49.0%)	9 (8.8%)
Private universities	16 (1.9 %)	279 (33.9%)	227 (40.9%)	144 (17.5%)
Higher professional school	1 (1.8%)	17 (29.8%)	26 (45.6%)	6 (10.5%)
Total	18 (1.7%)	369 (34.5%)	453 (42.4%)	160 (15.0%)

Research objective

Universities in Japan have been providing support to promote informal learning by setting the Learning Commons. Therefore, universities need to consider how they can promote informal learning along with formal learning activities and take steps to support this. Even in the context of novel coronavirus spread, the university needs to maintain support so that students can benefit from the various learning benefits brought about outside of the formal learning settings.

This study takes a case study that the author has helped. This case study is an example of students launching a crowdfunding project to support the poor in the Philippines. The crowdfunding project can be conducted in an online learning environment, and the participants must experience interaction with collaborators. Therefore, it can be a case study in this situation. Interviews with students who participated in the project are qualitatively analyzed to show what learning experiences and the learning outcomes acquired in this project. We then discuss the forms of informal learning that are possible in situations where students' actions are limited and how they can be supported.

Definition of informal learning

OECD (2010) presents the characteristics of formal, non-formal and informal learning as shown in Figure 1. Formal learning refers to intentional, structured and controlled learning situations provided by educational institutions (Table 4). On the other hand, informal learning in a narrower sense is unintentional, unstructured, and uncontrolled. University-supported informal learning is intentional and structured, although not strongly structured, in that students interact with a variety of off-campus actors. Therefore, it is strictly a non-formal learning process. However, in this paper, it is defined as informal learning in the broadest sense of the word to emphasize the difference between it and formal education at the university.

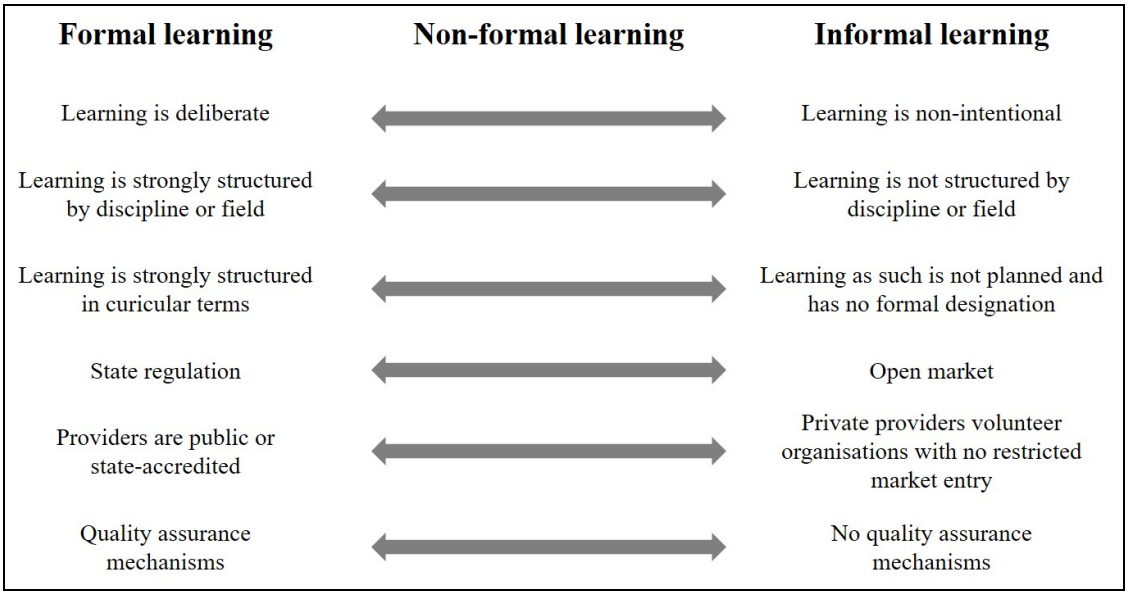


Fig.1 Characteristics of formal, non-formal and informal learning

Table4 Difference of learning contexts between formal, non-formal and informal learning

Formal learning	Non-formal learning	Informal learning
Intentional	Intentional	Non-intentional
Structured	Structured	
Controlled		

METHOD

Case study: Online crowdfunding project

The case study is a crowdfunding project launched by two students that ran from April to the end of June 2020. The goal of this project is to provide supplies to mothers and children living in poor communities in Lapu-Lapu City, Cebu, Philippines, affected by the spread of the novel coronavirus.

The province of Cebu, Philippines, has adopted an Enhanced Community Quarantine policy (ECQ) effective March 27, 2020, and has entered a state of lockdown (Sugbo News 2020). Under the ECQ, the city government provided supplies to citizens, but only rice and other commodities, such as nutritional supplements for infants, and sanitary products for women, were not included. Although Cebu Province transitioned to a General Community Quarantine policy (GCQ) effective May 16, 2020 (IATF 2020), which allows for the purchase of goods, support for mothers and children is still needed as residents of poor communities are often work as a casual worker. Then, the students began preparing a crowdfunding project in early April to raise money for the purchase of relief supplies in the targeted areas, which ran from May 28 to June 25, 2020. Local NPO is responsible for providing supplies in this area.

In this crowdfunding project, the founder of the local NPO and the author assisted the students. Specifically, they proposed the launch of the crowdfunding project, provided information and assistance in making decisions on what to support, provided information and assistance in writing articles for the website of the project, and assisted in gaining supporters. The founder of the local NPO and the author have previous experience in implementing crowdfunding.

The author shows how students learned from their experiences in the process of carrying out the crowdfunding project. The author then discusses the forms of informal learning and the support that are possible in situations where students' actions are limited.

Data collection and analysis

To collect the data, the interview with the students who implemented the project was conducted in early July 2020, after the end of the crowdfunding project period. The interview was recorded using Zoom, a web conferencing system, with a recording feature. The interviewee was asked about their experiences during the preparation of the project (deciding what to support, creating website articles) and during the project implementation period, what they learned from it, and what they expected to do after the project implementation period. The interview lasted approximately 45 minutes. The students' statements during the interviews were transcribed and used as data for analysis.

The data were analyzed based on qualitative data coding. Specifically, they were interpreted from the perspective of the research question, “what did the students experience in the process of the crowdfunding project, and what did they learn from them?”, and coded. Finally, the categories that consisted by corresponding codes were created.

RESULTS

Learning outcomes from experiences during the project preparation

The students who launched their crowdfunding projects were "building knowledge about project management" or acquiring "specific expertise". When setting up a crowdfunding project, it is necessary to present a concrete plan with feasibility to supporters in advance on the website for what specific activities will be carried out after the funding success. By experiencing the process, the students were building their knowledge of project management.

In designing specific activities, it is also necessary to acquire knowledge of the poor community and people in that community, specifically they must acquire knowledge of laws and regulations related to the provision of goods. In this case, they had planned to provide powdered milk to infants, but during the planning process, they learned that the Philippine Government prohibits the donation of powdered milk (Philippine Commission of Woman n.d.), so they had to change the content of the supplies provided. This experience showed that the students had acquired “specific expertise.”

Table5 Result of qualitative data analysis

Categories	Codes
Learning outcomes from experiences during the project preparation	
Knowledge construction regarding project management	Insights into the need for specific planning of activities
Acquiring specific knowledge	Acquiring knowledge of local laws and regulations
	Acquiring knowledge of the local culture and customs
	Writing skills for a crowdfunding that is not experienced in formal lecture
Learning outcomes from experiences during the project implementation	
Acquiring social communication skills	Building knowledge regarding expressions for appealing support
	Building knowledge regarding communication strategies for appealing support
	Experiencing difficulties in coordinating with CF management companies and collaborators
Forming attitude to structure social network	Forming active communication attitude to expand community of supporters
	Recognizing the importance of strengthening connections
	Actions to enhance on-site support
Acting based on social responsibility	Acting on a sense of responsibility to achieve the target amount
	Acting on a sense of responsibility to complete the project
Resilience	Experience overcoming stress
Perspectives after the project implementation	
Enhanced ambition for own activity	Enthusiasm for the development of future activities based on a deep understanding of the region
	New discoveries of public interest
Ambition for expanding social network	Strengthen relationships with local partners

Learning outcomes from experiences during the project implementation

Four learning outcomes were identified in the activities during the project implementation period. The first was “social communication skills.” Students had devised ways to communicate on social networking sites to drum up support for the crowdfunding project. They also acted as communication intermediaries between the crowdfunding site management company and the founders of a local NPO that were working with them. Through these experiences, I was learning the skills to establish communication with people with different ideas.

The second is the attitude towards building a social network. The cooperation of various people is essential for the achievement of the crowdfunding project. Therefore, during the implementation period, a positive attitude towards communicating with many people and building a network was formed.

Third, it is a “socially responsible action.” One of the risks of crowdfunding is that if the target amount is not met, the activities originally planned cannot be implemented. In this case, the support for mothers and children in the poor community would be limited. In order to avoid this, the students took responsible actions for their achievements. For example, they appeared in a live stream produced by a YouTuber who disseminated information about the Philippines.

Finally, “resilience” was acquired. The experiences described above had caused students a great deal of stress. However, by overcoming them, students were gaining resilience.

Perspectives after the project implementation

After the successful completion of the crowdfunding project, the students showed “increased enthusiasm for the activities” and a “desire to expand their social networks”. Concerning the former, even before this crowdfunding project started, the students had already implemented or planned to implement activities to produce fair trade products and improve women's hygiene in this poor community. Through this crowdfunding project, they have gained a better understanding of the local community and strengthened their enthusiasm for the activities they had originally planned and implemented.

In addition, through this project, they had many opportunities to communicate with the founders of local NPO with whom they had been working, and they were motivated to build a stronger relationship.

DISCUSSION AND FUTURE DIRECTIONS

Through this crowdfunding project, it was found that the students had achieved a variety of learning outcomes. It could also be related to their ability to form social relationships, sustained learning and social participation, systematic understanding of knowledge, and self-expression (Yamada and Mori 2010), or specific domain of knowledge and attitudes (Tokito and Kubota 2011), which were mentioned in previous studies. Therefore, crowdfunding may be beneficial as one of the activities that are possible even in the situation of limited activities under the conditions of novel coronavirus spread.

However, in order to implement a crowdfunding project and make it a success, it requires the support of funding experts or experienced supporters. In this case, the founders of the local NPO with which they collaborated and the author supported the project based on their previous experience, but if not, the learning outcomes may not be achieved as expected. Therefore, the development of the learning environment, including learning supporters, will be an important issue.

In the future, it will be necessary to confirm whether similar learning outcomes have been achieved among students who have planned and conducted various informal learning activities, such as online workshops and seminars, which have been undertaken in the context of the spread of the novel coronavirus. Building on these studies, there is a need to accumulate knowledge in learning environments and methods to guarantee and promote informal learning.

REFERENCES

IATF (2020) Inter-Agency Task Force for the Management of Emerging Infectious Diseases Resolution No-37. https://www.officialgazette.gov.ph/downloads/2020/05may/20200515-IATF-RESOLUTION-NO-37.pdf (Accessed 2020-7-27)

Ministry of Education, Culture, Sports, Science and Technology (2020). Implementation of classes at universities and other institutions based on the situation of the novel coronavirus infection (as of July 1, 2020). https://www.mext.go.jp/content/20200717-mxt_kouhou01-000004520_2.pdf (Accessed 2020-7-27)

Philippine Commission of Woman (n.d.) Executive Order No. 51 National Code of Marketing of Breastmilk Substitutes, Breastmilk Supplement and Other Related Products. https://www.pcw.gov.ph/law/executive-order-no-51(Accessed 2020-7-27)

Sugbo News (2020). An order placing the province Cebu under a state of enhanced community quarantine. https://www.facebook.com/sugbonews.gov/photos/pcb.1331999053651789/1331992850319076/?type=3&theater (Accessed 2020-7-27)

Tokito, J., & Kubota, K. (2011). The effect and factor of experiencing teaching assistant in high school to teachers' capabilities. Japan Journal of Educational Technology, 35(Suppl.). pp. 125-128

Yamada, T. & Mori, T. (2010). Role of regular- and extra-curricula on generic skills of university students from the students' viewpoints. Japan Journal of Educational Technology, 34(1). pp. 13-21

Bringing personal meanings to education - Designing education during and after COVID-19

Yoshiro Miyata
miyata@sist.chukyo-u.ac.jp
Professor
Chukyo University
Toyota, Japan

Masaki Fukushima, Maho Suzuki
t417044@m.chukyo-u.ac.jp, t418033@m.chukyo-u.ac.jp
Undergraduate student
Chukyo University
Toyota, Japan

In our modern society, personally meaningful contexts have been suppressed in our schools and workplaces. During the COVID-19 pandemic, while the economy measured by GDP has been diminishing, many people who stay home are discovering values of what they can do at home. We may call these values "gross domestic products" or gdp using the word "domestic" in its original meaning of "at home". In this paper, we will start with a discussion of how our emotions essential for learning like curiosity and challenge, and emotions necessary to maintain our society like motivation to contribute have become increasingly difficult to function. These difficulties can be associated with the change in our values that shifted from gdp to GDP in recent years. In our university, an online course in which students participate from their homes has brought an interesting opportunity to bring some personal contexts meaningful to themselves into the classroom. We will try to find out what this opportunity will bring to their learning by designing activities in which they collaboratively create expressions to share something meaningful in their own communities.

Key words: Creative Collaboration, Personal Meaning, GDP, COVID-19

GDP vs LDP

While people stay home during the current COVID-19 pandemic, many have discovered new values at home such as spending time with families, reading books, playing musical instruments, and making daily necessities with our own hands using local resources, like cooking, farming and DIY. The values of these activities with personal meanings at home or in local communities have been suppressed in most schools and workplaces, in order to maximize productivity typically measured by GDP (or grades in schools). We may call these values with personal meanings LDP, or "local domestic products" using the word "domestic" in the original meaning of "at home".

In this pandemic in which many people stay home, GDP's are decreasing while gdp's can be increasing. Our societies have been trying to maximize GDP using copiable values suitable for mass production and consumption but what if our values shift from GDP to LDP? The uncopiable values of LDP are more meaningful in our daily lives in our own homes and communities than the values measured by GDP like mass produced products we buy and consume. If many of us discover these values, it may affect our behaviors even after the pandemic is over, producing more things by our hands using local

resources and sharing with local people, instead of buying and consuming mass-produced products. A shift from GDP-maximizing society to a LDP based society can have many positive effects, such as less energy consumption, CO^2 emissions, pollutions, and more effective use and management of local resources such as forests and farm products, which can have many desirable consequences in our local and global communities.

History of LDP vs GDP

In this chapter, we will look into the history of human species to understand how our societies have come to be dominated by the values based on GDP.

Table 1 History of GDP and LDP

Society Type	Length	Products	GDP vs LDP	Values
Hunter Gatherer	**2,000,000 years**	**Hand tools**	**LDP**	**Just the right size, Empower people**
Farming	**Less than 10,000 years**	**Cities, Buildings, Societies**	**LDP + GDP**	**The bigger/more the better**
Industrial	**Less than 300 years**	**Machines**	**GDP >> LDP**	**Less human power**

Table 1 summarizes the kinds of products, values in each of the major types of societies that have appeared in the history, Hunter-Gatherer Society, Farming Society, and Industrial Society. The lengths of these society types indicated in the second column varies in different societies because a shift from one type to the next can take hundreds or thousands of years, and different types co-existed in any one area. It should be noted that at least more than 99% of the history all societies were hunter gatherer ones. In these societies, the products were hand tools designed, crafted and used by hands using local materials for the survival of the producers, their families and communities in the natural environments in which they lived. There is no doubt that producing what we need for living has been our major value through most of the human history. The values of the products were judged by whether they had enough to support themselves. Too much or too many products was not desirable for their nomadic lifestyle in which they constantly moved from one place to the next. Thus, these societies were based entirely on LDP, in the true sense of "domestic". The question is how GDP appeared in the history and has come to dominate the industrial societies as discussed above. We would like to use the term "GDP" not necessarily in the sense used in the modern economics, but in the sense of how people judge the values of what they produce. In the farming society before industrialization, the farmers (or producers in general) produced their own foods by their hands while some portion of the products were consumed by people who did not

produce their foods but managed the society itself – in other words, they produced buildings, towns, cities, and nations, not by their own hands, but by managing the people and resources in the society. Later in the history, these consumers became the elite class like the kings, politicians, nobles and merchants. What differentiated these producers and consumers seems to be how they judged their products. So, the farmers in these societies judged their products (foods and tools) by *how well they served the lives of their families and communities*. There was no value in producing more than they could eat or use, except that they had to produce some extra to support the elite consumers. On the contrary, if we look at the products of the consumers like the pyramids and the large cities with huge buildings like churches and palaces with population of hundreds of thousands of citizens, they seem to have judged their products by *how large they are.* We would like to contrast between the major values of the producers "*just enough to support themselves*", and the major value of the consumers "*the bigger/more the better*". This is how we would like to differentiate between LDP, which is based on *how well it supports the producers*, and GDP, which is based on *how much they produce*. Another important difference between the two is that in a LDP based society like hunter-gatherer societies or the producers in the farming society the tools were designed to "*empower people*" while in a GDP based society like the industrial society, many tools like the large machines in factories or electrical appliances in the homes like air conditioners or microwaves are mostly designed to "*use less human power*", while some hand tools that support LDP like knives, needles, saws and hammers, or bicycles are designed to "empower people". It is interesting to note that personal computers were envisioned as a tool to empower people but they are often used and perceived as a tool to "reduce human work" especially when equipped with AI.

History, Values and Emotions

We have seen how our history, values and tools shape each other. The values of the people shape the tools they produce, which in turn constrain the actions that people who use the tools can take, which in turn shape the society, which in turn shapes the values based on which people live. What connects the values and actions is human emotions. According to the Urge Theory (Toda, 1984) our emotions evolved as a system of urges to survive in natural environments in the hunter-gatherer societies during millions of years of the history. An urge is a set of emotion and actions that urges one to behave in ways to optimize the chance of survival in specific situations. For our argument, we focus on two kinds of urges, Learning Urges and Social Urges.

Learning Urges: emotions necessary for learning, such as curiosity and challenge

Social Urges: emotions necessary for society, such as appreciation and contribution

We feel curious when something interesting is partly visible. We feel challenged when we think our actions may achieve something valuable. We feel appreciation when we see someone or something that support oneself. Thus, the subject of urges is constrained by our values which make us pay more attention to certain things than others. This may explain why the new value "the bigger/more the better" seem to have emerged after we started farming and eventually led us to the GDP based society. In a

hunter-gatherer society, people would focus on their tools. Farming enabled some community members to consume without producing, who started to focus on building the community itself. We will leave more detail discussion about the history of GDP to another paper.

Education based on LDP

In schools in our GDP based society, students are supposed to study copiable knowledge as they are instructed according to pre-defined curricula rather than uncopiable personal interests and meanings. There are many claims that such system was designed after the industrial revolution to train workers in mass production labor to do routine works effectively (Robinson, 2009, for example). Although the actual history of schools cannot be summarized in such a single story (Dorn, 2011, for example), maintaining GDP, both in the sense of financial management and in the sense of students' learning outcomes, seems to be a major factor driving the school operation.

What would education look like in societies in which LDP is valued rather than GDP? Because learning urges like curiosity and challenge evolved to survive by creating and using hand tools in natural environments, they are most naturally directed toward personally meaningful objects. Students in our university tend to direct their learning urges to personally meaningful activities like playing sports, music and games, and many of them try to get course credits with minimal efforts in order to graduate. In online classes in the COVID-19 pandemic connecting students (and teachers) in their homes, their environments with personal meanings can be more visible, which tend to be suppressed in classrooms, showing a potential to break the barriers between homes and classrooms and bring more authentic learning with personal meanings to education.

Creative Collaboration Course

This COVID-19 pandemic brought an unexpected opportunity to bring the students' contexts with personal meanings. In our university all courses in the spring semester are being conducted online. In a freshmen course titled "Creative Collaboration" in the Department of Media Engineering in the School of Engineering, we are collaborating with primary students in Hokkaido to create Scratch projects for the purpose of supporting education for children in Egypt. In previous years, we successfully activated students' learning urges by first activating their social urges in a collaboration project with partners outside university (Miyata, Sugiura, Kamei, 2013).

This year, we had originally planned to create Scratch projects online and collaborate online with the children in Hokkaido, so there was nothing in the contents to be changed when we had to conduct the course online, except that the primary school did not start until June and we could not start collaboration until July. Also, in previous years the university students shared their university campus to the primary students by creating animations using photos they took on and around campus. This year they had to take the class online from their homes so we decided that they share the communities they live in instead of

the campus. This made a rare opportunity to bring their contexts with personal meanings which would be difficult in a classroom.

We designed the activities based on the principles of activating students' learning urges and social urges. We divided the freshmen into two classes of 37 and 30 students, respectively. The class started in May and will end on Aug 3. The class has been going as described below:

1. We told the students about the collaboration with the primary students and showed them the projects from previous years.
2. We had planned to activate their social urges by communicating with the primary students online but this was not possible because the partner school had not opened yet. So, we designed activities to activate their learning urges instead. The students viewed some materials in the online program "Learning Creative Learning" organized by Lifelong Kindergarten Research Group at MIT Media Lab. After watching some videos and reading some texts about "learning with passion", many students commented positively on this theme.
3. On the third week, the students divided themselves into groups of 3 to 6 according to their passion in four genres "Animation", "Game", "Music" and "Story". Each student created a Scratch project in her/his genre. Even though it was their first experience in Scratch programming, in order that the students work on the basis of their learning urges, we did not give any instructions as to what nor how to create, except a very simple demonstration of how to operate the Scratch programming environment. They looked at example projects in the Scratch website and tried to create whatever they felt curious and challenged to create within their genre.
4. Each 90 minute class meeting started with a 10-15 minute online session with everyone in the class including the LAs to explain the activities we had designed for the day. Then the students gathered in group sessions in which they worked on their projects, shared them and discussed as necessary. They shared what they were trying to create on an LMS forum within each group. We watched their progress in each group forum and tried to give specific advises to individual projects on how to achieve what they were trying to do, commenting in their forum. For example, when someone was creating many sprites (characters) with identical scripts (programs) we advised that exactly the same effect can be achieved by using the "clone" function of Scratch with one sprite so that it was not necessary to keep copying a modified script to all the sprites. These advises seemed to spread to other members in the group who were watching the forum. They started to learn from each other: they watched what other group members were doing and some members started to give advises to other group members, indicating their social urges. One student in the music group who had just learned how to play a single melody mentioned that she saw other members playing chords and would challenge playing some chords, indicating a learning urge (curiosity and challenge).

5. From the 6th to the 8th week, each group collaborated to create a Scratch project to share the areas they live in to the primary students in Hokkaido, as a preparation for the collaboration with the children in later part of the course. We told the students that the purpose of this group work was not just “to entertain the children with their works” but to “get the children curious and feel challenged to try creating projects themselves”. We hoped that in sharing their own communities the students would bring some personal meanings to the projects. However, in their initial ideas, most of their plans were to show famous tourist spots or theme parks. After we advised that meaning that only they can express has more valuable than what anyone can find on the internet, some students started to come up with more original ideas such as festivals in their own communities and dialects they speak in their areas. One student who is a Peruvian created a project to explain about a Peruvian community he lives in and its cultures. They showed their social urges in action: many projects included quizzes so that the children can interact with the projects rather than just watch them. (Figure 1) We shared all the projects with the primary students.

図1. 小学生に自分の地域を紹介した学生作品

6. On the 9th week, the students who saw videos of the children watching their projects (Figure 2) had comments indicating their social urges such as “It was worth working on the projects because the children enjoyed them”, “I was happy to see the children discussing and thinking hard to answer the quiz”, and “I look forward to receiving the children’s ideas”.

図2. 大学生の作品を見ている小学校のクラス

7. From the 10th to 14th week, they collaborated with the primary children. First the children sent us photos they took many different rooms and spaces in their school and some explanations about what they do there. The students discussed and asked the children many questions in order to create projects about these spaces. It took up to three weeks to send questions and get answers to all the questions, so they had only one week to finish their projects. In the very short time that they had, each group seemed to work very hard, meeting and discussing

their ideas and finished more complex projects than the previous ones. We shared these projects with the children in the primary school.

Supporting Group Collaboration by Older Students

Finally, we describe how we supported the collaboration in the groups. There were 4 or 5 older students, one graduate student and other undergraduates, who supported the online class as LAs (learning assistants). They mentioned their concern that the freshmen who could not see the university campus nor meet fellow students face to face would have hard time learning in online classes, and seemed strongly motivated to improve their experiences in the class. The author and the LAs met online once or twice a week 90 minutes each to discuss and design the class activities. During the first few weeks, it appeared to be very hard for the students to work with group members whom they had not met face to face: very few students turned their cameras on and in some groups there seemed to be very little conversation. Some groups gradually became actively communicating. The LAs (older student supporters) joined the group session and gave whatever supports they thought necessary to facilitate communication. They also organized an "After-Class-Session" every week in which the students were free to stay and ask questions, just to chit-chat or to see an online campus tour, where more and more students joined every week. We also organized meetings with individuals who expressed interests in which we tried to help them with their concerns. Some students talked about how they were trying to facilitate communication in their groups. In the group sessions, with the constant support from the LAs as well as some members trying to facilitate the group communication, more and more groups started to communicate with their cameras on. In the group photos to introduce themselves to the primary students, all of them had their cameras on and some groups even met face to face to take their photo. (Figure 3)

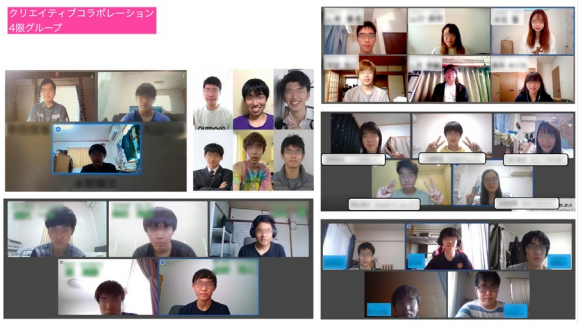


図3. 小学生に紹介する学生のグループ写真

DISCUSSION

We summarize some designs in the Creative Collaboration course described above that we introduced to bring personal meanings to learning, and try to understand how they affected the students' learning processes. The course has not finished at the time of writing this paper and the analyses we present below are only preliminary ones.

Design based on Learning Urges

We designed activities to activate the students' curiosity and challenge (learning urges). Rather than starting with the basic programming concepts or basic exercises, we let them challenge whatever

they became curious in the genres they were interested in. Then we tried to give advice to them on an LMS forum whenever they started to work on what they had passions for. The students whom we gave advices responded and could significantly improve their projects. We expected that their learning was highly correlated with their motivation to achieve the projects they had imagined. We also expected that the advices would activate learning urges in the other members of the same group with similar interests. We are in the process of analyzing their reflection data to confirm this prediction.

Design based on Social Urges

We designed activities to activate the students' social urges through their learning urges. As discussed in the previous section, we expected that the student groups based on their interests would facilitate their learning urges. We expected that their motivation to learn would facilitate communication and interaction within the group. Initially, in the online activity it appeared to be very difficult for them to interact with each other especially when most of them had their cameras and microphones off and did not have any information about each other except their names displayed on the screen. However, group by group they gradually started to communicate with group members. Some students started to try facilitating discussion in their groups. After some conversation started other members would follow and more and more students joined the conversation.

Another design based on Social Urges was the support from the LAs. Many students mentioned that LAs helped them in many ways, from asking them questions to giving advises. Yet another design based on Social Urges was the collaboration with the primary school children. In our earlier study, we found out that Scratch projects created by university students in collaboration with primary school children were about 5 to 10 times more complex than projects done by university students alone in otherwise identical setting (Miyata, Sugiura & Kamei, 2013). As mentioned above, the final projects the students created with the information from the children were more complex than the previous projects. Toward the end of the course most members appeared to be actively involved in the collaboration.

These observations suggest a possibility to shift from GDP to LDP in education if we can activate the students' Learning and Social Urges in a balanced way.

REFERENCES

Miyata, Y., Sugiura, M., & Kamei, M. (2013). World Museum – Expanding Passion through Cross-Cultural and Cross-Generational Collaboration, *the Journal of Japan Society for Educational Technology* Vol. 37 No.3

Dorn, S. (2011). Being Careless with educational history. https://shermandorn.com/wordpress/?p=3780 (accessed, July 2020)

Robinson, K. (2009). Education systems too narrow. https://www.abc.net.au/7.30/education-systems-too-narrow-sir-ken-robinson/2674682 (accessed, July 2020)

Golden Opportunity, Silver Lining or Dystopian Determinism: A Discussion of the Impact of the COVID-19 Pandemics Pivot to Online and the Opinions of Practicing Educators

Mark Curcher
mark.curcher@tuni.fi
Senior Lecturer
Tampere University of Applied Sciences
Tampere, Finland

The COVID-19 pandemic has closed schools, colleges and universities around the world and in many cases "pivoted" learning online through a range of technologies. This shift has been framed in various ways by both the educational media and others with an interest in education. The majority of this framing can be classified into three broad typologies: the golden opportunity to prove or disprove that online learning works; the silver lining that acknowledges most of the stress and challenge involved in the situation, yet still seeks to try to optimize the efficacies of online learning for the benefit of teachers and students; and finally, the dystopian frame centered around technological determinism of educational technology companies and their solutionist narrative.

To compare these framings to the practical, real life experience of educators, an online survey was conducted of a group of international teachers (n=23) working in a range of educational institutions around the world. This survey was used to gather data on both quantitative and qualitative aspects of their experience and see how well these matched the framing and metaphors being used in the educational media.

The findings reveal a diverse range of experiences that reflect various educational systems and cultures, yet a number of common themes do emerge and will be worthy of further research. These include issues of teacher training and preparation in the use of digital technologies, questions of equity and equality for students, concerns about care and privacy and shifts in teacher professional identity. Although aspects of the silver lining framing do seem to be appropriate in some cases, nuances in the milieu mean that it is not always appropriate, and that the metaphor of a portal can also offer a useful paradigm for reflecting upon the changes.

Key words: Online, Pandemic, COVID-19, Framing, Pivot

"I have called you before, mother, but you were always busy or isolated. I have something particular to say."
"What is it, dearest boy? Be quick. Why could you not send it by pneumatic post?"
"Because I prefer saying such a thing. I want —"
"Well?"
"I want you to come and see me."
Vashti watched his face in the blue plate.
"But I can see you!" she exclaimed. "What more do you want?"
"I want to see you not through the Machine," said Kuno. "I want to speak to you not through the wearisome Machine."
"Oh, hush!" said his mother, vaguely shocked. "You mustn't say anything against the Machine."
The Machine Stops. E.M. Forster. The Oxford and Cambridge Review.
(Originally published November 1909)

INTRODUCTION

Despite being written more than a century ago, E.M. Forster's short story from which the above quote is taken seems particularly relevant in 2020. Forster describes a world in which humans live separately, in individual small rooms, afraid to venture into the outside world but still connected together and able to communicate via the "Machine" (Forster 2009). Forster's fictional "wearisome Machine" of 1909 has, in 2020, become "Zoom fatigue".

Since the emergence of the COVID-19 in late 2019 / early 2020 a number of metaphors and similes have been used to frame the pandemic and its far-reaching impact on society, culture, the economy and politics. These are employed with a variety of intentions but are generally used in an effort to help us make sense of the changes that we are living through and so better understand the shifts that are taking place. They are attempts to inform our sense making process.

The purpose of this paper is to explore some of these metaphors and frames within the context of education and specifically the use of educational technology to facilitate what has become known as the "pivot to online and distance education". By then examining and reflecting upon the experiences of international educators during this period, the paper seeks to consider the appropriateness of these frames and metaphors as descriptions for what has taken place in practice as part of the daily milieu of enabling emergency online education in a pandemic.

THEORETCIAL CONTEXT AND FRAMING

Historians tell us that previous pandemics, such as the 1918 influenza pandemic and the bubonic plague (Black Death) of the 14th century had long lasting and far reaching impacts (Chotiner 2020; Snowden 2019). There is considerable evidence that the bubonic plague of the 1300's paved the way for the Renaissance and helped end the feudal system of servitude as economic forces shifted in the labour market, leading to improved equality (History.com Editors 2020; Wade 2020). There has been considerable speculation about the possibilities of change which may occur as a result of the 2020 pandemic.

There is no doubt that a real possibility for change exists. As Berardi (Berardi 2019:1) points out, these possibilities are plural, they are not however infinite, because they are "inscribed and limited in the present" (Berardi 2019:1). A full discussion of these potentialities is beyond the scope of this paper, but it is worth pointing out that there exists a field of possibilities to serve as a reminder that the future is not written and we have some agency as we navigate the "field of bifurcations" (Berardi 2019:1) and we, in part, have agency to shape our future.

As schools were closed to limit infection, many educational systems required their schools and colleges to transition to an online model of education. UNESCO estimate that almost 1.6 billion students were learning online at the peak of the school closures in the first two weeks of April 2020

(UNESCO 2020). The approaches to this shift to online vary considerably at all levels, with decisions being made at national, institutional and, in some cases, individual teacher level.

As early as March 10th an article in the Chronical of Higher Education entitled "Coronavirus and the Great Online-Learning Experiment" was framing the pandemic as an opportunity to find out if online learning can really work: "What were they learning? It's hard to tell" asked the author Jonathan Zimmerman (2020) of those who have been taking online courses. "But this year's biggest news story provides us with an opportunity to find out, if we're wise enough to seize it" (Zimmerman 2020).

This was an early indicator of a still emergent trend of educational media using the pandemic to amplify and support preexisting opinions about the efficacy of online learning and educational technology. Much of this pontification of opinion is ahistorical and ignores the existing body of literature regarding the use of educational technologies and online and distance education, whether through ignorance or willful blindness.

Broadly speaking, the framing of the pandemic in educational media can be characterized under three broad categories. The first framing is the golden opportunity where it can be proved that online learning does (or does not) work, depending upon pre-held opinions. The second framing, based upon the old adage that every cloud has silver lining, acknowledges that overall the pandemic is not a positive thing but also recognizes that there are some possible benefits (Mishra 2020; Zhao et al. n.d.) beyond just lining the pockets of technology vendors and increases in market share for their platform or app.

The third framing, that I have termed "dystopian determinism", is built around what has become known as the "Silicon Valley narrative" that education is broken and needs technology to repair it (Watters 2016; Weller 2015). In this frame the future is already written, and a particular version of technological progress is pre-determined and inevitable. Typical examples of this have been the writing and interviews of Scott Galloway whose attention-grabbing quotes shape a very particular narrative. "The pandemic will reshape the future of higher education — and many universities may not make it" (Galloway 2020). "The Coming Disruption: Scott Galloway predicts a handful of elite cyborg universities will soon monopolize higher education" (Walsh 2020). Even international bodies are not immune to this particular framing. For example, the World Economic Forum states "The COVID-19 pandemic has changed education forever" (Li and Lalani 2020) using the trope of disruption (Christensen, Horn, and Johnson 2008) to inform us that education has been "utterly disrupted" (Li and Lalani 2020) by the pandemic.

It is important to emphasize that this particular framing presents a narrative that calls into question both the purpose of education and the definition of learning. It often envisions an ending of public education and universities as they currently exist, because these are already seen as fundamentally inefficient as they do not (yet) wholly serve the machinery of the neoliberal economy. In this framing power is attributed to technology to shape education and learning (Grimaldi, Landri, and Taglietti 2020).

More positively and reflectively, despite the awful pandemic conditions in India, the Indian author Arundhati Roy (2020) has envisioned the pandemic from a different frame "It is a portal, a gateway between one world and the next" (Roy 2020).

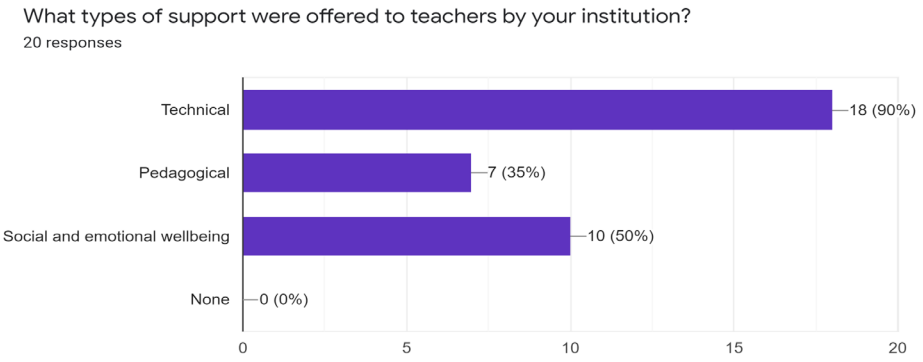
RESEARCH DESIGN AND METHODS

In order to examine the day to day experiences of practicing educators, it was decided to survey a cohort of MBA educational leadership students studying an online program while working in various contexts around the world. The data was collected using an online survey that gathered both quantitative data about technology adoption and open-ended qualitative data with regard to the opinions and emotional feelings of the teachers. In addition, some email correspondence and a small number of Zoom video conferences were used to supplement and clarify answers. Of 30 potential participants, 23 respondents completed the survey from a wide variety of international educational settings, a response rate of 77%. This paper seeks to draw and build on other research that examines the international experience beyond the "global north", such as the paper by Teräs, Teräs et al (2020) that includes reflections from Indonesia, Malaysia and Philippines, as well as Ireland and Finland.

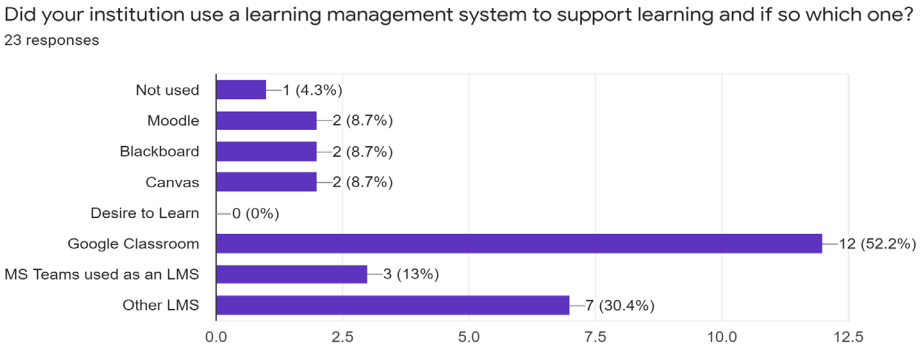
RESULTS

The survey respondents work in a range of educational settings across Europe, Asia, the Middle East and Latin America. The majority (52.2%) work in secondary schools (11 – 18 years), 5 work in higher education (21.7%), 3 in primary schools (7 – 11 years) and 2 in preschools/early years education (under 7 years). Most teachers (70%) moved to online provision during the three-week period from the 8th March to 23rd March 2020. Only 3 moved online before that window, in late February/ early March and 3 after that period. All were fully online by 22nd April. Just over a quarter (26.1%) of teachers had just one day's notice of the online pivot. The largest group (30.4%) had between 3 days and 1 weeks. Only 4 teachers (17.4%) had more than one week's notice.

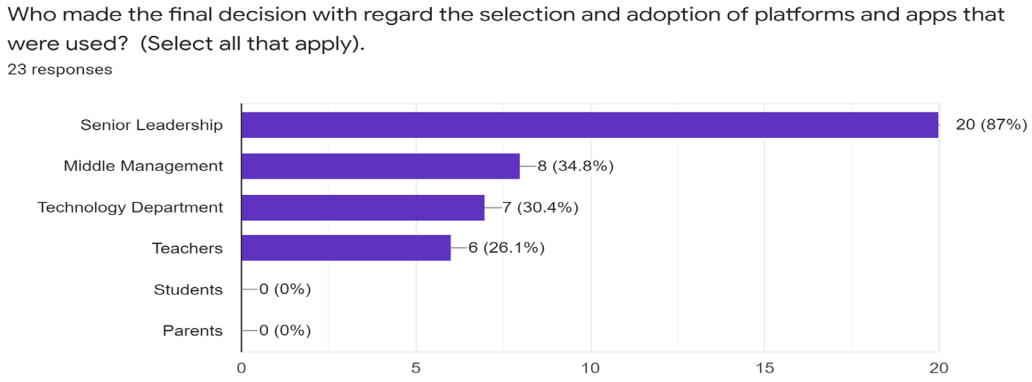
It is encouraging to note that 90% of respondents received technical support from their institutions however, only 35% received any pedagogical support. This focus on the technical is understandable but if longer term educational technology adoption is to take place, it is essential to commit more resources to the pedagogical aspects of online learning.



Google classroom was the most popular choice of learning management system, adopted by just over half of the respondents.



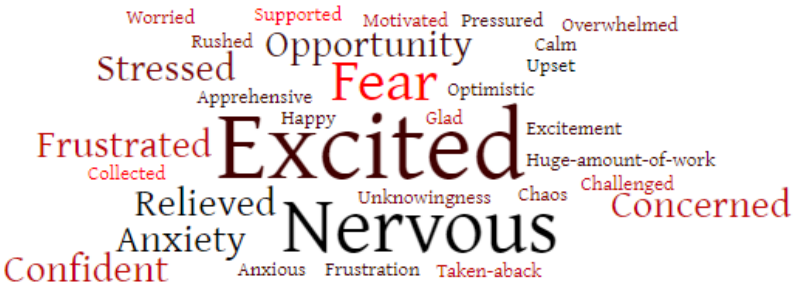
For the most part it was, unsurprisingly, the senior leadership team who made the final decisions regarding the selection and adoption of the platforms and apps used. It is interesting to note that students played no role in the decision-making processes and do not appear to have had any voice with regard to their preferences.



Open Ended Responses. The above questions do give us some data on the timing, platforms and types of support being offered but offer little in the way of insights about the actual lived experiences of the teachers during this period. The open-ended questions and subsequent emails and video conferences provided considerable amounts of insight and the scope for further papers beyond this conference paper.

These questions focused on the feelings and emotions of the teachers as they initially pivoted to online as well as reflecting back on the experience after some time online as either school vacations started or, in a small number of cases, they returned to face to face classes.

A full and deep discourse analysis of the responses has not yet been undertaken. Instead, in an attempt to capture the overall tone and emerging themes, it was decided to employ a more creative approach. The questionnaire asked respondents to recall and describe their feelings when it was announced that they would be moving to online learning. The answers to this have been scrutinized to identify the key emotional words used, then fed into a word-cloud generator. The larger the word, the more often it appeared in the responses.



This shows the very wide range of emotional experiences of the teachers and the full responses usually clarified the reasons for the emotion, for example feeling relieved or glad because of concerns about infection or frustrated at restrictions on the platforms that could be used. As can be seen, the most commonly expressed emotions were excitement, fear and nervousness. There was undoubtedly though a certain optimism resonating in the responses.

Initial analysis of responses regarding the challenges experienced, indicated that lack of time and professional development are key themes, along with concerns about the digital literacy of both teachers and students. Other themes include pedagogical skills and trying to maintain relations with students and colleagues through the medium of a screen and the social and emotional welfare of learners.

It is also clear that a number of teachers came to question their face to face practice and reflect upon their identity as educators. Several commented on the need to rethink learning activities and models of assessment.

DISCUSSION AND CONCLUSION

This paper has examined a number of ways in which the COVD-19 pandemic has been framed and portrayed in the media and papers and compared that to the practical experience of a sample of educators (n=23) located around the world. Within the context of educational technology, it seems that the pandemic and its affects were seized upon by both those who were pre-existing educational technology advocates and evangelists as well as those who remain resistant to online learning and the adoption of digital tools.

The reality was in fact more nuanced for educators and the students themselves, with a multiplicity of outcomes, experiences and emotions, that were variable over time. Indeed, the framing of online learning as a dichotomy is somewhat false and regrettable, because the reality does contain both beneficial and positive aspects as well as problematic challenges. In many cases the silver lining framing does therefore seem to be appropriate, though lacking in finesse. Indeed, as pointed out by Surma and Kirschner (2020) in their editorial for the journal Computers in Human Behavior, "Technology is in this respect both a risk and a chance for delivering distance education". This quote reflects in its phrasing the work of educational philosopher Gert Biesta, who argues that education itself should not be instrumental, but rather a "beautiful risk" (Biesta 2013).

There is no doubt from the survey that the situation did cause stress for teachers, educational leaders, students and parents and this sometimes led to rushed decisions and adoptions of platforms and models of online learning (Lossec et al. 2020).

The absence of student or parent voice in the decision-making process is worthy of comment and possible further research. As parents became more involved in the education process during lockdown, so many started to explore EdTech platforms and apps and their utility for supporting learning. Selwyn and Jandrić (2020) claim that there is now evidence of EdTech vendors shifting their focus directly to parents and students and bypassing schools and institutions altogether. The absence of student voice is probably due to the rush and panic that many schools faced, and it is known that many schools collected student feedback and opinions in order to help shape future decision making. Schools need to resist the opportunistic rush of vendors into the educational space and carefully reflect on issues of pedagogy and privacy (Teräs, Suoranta, et al. 2020).

It is clear that we are still at a very early stage in our analysis and understanding of the impact of the COVID-19 pandemic and the adoption of online learning for education and there remain many unanswered questions requiring further research. The data gathered will continue to be analyzed and further findings will be published in due course.

REFERENCES

Berardi, Franco. 2019. *Futurability the Age of Impotence and the Horizon of Possibility*.

Biesta, Gert. 2013. *The Beautiful Risk of Education*. Boulder: Paradigm Publishers.

Chotiner, Isaac. 2020. "How Pandemics Change History | The New Yorker." *New Yorker. Q. & A.* Retrieved July 21, 2020 (https://www.newyorker.com/news/q-and-a/how-pandemics-change-history).

Christensen, Clayton M., Michael B. Horn, and Curtis W. Johnson. 2008. *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns*. New York: McGraw-Hill.

Forster, E. M., ed. 2009. *The Machine Stops*. Las Vegas, NV: IAP.

Galloway, Scott. 2020. "Scott Galloway: Coronavirus Pandemic Is Reshaping Higher Education - Business Insider." *Business Insider*. Retrieved July 22, 2020 (https://www.businessinsider.com/scott-galloway-coronavirus-pandemic-reshaping-higher-

education-universities-may-close-2020-4?r=US&IR=T).

Grimaldi, Emiliano, Paolo Landri, and Danilo Taglietti. 2020. "For a Public Sociology of Digital Schooling (Emiliano Grimaldi, Paolo Landri and Danilo Taglietti)." *International Review of Sociology*. Retrieved July 22, 2020 (https://irs-blog.com/2020/07/06/for-a-public-sociology-of-digital-schooling-emiliano-grimaldi-paolo-landri-and-danilo-taglietti/).

History.com Editors. 2020. "Pandemics That Changed History: Timeline - HISTORY." *History*. Retrieved July 21, 2020 (https://www.history.com/topics/middle-ages/pandemics-timeline).

Li, Cathy, and Farah Lalani. 2020. "The Rise of Online Learning during the COVID-19 Pandemic | World Economic Forum." *World Economic Forum*. Retrieved July 22, 2020 (https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/).

Lossec, Nathalie, Nicholas Millar, Mark Curcher, and Marko Teräs. 2020. "The EdTech Trojan Horse; A Critical Narrative of the Emergency Pivot to Online Learning — Digital Culture & Education (ISSN: 1836-8301)." *Digital Culture and Education*.

Mishra, Punya. 2020. "Corona Virus: Silver Lining? For Learning? #silverliningforlearning – Punya Mishra's Web." Retrieved July 21, 2020 (https://www.punyamishra.com/2020/03/21/corona-virus-silver-lining-for-learning-silverliningforlearning/).

Selwyn, Neil, and Petar Jandrić. 2020. "Postdigital Living in the Age of Covid-19: Unsettling What We See as Possible." *Postdigital Science and Education*.

Snowden, Frank M. 2019. *Epidemics and Society: From the Black Death to the Present*. New Haven, CT: Yale University Press.

Surma, Tim, and Paul A. Kirschner. 2020. "Technology Enhanced Distance Learning Should Not Forget How Learning Happens." *Computers in Human Behavior* 110:106390.

Teräs, Marko, Juha Suoranta, Hanna Teräs, and Mark Curcher. 2020. "Post-Covid-19 Education and Education Technology 'Solutionism': A Seller's Market." *Postdigital Science and Education*.

Teräs, Marko, Hanna Teräs, Patricia Arinto, James Brunton, Daryono Daryono, and Thirumeni Subramaniam. 2020. "COVID-19 and the Push to Online Learning: Reflections from 5 Countries — Digital Culture & Education (ISSN: 1836-8301)." *Digital Culture and Education*.

UNESCO. 2020. "Education: From Disruption to Recovery." *UNESCO*. Retrieved July 20, 2020 (https://en.unesco.org/covid19/educationresponse).

Wade, Lizzie. 2020. "From Black Death to Fatal Flu, Past Pandemics Show Why People on the Margins Suffer Most | Science | AAAS." *SCIENCE*. Retrieved July 21, 2020 (https://www.sciencemag.org/news/2020/05/black-death-fatal-flu-past-pandemics-show-why-people-margins-suffer-most).

Walsh, James. 2020. "How Coronavirus Will Disrupt Future Colleges & Universities." *Intelligencer*. Retrieved July 22, 2020 (https://nymag.com/intelligencer/2020/05/scott-galloway-future-of-college.html).

Watters, Audrey. 2016. *The Curse of the Monsters of Education Technology*. ebook. Smashwords.

Weller, Martin. 2015. "MOOCs and The Silicon Valley Narrative." *Journal of Interactive Media in Education* 2015(1).

Zhao, Yong, Punya Mishra, Chris Dede, Curtis J. Bonk, and Scott McLeod. n.d. "Silver Lining for Learning | Conversations about the Future of Education." Retrieved July 21, 2020 (https://silverliningforlearning.org/).

Zimmerman, Jonathan. 2020. "Coronavirus and the Great Online-Learning Experiment." *Chronicle of Higher Education* 66(25):N.PAG-N.PAG.

Education Responses to COVID-19: A Comparison of Four Countries

Jan Maia Duggan
maia.duggan@gmail.com
Doctoral student
International Christian University
Tokyo, Japan

Jennifer Christine Clasara Fajardo
jenniclasarafajardo@gmail.com
Doctoral Candidate
International Christian University
Tokyo, Japan

Roberto Jr. Bacani Figueroa
rjbfigueroa@gmail.com
Doctoral Candidate
International Christian University
Tokyo, Japan

Eiman Yassin
eiman.barakat@gmail.com
Doctoral student
International Christian University
Tokyo, Japan

Insung Jung
isjung@icu.ac.jp
Professor
International Christian University
Tokyo, Japan

The now global COVID-19 pandemic has impacted and forever changed how we live our daily lives. This sudden change brought by the pandemic also applies to the field of education, where many countries had to approach this issue by conducting emergency remote teaching. In the case of K-12 education, many parents and educators around the world were concerned about the negative effects the pandemic can have on education and children. These education responses to the pandemic, however, seemed to differ by country. In order to understand how some of the non-western countries responded to the pandemic in terms of education, this present study investigated the education responses of four countries, the Philippines, Egypt, Korea and Japan, through document analysis. The findings were later compared to uncover similarities/differences, as well as investigate possible reasons for those similarities/differences among the four countries. Comparison of the education responses of these four countries revealed that the four countries were similar in how quickly they instructed school closures. Differences were seen between the four countries when comparing the findings to the Human Development Index (HDI) and Hofsteade's 6D model for each respective country. For example, the shift to emergency remote teaching was swift for Korea, as they have a high HDI (reflecting the wide-spread availability of ICT infrastructure) and high long-term orientation in Hofsteade's 6D model (showing that they are open to change).

Keywords: COVID-19 response, emergency remote teaching, K-12, online education, social distancing

INTRODUCTION

Background

COVID-19 has dramatically changed the overall landscape of almost all the countries in the world. In the field of education, one of the immediate responses to COVID-19 was to restrict access or close off institutions, especially those providing K-12, as these places are thought to have more avenues of infection due to mass gatherings in classes, lunch breaks, and club activities. These nationwide closures are impacting about 70% of the world's student population (UNESCO, 2020). However, researchers, practitioners, and not to mention, parents have alerted the negative effects the pandemic can have on education (e.g., Wang, Zhang, Zhao, Zhang, & Jiang, 2020; Burgess & Sievertsen, 2020). That is, in exchange for safety, children can possibly face consequences, such as lack of growth in social skills and social awareness (Burgess & Sievertsen, 2020). To combat the possible fatal impact the pandemic can pose on education, many countries have responded to this situation by implementing various strategies and school measures.

This study aims to explore how four countries, the Philippines, Egypt, South Korea (Korea hereafter) and Japan, are coping with and responding to COVID-19 crisis with regard to K-12 education. This study hopes to gain and provide further insight surrounding K-12 education during this COVID-19 crisis in non-western countries (i.e., countries in the East Asia and Africa region). Comparing the similarities and differences of these countries can possibly serve as valuable information for researchers, educators and policy makers.

Methodology

A document analysis, which focuses on investigating the education responses of four countries (i.e., the Philippines, Egypt, Korea, and Japan) during COVID-19, was conducted on recently published articles and documents from each respective country. The collected data were then sent to experts in the field who have in-depth knowledge of the current educational situation for confirmation. Once confirmed by experts, the data were then compared among the four countries to identify similarities and differences on how they reacted and the possibilities of why they reacted in that manner to the pandemic in K-12 education.

OVERVIEW OF THE CASES

Prior to investigating and comparing the education responses of the four countries, the basic profiles of each country and government responses of each country to the COVID-19 pandemic were researched to provide background information.

Country Profiles

The Philippines. The Philippines currently has a population of around 110 M (World Population Review, 2020), with over 27 M million K-12 students (about 2 M students in kindergartens, over 13 M in elementary schools, around 8 M in middle schools and nearly 3 M in high schools) for the 2019-2020 school year.

Egypt. Egypt has a growing population of 102M and expected to double in number by 2078 as it is increasing by 2M every year (World Population Review, 2020). K-12 school students are over 22M students which represents about 22% of the country's whole population.

Korea. Korea, with a population of 51.2M (World Population Review, 2020), has over 6M K-12 students (over 634,000 children in 8,837 kindergartens, over 2.7M students in 6,064 elementary schools, nearly 1.3M students in 3,214 middle schools and over 1.4M students in 2,356 high schools), over 3 M university students and 0.3 M distance adult learners. Korea is known as a global leader in information and communication technologies and has ranked high in e-learning readiness in education.

Japan. Japan, has a population of 126.5M (World Population Review, 2020), with over 14.9M K-12 students (over 1.2M children in 10,878 kindergartens, over 6.4M students in 20,095 elementary schools,

around 3.3M students in 10,325 middle schools, and nearly 3.3M students in 4,907 high schools) and over 2.8M university students as of 2017.

Government Reaction to COVID-19

The Philippines. The Philippines recorded its first case on January 30, 2020. The government's reaction to COVID-19 was not so different from other countries. Various news establishment websites provided timelines on key events during the pandemic. President Duterte's government presented key initiatives to combat the worsening pandemic. Upon news of the disease coming from Wuhan province, the government enforced travel bans beginning from China and eventually expanded to Hongkong and Macau. From March 15, an international travel ban was imposed for one month. At the moment, limited incoming international travel is allowed. An emergency community quarantine (ECQ) originally for a month was implemented in Luzon from March 15 and extended until April 30. It was further extended in high-risk areas like Metro Manila, Cebu, Central Luzon, and Bacolod. During this time, strict enforcement of policies was highly active. Cash aids, food assistance, and stimulus funds were also said to be given by the government but many affected families continue to complain that these funds have not been received yet. Currently, the Philippines has more than 70,000 confirmed cases, most of which are in Metro Manila. While the recovered cases seem to improve, the rate by which the infection continues to increase in the country is alarming the general public.

Egypt. With a total of 536 confirmed cases as of March 27, 2020 (Egypt Today, 2020b), and with the increasing number of cases, the government has quickly responded with robust strategic measurements to deal with this pandemic. First, to prevent the spread of the virus, schools and universities were closed, and international flights to and from the country were suspended. A nationwide curfew was imposed from 19:00 till 6:00 starting from March 25. All restaurants, cafes, and shopping centers except for drugstores and grocery markets were shut down entirely. Second, to support the country's economy during this outbreak, all the governmental entities tried to put effort into confronting the coronavirus's adverse economic impact. The Egyptian President, El-Sisi allocated 100 billion Egyptian pounds (approximately $6.35 billion) to finance a comprehensive plan for confronting the adverse effects of the emerging virus on the social and economic level (Egypt Today, 2020a). The Ministry of Health took several steps to counter the spread of the virus. However, the lack of some medical supplies to accommodate all cases is still an issue. Also, the central bank of Egypt took several measures, including reducing the interest rate by 3 percent in order to support the burden on indebted companies.

Korea. COVID-19 was confirmed in Korea on January 20, 2020 and was taken very seriously by the government. When there was the surging spread of COVID-19, the government raised an alert level to the highest on February 23. There was initial panic and concern from people, but Korea made a quick move to implement widespread and rapid testing in collaboration with business sectors for early detection of the virus (Bozkurt et al., 2020). It also introduced GPS tracking and traced the movement and interactions of infected individuals and sent tracking information to people using Kakao Talk (SNS) notification. And all COVID-19 related data were open to the public. Mandatory 2-week quarantine for those infected and traveled abroad were seriously applied, and new social norms such as wearing a mask, washing hands with sanitizers and social distancing were quickly acquired by the society. About 14 M families received the government's relief cash or shopping voucher of $820 and $39 billion emergency funding was pledged for small businesses and other stimulus measures. As of July 17, 2020, Korea has 13,672 confirmed cases and 293 deaths with 2.1% death rate (Coronavirus Resource Centers at Johns Hopkins University, 2020). With all these measures of the government and voluntary compliance of the people, Korea is considered as one of the countries which has gotten its coronavirus outbreak under control without enforcement of lockdown and border closure.

Japan. The first COVID-19 case was confirmed in Japan on January 16, 2020. During the first two months since the first confirmed case, the number of infected seemed to stay fairly low; However, due to the sudden surge in numbers in late March, Japan declared a state of emergency on April 7, 2020 for Tokyo and six other prefectures that faced the most cases. This was later extended to all 47 prefectures on April 16, 2020. This declaration of state of emergency was not a lockdown, as the current law and regulations in Japan do not allow for legal restrictions of human movement. People were instead requested

to avoid nonessential travel and stay at home as much as possible. Like many other countries, Japan implemented a mandatory 2-week quarantine to those that were infected and/or came back from their travels. Mask wearing, hand sanitization and following the 3C's (i.e., staying away from closed spaces, crowded spaces and close-contact settings) was recommended, and soon became the norm of the public. Japan provided relief cash of $930 per person to all citizens and applicable individuals, and various relief funds for businesses and working individuals impacted by the pandemic. Within a few weeks since the declaration of state of emergency, the number of infected dwindled to around under 50 cases per day. The World Health Organization (WHO) gave positive comments about Japan's efforts in keeping the number of infected to a minimum, despite not requiring a lockdown. Japan later lifted the declaration of state of emergency for all 47 prefectures on May 25. As of July 17 2020, there are 26,160 total confirmed cases, 988 deaths, with a 3.7% death rate (Coronavirus Resource Centers at Johns Hopkins University, 2020).

RESULTS

Education Responses

The Philippines. The abrupt shift to emergency remote education showed a socio-economic disparity between the advantaged and the disadvantaged students (Araz et.al, 2020). In a developing country like the Philippines, COVID-19 has inevitably exposed the vulnerability of the education system. The Philippines, as with most countries affected, continues to provide access to education regardless of the current challenges. Several research studies have provided a working list of initiatives, programs, and policies, the Department of Education (DepEd) in the country and the Commission on Higher Education (CHED) to adapt to the "new normal" in the educational setting. As of July 19, 2020, the UNESCO's COVID-19 Impact on Education page has shown the extent it has brought on all levels of education. At the national level, DepEd released DepEd Commons, an online learning platform for public school teachers to support distance learning modalities to continue the delivery of basic education (UNESCO, 2020). Apart from this, on June 19, 2020, the DepEd also released Order 12, Adoption of the Basic Education Learning Continuity Plan for the Year 2020-2021 in Light of the COVID-19 Public Health Emergency. This academic year, which will begin in August, basic, secondary, and tertiary education classes will all be done remotely. Last July 21, it was announced that restricted face-to-face sessions may be done in areas with low cases. Several responses are still currently being adopted in the country which has technological infrastructure problems too.

Egypt. On March 15, 2020, about 60,000 K-12 schools in Egypt were shut down to prevent the increase in COVID-19 infections (OECD, 2020). This was three months before the end of the academic school year 2019-2020. On the same day, the Ministry of Education and Technical Education in Egypt (MOETE) announced that no new learning content would be given to students. They will be having their end of school year exams on time from the syllabi taught to them until the school closure (World Bank, 2020b).

MOETE started to prepare an alternative learning plan for the students before receiving their end-of-year exams and applied distance learning strategies and assessment. The Ministry announced launching Egyptian Knowledge Bank EKB (https://study.ekb.eg). It is an online learning platform for asynchronous learning mode for all K-12 schools in Egypt (The World Bank, 2019). The World Bank (2020a) reported Egypt's quick response to accelerate its ICT services and provide open access to this platform. The Egyptian Knowledge Bank includes all the K-12 national syllabi in the form of digital content by grade and subject. Through this platform, students, teachers, and parents can access all the digital learning materials, including educational videos, textbooks, games, quizzes, and references (World Bank, 2020a). After two months from school closure, MOETE started to prepare for exams and assessments so students would be able to move to the next grade. Examinations from grade 3-9 were conducted in the form of an integrated research project assignment. The assignment details were announced through a new learning management system, Edmodo, under the supervision of the MOETE and the Ministry of Communication and IT (World Bank, 2020b). As for grade 10 and 11, computer-based online tests were conducted. For grade 12, the final school year before entering university, a standardized physical exam in all Egypt was held. This exam was essential to be conducted physically as students' scores decide which university theywill be entering. The country took all the necessary precautions for conducting these exams (World Bank, 2020a), about 680,000 students received the exam.

Prof. Tarek Shawki, the minister of education, announced that Egypt was one of the first countries to successfully end the school year 2019/2020 and the annual evaluation for 22 million K-12 school students.

Accordingly, Egypt managed to deal with this challenging situation. The minister mentioned that this might be an opportunity for changing the mindset of the Egyptian students and parents, introducing two new modes of education; technology in teaching and project-based learning. He added that this would be a turning point in the education system in Egypt.

Korea. Due to COVID-19, all schools were closed from early March to early April, 2020, for about one month and began to offer emergency online education from April 9. As the situation got better, the classes for high school seniors were first open on May 13 and the classes for all other grades were gradually open between May 20 and June 1. But then with a new increase in cases, most schools began to introduce a blended mode combining in-person classroom teaching with online classes at home. Each school district or each school decided details on the arrangement of distributed school attendance and the number of online vs in-person classes.

As reported in Bozkurt et al. (2020, p. 26), three types of emergency online education were introduced to elementary, middle and high schools: 1) synchronous interactive classes, 2) asynchronous content-based classes, and 3) independent assignment/activity-based classes. Teachers can combine two or three different types. EBS, a Korea's public educational broadcasting system (https://global.ebs.co.kr/global/introduction/vision), and Korea Education & Research Information Service (KERIS: https://www.keris.or.kr/eng/main.do#) are the two organizations which have offered both teachers and students with various modes of digital materials across all levels and all subject matters. For 2) asynchronous content-based classes, many schools use EBS Online Class (https://oc.ebssw.kr/ - in Korean only) which offers video lectures for all grade levels online. Some schools use KERIS e-Learning Support System (https://cls.edunet.net/ - in Korean only) which offers all subject matters between the 3rd to 10th grades, and other support and management services.

A survey (Gyeonggi Institute of Education, 2020) conducted with 286,550 students and 30,571 teachers in the elementary, middle and high schools in Gyeonggi Province between April 17 and 20, 2020 revealed that 86% of the students were able to focus on online courses, that 80.8 % perceived online learning was helpful in new learning, that 88.6% recognized great efforts and supports from their teachers and schools, and that 88.6% satisfied with interaction with teachers via online forum. The most popular type of emergency online education was asynchronous content-based courses using external resources (47.2%) or teacher-created audio or video lectures (40.5%), followed by synchronous interactive classes (7.1%) and 'independent assignment/activity-based classes (3.7%). Easy access to the external online course materials provided by EBS Online Class and/or KERIS e-Learning Support System seems to encourage teachers to provide more asynchronous content-based courses than other types of online education. Even though various forms of online materials across all subject areas were provided by EBS and KERIS and thus teachers did not have to make online content by themselves, Bozkurt et al. (2020, p. 27) suggest that schools in Korea must set up a system to provide initial teacher training for pedagogically effective and appealing online education and support services including manuals, workshops, peer supports, SNS groups, and more, and that teachers should consider student-student and student-teacher interactions to promote active learning.

Japan. Japan announced their closure of schools on February 27, 2020 and initially hoped to reopen by early April; However, with the continuous incline of infected cases and with the declaration of the state of emergency on April 7, the school closing extended until the end of May, with most schools reopened by June 1.

Japan initially struggled in implementing online education to K-12, as many of the schools/students lacked the equipment and resources needed to conduct/take online classes. There were cases where the schools who did have the necessary equipment were willing to lend their equipment (e.g., laptops, tablets) to students who did not have equipment, however, due to many families requesting them and the school not having enough equipment to go around to all families, they had to postpone lending of equipment and in some cases providing online learning in general, as it may involve an unfair, selective process resulting in inequality (Yamamoto, 2020). A survey administered by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) in mid-April reflected this situation, as it reported only 5 percent of local governing school districts across Japan (of the total 1213 that were surveyed) answering that they were implementing synchronous online classes, while 100 percent of the districts answered they will use paper-based materials during the nationwide school closures (MEXT,

2020a). The situation has since improved around mid-May, as many school districts' municipal board of education prepared and lent equipment needed to partake in online classes (e.g., Wi-Fi routers, tablets) to those families in need.

Many parents and educators were worried that this prevalent gap in the students' K-12 education from quarantine and technical-related reasons may cause lack of learning and loss of motivation, and possibly influence the competitive entrance examinations (Matsuoka, 2020). To try and combat these concerns, schools have been offering online or paper-based asynchronous self-learning, and/or synchronous online learning during the school closings as a temporary substitute for traditional face-to-face learning.

The nationwide school closures have unveiled the lack of ICT introduction in K-12 education in Japan. However, from the time schools were closed to this present day, Japan did continue to set guidelines to ensure children's learning during this pandemic (aimed for schools and educators) (e.g., Cabinet Office [CAO], 2020; MEXT, 2020b), and is now planning ahead of schedule in implementing and supporting the creation of ICT environments at schools and homes by the Spring of 2021 (MEXT, 2020b).

A Comparative Look

As shown in Figure 1, the spread of infections happened or were detected more quickly in Korea than the other three countries. This also affected how the Korean government made policies on many aspects of society such as education. The number of infections in all four countries were all below 20,000 from February to the middle of April. A flattening can be seen in both Japan and Korea starting May while an upward trend can be seen in the Philippines and Egypt. This could also explain the difference in education-related policies among the four countries.

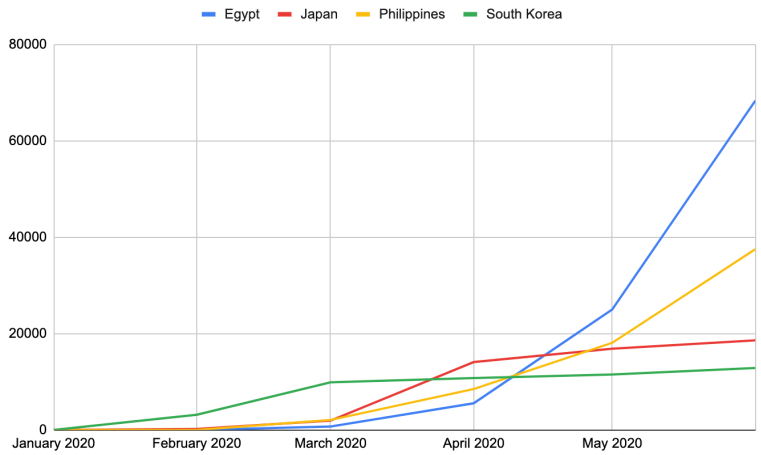


Figure 1. Trend of virus infections from January 2020 to June 2020 in Egypt, Japan, the Philippines, and Korea.

Similarities. All four countries had to close K-12 institutions starting late February and early March due to the upward trend of the number of infected individuals. Furthermore, during the closure, schools from all four countries explored emergency remote teaching online for students so that their educational opportunities will not be compromised. Many families in Egypt and the Philippines and some in Japan had problems accessing online materials shared by schools to their students. In this sense, the three countries were similar in the challenges that they faced.

Differences. The difference lies in how these explorations and plans were implemented. It was not mentioned that Korean families had problems accessing online lessons given by teachers to students. It is because Korea has an extremely advanced ICT infrastructure, which has been used in empowering online and blended learning in the country. Japan, though lacking in ICT infrastructure for education, had the financial resources to bring aid to families who needed equipment and connectivity to access these online materials. However, both the Philippines and Egypt have been struggling with making online materials accessible to all their students despite their projects. This can be explained by the disparity of the four countries' Human Development Index (HDI) as shown on Figure 2, which includes dimensions related

to income per capita and the gap between the rich and poor. While most Korean families could afford internet connection and computers to access online materials, Japan was able to augment the needs of some families through their local governments. However, the Philippines and Egypt were not able to address this lack due to the sheer number of needy families and the lack of resources available.

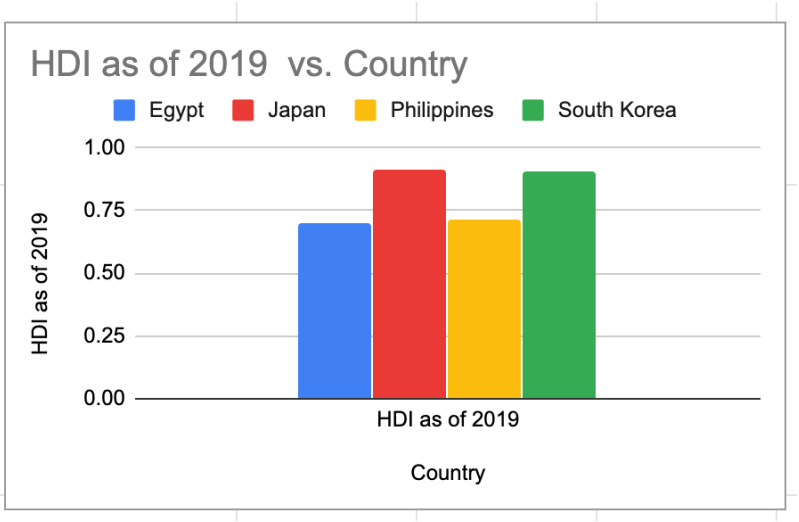


Figure 2. Difference among four countries' Human Development Index (HDI).

The differences can also be explained by the dimensions Hofestede's 6D model for the four countries as shown in Figure 3. Korea has the highest long-term orientation, which is combined with its relatively high uncertainty avoidance, as well as its low masculinity, individualism, and power distance. Their low power distance made their government accountable to the people who elected them as officials and worked on ways to improve ICT infrastructure for future generations. Revolutionizing education was easy because of their extremely high long-term orientation which meant that they were open to radical changes for the improvement of their country and society. Despite having similar traits, Japan fared less in terms of long-term orientation and had high uncertainty avoidance, which made them and the education sector a bit more resistant to change.

Meanwhile, the Philippines and Egypt both have high power distance, which meant that many people and families just accepted what those in power were doing. Though there were grumbling and resistance, they still ended up accepting what the government gave them. They also have extremely low long-term orientation, which made it difficult for their educational sector to incorporate changes in their educational system regarding ICT integration.

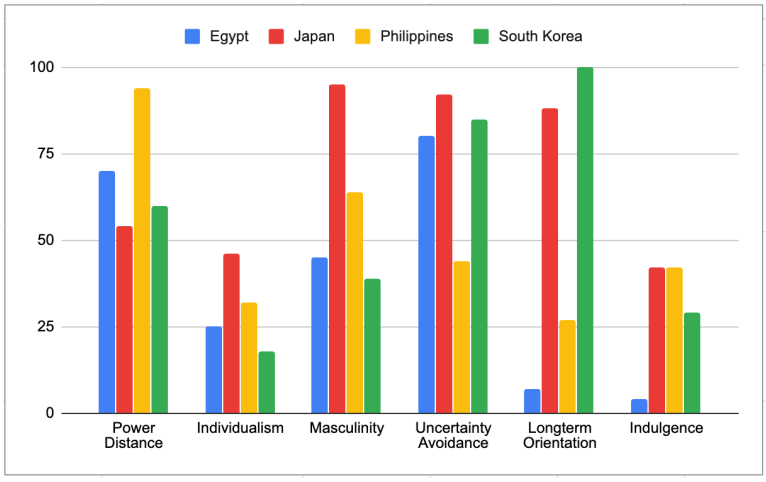


Figure 3. Hofestede's 6D model dimensions.

CONCLUSION

Three limitations for this study can be raised. First, there was the lack of empirical data due to time constraints. Second, the discussion of issues in modern society such as the digital divide and gap in socioeconomic status was not fully included. Third, other cultural factors apart from those mentioned in Hofsteade's 6D model were not fully considered. To overcome these limitations, future studies should: 1) gather data on the influence and impact of education responses of each country, 2) consider socio-economic factors in explaining the measures of emergency online education, and 3) consider other cultural factors that can possibly influence each country's education response.

Four cases in our study reveal the importance of :

- capacity building of teachers and learners for successful online education
- a system encouraging and supporting teachers' creation and sharing of digital materials
- the development of collaborative partnerships between schools and private sectors

Hopefully, the findings from this study shed light on future directions for policy makers and educators in deciding what should/should not and what could/could not be done to strengthen their online education environments.

REFERENCES

BOZKURT, A. et al. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education, 15*(1), 1-126. https://www.asianjde.org/ojs/index.php/AsianJDE/article/view/462

BURGESS, S., & SIEVERTSEN, H. H. (2020). Schools, skills, and learning: The impact of COVID-19 on education. *VoxEu. org*, *1*.

CABINET OFFICE (CAO). (2020). *Shingata coronavirus kansenshou kinkyuu keizai taisaku: Kokumin no inochi to seikatsu wo mamorinuki keizai saisei e [Novel coronavirus emergency economic measures: Protecting the lives and daily life of the people and revitalizing the economy]*. https://www5.cao.go.jp/keizai1/keizaitaisaku/2020/20200420_taisaku.pdf

CORONAVIRUS RESOURCE CENTERS AT JOHNS HOPKINS UNIVERSITY (2020). *Maps and trends*. https://coronavirus.jhu.edu/map.html

EGYPT TODAY. (2020a). *Egypt has strong strategy in dealing with COVID-19: Al-Mashat.* https://www.egypttoday.com/Article/3/85233/Egypt-has-strong-strategy-in-dealing-with-COVID-19-Al

EGYPT TODAY. (2020b). *Egypt's coronavirus figures still within range.* https://www.egypttoday.com/Article/2/83291/PM-Egypt%E2%80%99s-corona irus-figur es-still-within-range

GYEONGGI INSTITUTE OF EDUCATION (2020). *Corona19 and education: Focusing on online education*. Gyeonggi-do, Korea: Gyeonggi Institute of Education. https://www.gie.re.kr/publication/stdreportDetail.do

MATSUOKA, R. (2020, July 3). *Shingata Corona ga tsukitsuketa "kyouiku kakusa" (zenpen) [The "educational gap" pointed out by the novel coronavirus pandemic (part 1)]*. NHK. https://www3.nhk.or.jp/news/special/education/articles/article_19.html

THE MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE AND TECHNOLOGY (MEXT). (2020a). *Shingata coronavirus kansenshou taisaku no tame no gakkou no rinji kyuugyou ni kanren shita kouritsu gakkou ni okeru gakushuushidousha tou no torikumi jyoukyou ni tsuite [The current situation surrounding the approach to learning instruction in public schools: Relating to the temporary school closure measures to combat the novel coronavirus].* https://www.mext.go.jp/content/20200421-mxt_kouhou01-000006590_1.pdf

THE MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE AND TECHNOLOGY (MEXT). (2020b). *Comprehensive package for ensuring children's learning in the COVID-19 crisis.* https://www.mext.go.jp/en/content/20200714-mxt_kokusai-000005414_01.pdf

OECD. (2020). *The COVID-19 Crisis in Egypt: Tackling Coronavirus (COVID-19) Contributing to a global effort,* Paris, France.UNESCO. (2020). COVID-19 Educational Disruption and Response. https://en.unesco.org/covid19/educationresponse

WANG, G., ZHANG, Y., ZHAO, J., ZHANG, J., & JIANG, F. (2020). Mitigate the effects of home confinement on children during the COVID-19 outbreak. *The Lancet*, *395*(10228), 945-947.

THE WORLD BANK. (2019). *Shaking up Egypt's public education system.* https://blogs.worldbank.org/education/shaking-egypts-public-education-system

THE WORLD BANK. (2020a). *Lessons Learned from Egypt during the Pandemic: Implementing digital technologies to support remote learning and student assessment.* https://www.worldbank.org/en/events/2020/07/09/joint-oecd-harvard-hundred-world-bank-webinar-accelerating-modernization-of-education-in-egypt

THE WORLD BANK. (2020b). *How countries are using edtech (inducing online learning, radio, television, texting) to support access to remote learning during the COVID-19 pandemic*. https://www.worldbank.org/en/topic/edutech/brief/how-countries-are-using-edtech-to-support-remote-learning-during-the-covid-19-pandemic

WORLD POPULATION REVIEW. (2020). *Total population by country 2020.* https://worldpopulationreview.com/countries

YAMAMOTO, S. (2020, June 16). *Coronavirus crisis shows Japan lagging in online education.* NHK. https://www3.nhk.or.jp/nhkworld/en/news/backstories/1137/

COMBATING THE COVID-19 HATE AND RACISM SPEECH ON SOCIAL MEDIA

Reima Al-Jarf
reima.al.jarf@gmail.com
Professor
King Saud University
Riyadh, Saudi Arabia

The spread of Covid-19 worldwide has been associated with hate and racism speech on social media which sometimes encourages violence and bullying in the different communities. Some officials, public figures and even common people, including students, have been expressing hate, racism, negative, hostile, and intolerant attitudes towards certain groups of people based on their color, origin, race, religion or social/political stance. This study surveys students and instructors' views of Covid-19 five months after the outbreak of the pandemic, and whether they consider it a punishment from God to certain countries or not. Based on the findings, it proposes the creation of an anti-hate Twitter page to teach students tolerance rather than negative sentiment associated with Covid-19.

Keywords: Covid-19, coronavirus, social media, hate speech, racism, xenophobia, anti-hate, tolerance, negative sentiment.

INTRODUCTION

The spread of Covid-19 worldwide has been associated with xenophobia, hate and racist speech on social media which sometimes encourages bullying, microaggression and violence in the different communities. Since the outbreak of Covid-19, some officials, public figures and even common people have been expressing hate, racism, negative, hostile and intolerant attitudes towards certain groups of people based on their color, origin, race, religion or social/political stance. For example, in the USA, President Trump called Covid-19 *"the Chinese virus"*. Former Italian Deputy Prime Minister, wrongly linked Covid-19 to African asylum seekers, calling for border closures. In Indonesia, people called the first women infected with Covid-19 *"devil"*. A man in the UK spat on a black woman, told her he had corona, then intentionally killed her. In Lebanon, people avoided talking to and coming close to a Chinese student and called him *"Corona"*. A party leader asked the Lebanese government to quarantine and lockdown Palestinian refugee camps in Lebanon. In Saudi Arabia, an actress suggested that Covid-19 vaccines be

tried on prisoners. Due to the crisis in Kuwaiti hospitals, a Kuwaiti actress called for throwing foreign laborers infected with corona in the desert. Bahrain refused the return of its Shiite citizens from Iran[1].

Moreover, in February and March 2020, many Arabs on Twitter considered the outbreak of Covid-19 in China a punishment from God for what it did to the Uighur Muslims[2], and when Covid-19 spread in Iran, they considered it a punishment because they are Magus and Rejectionists, and for political reasons. Such negative sentiments, racist comments and declarations were even assimilated by the young generation who started to openly declare similar negative, hostile and intolerant attitudes towards some countries, religious sects and races.

Since the outbreak of Covid-19 in China, the impact of the pandemic on public health, the economy, tourism, education, sports, commerce, international relations and politics has been the subject of numerous studies. A review of the literature has shown some studies that investigated the spread of hate and racism speech due to the Covid-19 pandemic. For example, Haokip (2020) looked into racial discrimination of Northeast Indians during the outbreak of Covid-19 in India. Tran (2020) examined how news articles frame the rise of anti-Asian racism and sentiment during the Covid-19 pandemic. Another study by Pei & Mehta (2020) proposed a three-stage-based approach that shows how negative sentiments changed over the Covid-19 stages of development: Changing from a domestic epidemic, into an international public health emergency, then into a global pandemic. They percentages of negative sentiment over the three stages were 50%, 50%, and 52% respectively.

A second line of research focused on the spread of hate speech associated with the Covid-19 pandemic on Twitter. Schild, Ling, Blackburn, Stringhini, Zhang and Zannettou (2020) found that Covid-19 aggravated Sinophobia on the Internet, and that Sinophobic content exists on fringe Web communities like /pol/ which is a political discussion board on the image-based bulletin board 4chan, and to a lesser degree on Twitter. They noted a shift towards blaming China for the Covid-19 pandemic on Twitter, and a shift towards using more Sinophobic slurs on /pol/. In addition, Ziems, He, Soni & Kumar (2020) analyzed Asian hate and counter-hate tweets in the COVID-HATE database. Their analysis revealed that bots constituted 10.4% of hateful users, and were more vocal and hateful; whereas hateful bots were more successful in attracting followers compared to counter-hate bots. Hateful and counter-hate users interacted and engaged extensively with one another. The researchers concluded that counter-hate messages can discourage users from becoming hateful. Moreover, Vidgen, Botelho, Broniatowski, Guest, Hall, Margetts, Tromble, Waseem, and Hale (2020) created a classifier that detects and categorizes tweets into four categories: (i) Hostility against East Asia, (ii) Criticism of East Asia, (iii) Meta-discussions of East Asian prejudice, and (iv) a neutral category. The classifier can help researchers in moderating online content and investigating the dynamics, prevalence and impact of East Asian online prejudice during the pandemic.

The literature review showed lack of studies that investigated negative sentiments associated with Covid-19 among Arab students and instructors, and lack of studies about the availability of Twitter pages that target students and educate them with regards to hate and racism issues related to Covid-19, and that

[1] https://www.facebook.com/watch/?v=517624355807220
[2] https://www.facebook.com/100010966335643/posts/1096572814051586/

alleviate xenophobic narratives and racist attacks by the students. Therefore, the present study aims to: (i) find out whether there are still negative sentiments against certain countries, communities and races associated with Covid-19 five months after the outbreak of the pandemic, by surveying a sample of Arab students and instructors to find out whether they view Covid-19 as a punishment from God to some countries or not, and what reasons they give to justify their point of view; (ii) to search Twitter for pages that combat hate and racism speech associated with Covid-19 in students and instructors; and (iii) to propose a model for a Twitter page that targets students, and teaches tolerance, understanding, open-mindedness and anti-racism associated with Covid-19.

Due to the harmful effects of hate speech and negative sentiments on individuals, the society, global community and international relations, results of the study will shed light on Arab students and instructors' attitudes towards other communities due to the outbreak Covid-19. It will raise the public, students, instructors, and administrators' awareness of negative sentiments towards other countries, and misconceptions about the causes of the Covid-19 pandemic. Students and educators will benefit from the proposed Covid-19 anti-hate and anti-racist Twitter page, which aims to broaden students' horizons, provide them with multiple views of, and authentic information about the pandemic, to educate students as to the real causes of the Covid-19 and how to reduce its spread; to alleviate hatred and racism; to hold dialogues among culturally diverse students; to re-shape students' perceptions of other races, faiths and religious sects; and to teach the importance of getting together and cooperating to face the pandemic.

METHODOLOGY

Participants

The participants consisted of 230 Arab students and instructors (125 students and 105 instructors) who were randomly selected from a population of 15,000 contacts and followers of the author on WhatsApp, Imo, Telegram, Twitter, Facebook and LinkedIn. The participants come from different Arab countries, belong to different age groups, and have different academic levels and areas of specialty.

Sample of Twitter Pages

The author searched Twitter for pages that counteract hate and racism associated with Covid-19 such as pages that teach tolerance and understanding to students. The author used the following search terms and phrases: Teaching tolerance, cultural diversity, combating coronavirus hate speech, Covid-19 and racial injustice, coronavirus anti-hate speech and others.

Questionnaire-Survey

The subjects answered a questionnaire-survey which consisted of an open-ended question that requested them to state their opinion as to whether they consider the Covid-19 pandemic a punishment from God, and to select the country/countries that they believe is/are being punished by the pandemic (China,

USA, France, Germany, Italy, Spain, Brazil, Iran, Turkey, India, Malaysia, Philippines, Arab countries). They were also asked to justify their point of view by giving reasons for considering it a punishment or not.

Content Analysis

The author skimmed through the Twitter accounts, especially the tweets that were published between March and July 2020 to have a feel for the issues tweeted, the followers' interaction features, kinds of information tweeted, and how hate and racism speech, prejudice associated with Covid-19 are handled.

Statistical Analysis

The author analysed the responses to the questionnaire-survey and calculated the following: (i) The percentage of participants who believe that Covid-19 is a punishment from God; (ii) percentage of participants who do not believe it is a punishment; (iii) percentage of participants who were undecided; (iv) percentage of participants who mentioned each country as being punished by Covid-19; (v) the correlation between the responses of instructors and students. Results of the content analysis of the tweets are reported qualitatively.

RESULTS

Results of the Questionnaire Survey

Data analysis showed that 51% of the participants viewed Covid-19 as a punishment from God, 33.3% do not consider it a punishment, and 15.7% were undecided (did not know). A positive correlation was found between instructors and students' responses (r =.41) which means that students and instructors have similar positive or negative sentiments (points of view) and that students are affected by adults' points of view. These findings are consistent with findings of a study by Pei & Mehta (2020) which found that the percentages of negative sentiment were 50%, 50%, and 52% across the 3 stages of development of Covid-19.

As to the countries that the subjects think are being punished by Covid-19, results showed the following: China (40.6%), USA (30.5%), all countries (27%), Arab countries (27%), Iran (17%), and India (13.6%). The subjects think that Covid-19 is a punishment to China because of their crimes against Uighur Muslims; to the USA for their invasion of and crimes in many countries; to Arab countries because they are not following the teachings of Islam; and to the whole world because of corruption and vice.

Findings of the present study show some prescribed morals. For instance, some participants interpreted the punishment from an ideological point of view such as *Iran is the enemy of God, enemy of Islam and Arabs.* There are also some social myths as in: *The Chinese eat insects and bats.*

Results also revealed lack of exposure to other cultures, inadequate knowledge, misinformation, and believing and interpreting information without verification as in the following comments: *"China tortures Mianmar's Muslims"; "Russia promotes homosexuality"* and "*Iran mistreats Muslims".* A student said: *I never travelled but this is what I hear*. Some made overgeneralizations such as: *The USA, India,*

Russia, Germany, France, Italy, Britain, Spain are the axis of evil. 27% said it is a punishment to all Arab countries and the whole world, on equal footing and without excluding any country.

On the other hand, participants who think Covid-19 is not a punishment said: "*God is just and will not punish all the people in the world"; "people of all religions and faiths have been affected"; "Covid-19 is like other catastrophes (floods, draughts and earthquakes) that hit everybody and any country"*. Some gave medical, social, economic, political, travel and commercial causes of the pandemic. Others gave examples of pandemics that took place throughout history such as the Plague and Spanish Flu.

The emergence and spread of hate speech and negative sentiment during the Covid-19 pandemic can be interpreted in the light of the social amplification and attenuation risk framework by Kasperson & Kasperson (1996) which states that the secondary consequences of a risk event (hate speech) serve as amplifiers of the original risk (Covid-19) and activate representations of similar events (negative sentiments) within the receivers (students and instructors). Newspapers, television, and social media are powerful communication tools that enable their users to send (hate and racist) messages and convey information about Covid-19 to millions of people simultaneously. Acting on the assumption that recipients (students and instructors) of a media message process, not only its explicit verbal content, but also the implicit message conveyed through its pictures and figures of speech, such as the pictures of medical staff wearing face masks and shields, gloves and protective gowns, images of patients on respirators, images of dying people and massive graves, dramatic spread of the coronavirus, and the hike in new daily cases worldwide. Adding such pictures of a catastrophic event (Covid-19 pandemic) as a mere means of illustration, can convey information that appeals to the recipients' affect, emotions, cognition and behavior which are interrelated and influence one another. Values, attitudes, social influences, and cultural identity determine what students perceive as a threat to their well-being, and how they evaluate probabilities and magnitudes of unwanted consequences.

Availability of Anti-hate Twitter Pages for Students

The author found a limited number of pages on Twitter that promote tolerance, anti-hate and anti-racism. Those pages are:

[1] *Teaching Tolerance* (https://twitter.com/Tolerance_org): It has 93K followers and 14.6K tweets. It is dedicated to creating equitable school experiences for students and supporting educators. Tweets are not specifically focused on tolerance and Covid-19.

[2] *Students Against COVID19* (https://twitter.com/StudentsCOVID19): It has 218 Followers and 123 Tweets. It is an Initiative led by students @HarvardChanSPH to engage students everywhere to tackle Covid-19 by supporting communities and spreading factual information about Covid-19.

[3] *Essex Cultural Diversity Project* (https://twitter.com/essex_cdp): It has 925 Followers and 2,115 Tweets. Through arts, cultural and heritage projects members raise awareness of race equality and cultural diversity, benefiting all people within communities across Essex, England only.

[4] *EMISCO* (https://twitter.com/Eu_Emisco) has 772 followers, and 2,064 tweets. It aims to combat all forms and manifestations of discrimination, hate speech and hate crimes including Islamophobia in

Europe. It offers some webinars on the issue of Covid-19. What needs to be done? How can people strengthen the monitoring of racism and discrimination that COVID19 has exposed?

The above Twitter pages focus on anti-hate and anti-racism in general, not necessarily those associated with Covid-19. They do not target students in particular. They are for all people and all age groups. Lack of Twitter pages that counteract hate speech and negative sentiments associated with Covid-19 may be due to lack of new research into this new area of social science. This reflects the need for creating such a Covid-19 anti-hate page on Twitter. This anti-hate page is described below.

PROPOSED ANTI- HATE TWITTER PAGE MODEL FOR STUDENTS

This study recommends the creation of a special Twitter page for counteracting hate and racist speech associated with Covid-19 among students and instructors. The page aims to: (i) teach tolerance to students, (ii) raise students' awareness of the Covid-19 pandemic, (iii) develop critical awareness and critical thinking skills, (iv) develop dialogue skills, (v) develop global awareness related to the Covid-19 pandemic, and (vi) develop students' ability to search for valid and authentic information. Teachers and students from different backgrounds, countries, cultures, ethnicities, religious backgrounds should be asked to follow the page and actively participate in the dialogs and activities. Based on the strategies mentioned by Arneback (2014), Coates (2020), Rahardi (2020), Gee, Ro, and Rimoin (2020); Ziems, He, Soni and Kumar (2020), Chung, Kuzmenko, Tekiroglu and Guerini (2020), Jääskeläinen (2020) and Paulo Freire's[3] pedagogical approach, the page should focus on the following:

[1] Students and instructors from different backgrounds enter into *dialogue* with each other to gain knowledge of the reality of Covid-19, and to critically reflect on the pandemic. The Twitter learning environment should be characterized by mutual trust, respect, care and members' support of one another.

[2] Since social myths have a dominant tendency, developing critical awareness of the Covid-19 reality through reflection and action, and raising students' critical awareness will help interpret violent incidents related to Covid-19 in students' daily life, and help them understand Covid-19 -related news.

[3] Encouraging students to gather information to build up a picture around Covid-19's real situation, people infected with it, causes of the pandemic, prevention and treatment, and effects of the pandemic on people's daily life. The students can get up-to-date information on Covid-19 from multiple resources such as: University College Cork's response to Covid-19 (https://ucc.ie/en/emt/ covid19/), *Council of Europe*'s *Covid-19*: *Human rights are more important than ever in times of crisis* (https://www.coe.int/ en/web/portal/ Covid-19), World Health Organization and others.

[4] Monitoring bias on social media platforms and verifying information by examining the source and checking facts by the students.

[3] https://www.freire.org/paulo-freire/concepts-used-by-paulo-freire

[5] Using science-based education to help students understand the formulation of race and its intersection with science, to help them avoid connecting diseases with faiths and social groups by avoiding certain visual images, and disassociating verbal and nonverbal connections.

[6] Opposing hate content with counter-narratives and sending out consistent informed counter-hate textual messages to help promote facts, encourage salutegenic behaviors, calm down fears and discourage students from turning hateful. An-expert-based dataset of hate speech and counter-narrative pairs can be created. Students can respond and react to, and discuss those. Students may use art and culture for creating counter narratives to counterbalance one-sided narratives and simplified overgeneralizations by hate speakers.

[7] Raising students' global awareness by bringing the outside world to the students' realm through publishing and watching videos about Covid-19 around the world such as: UNICEF kids' video diaries about life during Covid-19, and CNN's Global Views videos. Student followers can comment on an discuss the video content.

[8] Raising awareness of the Islamic view of pandemics by publishing views of senior Muslim Scholars such as Al-Azhar Shaikhs, Mufti of Egypt/Lebanon and senior Ulama's in Saudi Arabia which show that pandemics are not a punishment from God to all humanity.

[9] Raising students' awareness of the Islamic view of the other to teach acceptance and tolerance. The Quran says ***"****O mankind, indeed We have created you from male and female, and made you peoples and tribes, so that you get to know one another. Indeed, the most noble of you, in the sight of Allah, is the most pious"*. The Quran also says: *"There is no compulsion in religion. The right path and the wrong path are clear"*.[4]

[10] Students can search for and tweet examples of pandemics that took place throughout history such as the Spanish flu, the plague in the Middle ages and others.

CONCLUSION

This study is the first of its kind in socio-linguistic research in the Arab World as it surveyed a sample of Arab students and instructors to find out whether they think the Covid-19 pandemic is a punishment from God to some countries such as China, USA, Iran, Russia, some European countries and/or Arab countries or not, and to find out whether there are Twitter pages that target students and instructors and teach them tolerance, critical thinking, dialog, and raise their awareness of other cultures, communities, history of pandemics and the causes and current situation of the Covid-19 pandemic. In addition to the creation of anti-hate and anti-racism Twitter page(s) that aim to educate the young generation regarding the Covid-19 pandemic, Arab Ministries of Information should pass laws for monitoring and eliminating hate and racism speech; promoting tolerance, equity and human rights on social media; and banning violators

[4] http://quran.ksu.edu.sa/translations/english/1.html

from using social media. However, further studies that investigate the impact of Covid-19 on other social and psychological issues in Arab countries are needed.

REFERENCES

Arneback, E. (2014). Moral imagination in education: A Deweyan proposal for teachers responding to hate speech. *Journal of Moral Education*, *43*(3),269-281.

Chung, Y., Kuzmenko, E., Tekiroglu, S., & Guerini, M. (2019). CONAN - *COunter NArratives through Nichesourcing: A Multilingual dataset of responses to fight online hate speech.* Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics, pp. 2819–2829. Florence, Italy, July 28 - August 2.

Coates, M. (2020). Covid-19 and the rise of racism. *BMJ, 369*. Retrieved on July 15, 2020 from doi: https://doi.org/ 10.1136/bmj.m1384.

Gee, G., Rimoin, A. & Ro, M. (2020). *Seven reasons to care about racism and* Covid-*19 and seven things to do to stop it.* The UCLA Fielding School of Public Health. Retrieved on July 15, 2020 from https://ph.ucla. edu/ucla-fielding-school-public-health

Haokip, T. (2020). From 'Chinky' to 'Coronavirus': Racism against Northeast Indians during the Covid-19 pandemic. *Asian Ethnicity, May, 1-21*. Retrieved on July 15, 2020 from https://www.tandfonline.com/doi/pdf/10.1080/14631369.2020. 1763161? needAccess=true

Jääskeläinen, T. (2020). Countering hate speech through arts and arts education: Addressing intersections and policy implications. *Policy Futures in Education*, *18*(3), 344-357.

Kasperson, R. & Kasperson, J. (1996). The social amplification and attenuation of risk. *The ANNALS of the American Academy of Political and Social Science, 545*(1), 95-105.

Pei, Xin & Mehta, Deval (2020). #Coronavirus or #Chinesevirus?!: Understanding the negative sentiment reflected in Tweets with racist hashtags across the development of Covid-19. *arXiv:2005.08224*.

Rahardi, R. (2020). Building critical awareness of corona virus-related news: Cyber-pragmatic study of Covid-19 hoaxes on social media. *international Journal of Advanced Science and Technology, 29*(6), 5398-5409.

Schild, L., Ling, C., Blackburn, J., Stringhini, G., Zhang, Y., & Zannettou, S. (2020). "*Go eat a bat, Chang!": An early look on the emergence of Sinophobic behavior on web communities in the face of Covid-19.* Retrieved on July 15, 2020 from https://idrama. science/papers/sinophobia-2020-04-08.pdf

Tran, E. (2020). *A content analysis of anti-Asian racism and sentiment amid the Covid-19 pandemic in digital media.* McEwan University. Retrieved on July 15, 2020 from roam.macewan.ca.

Vidgen, B., Botelho, A., Broniatowski, D., Guest, E., Hall, M., Margetts, H., Tromble, R., Waseem, Z., & Hale, S. (2020). *Detecting East Asian prejudice on social media.* Retrieved on July 15, 2020 from https://arxiv.org/pdf/2005.03909.pdf

Ziems, C., He, B., Soni, S. & Kumar, S. (2020). Racism is a virus: Anti-Asian hate and counter-hate in social media during the Covid-19 crisis. *arXiv.org 12423, 1.*

Systematic Review of Digital Note-taking in Higher Education

Yinghui Shi
yhshi@mail.ccnu.edu.cn
Assistant Professor
Central China Normal University
Wuhan, China

Qiuyu Pu
qypu@mails.ccnu.edu.cn
Master student
Central China Normal University
Wuhan, China

With the development of information technology, there is an increasing number of students use digital devices to take notes in the classrooms. Early studies have shown that note-taking is a highly effective way of learning, which helps students to concentrate, think, recall, and improve their academic performance. In recent years, a number of studies have explored the effects of digital note-taking on student learning outcomes. However, no systematic review has been conducted to summarize the overall effects of digital note-taking in existing studies. To this end, this study synthesizes the research literature on digital note- taking to figure out the effects of digital note-taking on student learning outcomes in higher education.

Keywords: digital note-taking, systematic review, learning outcomes, higher education

INTRODUCTION

Note-taking is an important part of classroom activities, which helps to improve students' overall recall level (DiVesta & Gray, 1972), enhance students' attention, and make students more carefully understand and reconsider information, allow students organize knowledge structure greater, so as to improve students' learning ability as a whole. Studies have confirmed that note-taking provide a great positive benefit to students' examination results (Van Meter, Yokoi, & Pressley, 1994). In recent years, with the continuous development of information technology, the widespread use of digital devices, such as personal computers (PCs), laptops, tablet PCs, mobile phone, has gradually replaced the role of traditional paper and pen in taking notes in the classroom (Fried, 2008; Stacy & Cain, 2015). Compared with traditional paper notes, digital notes is more malleable and can be easily searched, edited and read, and easier to share, organize, translate, and other operations to support reflection, recall, synthesis, and collaboration (Grahame, 2016). Consequently, digital note-taking is often used for knowledge management and supporting collaborative learning. However, some studies have pointed out that students' use of laptops in class may lead to learning distraction (Patterson & Patterson, 2017), which is not conducive to students' learning development. As a result, some teachers and students are skeptical and resistant to the use of digital notes in class.

Despite the long history of note-taking, research focusing on digital note-taking in classrooms is a recent years' research phenomenon. To the best of our knowledge, no systematic literature review has

been conducted on the topic of digital note-taking. However, thorough reviews of previous literature provide an effective means for establishing the foundations of knowledge, describing the key concepts, facilitating theory development, and identifying paths for future research that is needed to strengthen the research field (Webster & Watson, 2002).

The main purpose and contribution of this literature review were to (1) outline past studies to synthesize results describing the learning outcomes of using digital note-taking; and (2) showcase academics that have called for studies on this topic to highlight research gaps that emerge from the synthesized literature. This study presents a synthesis of research scattered to expedite future research on this important issue in higher education.

RESEARCH DESIGN & METHODS

The search procedures for identifying relevant literature were based upon Webster and Watson's three-step recommendation for conducting a systematic review. The three-step process consisted of (1) identifying the major contributions that exist in prominent journals, (2) tracing research chronologically backward in time to identify other related articles that should be considered by reviewing the citations of the previously identified prominent journal articles, and (3) expanding the review forward in time by using the key phrases commonly identified among the previous research to search among a variety of databases to extend the breadth of publication coverage. This procedure was recommended to support a complete review that is not arbitrarily constrained to specific research mythology, type of journals, or geographic area (Webster & Watson, 2002).

First, identify the main contributions. The major contributions are likely to be in the leading journals (Webster & Watson 2002). Therefore, after researching the topic, six major contributions were identified among prominent research journals, including Computer & Education (Alvarez, Salavati, Nussbaum, & Milrad, 2013), Instructional Science (Luo, Kiewra, Flanigan, & Peteranetz, 2018), Contemporary Educational Psychology (Yang, Jody, Bryan, Baker, Luc, & Jaclyn, 2018), The Journal of Economic Education (Artz, Johnson, Robson, & Taengnoi, 2020), Psychological Science (Mueller & Oppenheimer, 2014), Journal of Educational Psychology (Bui, Myerson, & Hale, 2013). Secondly, check the reference list of the major contributions mentioned earlier in chronological order. Based upon a careful exploration of the six reference lists, 23 related articles were identified and preliminarily archived for this literature review. Then read the literature, and use Google Scholar to identify the articles with high citation frequency, and further check the reference list of the related articles that are well written or highly cited, so as to expand the depth of the archive being developed on this topic. Finally, according to the knowledge obtained in the first and second steps, several common terms are determined to describe this phenomenon. The specific search phrases used in this study were developed and used based on these common terms, including "electronic note(s)", "digital note(s)", and "digital note-taking".

The EBSCO, Education Resources Information Center (ERIC), ProQuest, Springer Link, Taylor & Francis Online, Elsevier science direct online, and Web of Science were selected as the data sources, because they provide a wide multidisciplinary lens and a baseline intellectual rigor for identified publications. When utilized together, it was believed that these databases would uncover publications from a wide variety of citation indexes, content sources, countries of origin, and differing perspectives. When utilizing the search phrase, two constraints were added to identify only 'peer-reviewed' and 'English' manuscripts. The initial electronic searches on the databases yielded 308 articles. Upon combining the results, 279 articles were identified after 29 duplicates were removed. According to the title and abstract of the paper, 108 relevant articles were identified after 171 unrelated articles were removed. The relevant search results were then individually examined based on the following criteria:

- Research must be an empirical study on digital note-taking.
- Research must include the learning result data of any of the three aspects of students' cognitive/affective/behavioral learning outcomes.
- Research participants must be enrolled in formal higher education institutions.

Among the 108 relevant studies identified, 20 studies met the above-mentioned selection criteria. Previous research has utilized activity theory as a framework for documenting the data of literature reviews (Keengwe & Kang, 2013). Therefore, based upon activity theory and the conceptual and theoretical framework of the present dissertation, the 20 selective studies were examined based upon their respective (1) subjects, (1) objects, (3) mediating artifacts, (4) rules, (5) community, and (6) division of labor.

RESULTS AND DISCUSSIONS

Theory Activity theory was selected to be the basis of evaluating the research. Activity theory provides a classification system to describe the different aspects of human activity. Activity theory suggests that human activity systems consist of six main aspects, including subjects, objects, mediating artifacts, rules, community, and the division of labor. The 20 selected studies are summarized in Table 1 and Table 2. Table 1 documents the subject and object data aspects of activity theory. The subjects including the degree status and the number of participants in the studies, while the object mainly refers to the learning outcomes of participants that involved in the studies. Table 2 documents the mediating artifacts, rules, and community data aspects of activity theory. In most cases, the selected studies provided some information relating to the six components of activity theory. However, some studies lacked relevant information to describe a certain component, usually because that activity theory component was outside the scope of research in the selected study.

TABLE I. DOCUMENTATION OF SUBJECT AND OBJECT DATA

No.	Study (year)	Subject		Object
		Degree status	N	Learning outcomes
1	Ward & Tatsukawa（2003）	Undergrad	24	Subjects rated the note-taking system highly and some prefer the system to pencil and paper.
2	Christ, Weber, & Sato (2012)	Undergrad	25	Treatment supports the experience of creativity and synthesis and comprehension skills.
3	Rody (2013)	High school	5	The difference is small, control earned higher scores.
4	Bui, Myerson, & Hale (2013)	Undergrad	228	Treatment record the contents and ideas in the learning process in more detail, and the instant test without review can recall more facts.
5	Alvarez et al. (2013)	Primary school	12	Treatment showed substantial progress in their ability to solve fraction problems.
6	Mueller & Oppenheimer (2014)	Undergrad	325	Control grades significantly exceeded treatment grades.
7	Barrett et al. (2014)	Undergrad	79	No difference observed. The consistency of the tools used for note-taking and testing works best. Students are strongly inclined to use computers in class.
8	Orndorff III (2015)	Undergrad	247	Treatment improves grades and related learning outcomes.
9	Paek & Fulton (2016)	Primary school	20	Students accept the note-taking system.
10	Van Dyke & Smith-Carpenter (2017)	Undergrad	43	Most of the students surveyed (70%) choose to use a note-taking system instead of paper notebooks.
11	Horwitz (2017)	Undergrad	24	No difference in test scores. Treatment outperformed control in factual questions.
12	Pettit-O'Malley, Liesz, & Sisodiya (2017)	Undergrad	82	Control grades significantly exceeded treatment grades.
13	Huang, Su, Yang, & Liou (2017)	Primary school	64	Treatment grades significantly exceeded control grades. There was no significant difference in learning motivation and attitude.
14	Mfaume, Bilinga, & Mgaya (2018)	Undergrad	310	Mobile phone photo taking is a common practice, but it affects students' writing and homework organizing ability.
15	Luo et al. (2018)	Undergrad	126	Treatment grades exceeded control grades in text-based learning. Control grades exceeded treatment grades in image-based learning.
16	Desselle & Shane (2018)	Undergrad & Postgraduate	86	Control grades significantly exceeded treatment grades.
17	Sun & Li (2019)	High school	72	Treatment grades significantly exceeded control grades.
18	Pyörälä et al. (2019)	Undergrad	176	Students valued digital note-taking with a mobile device. Efficient digital note-taking practices were pivotal to students in becoming mobile learners.
19	Artz, Johnson, Robson, & Taengnoi (2020)	Undergrad	460	No difference observed in test scores. The difference between treatment and control was not in choosing a computer.
20	Shi, Yang, Yang, Liu, & Yang (2020)	Undergrad	42	Treatment grades significantly exceeded control grades.

TABLE 2. DOCUMENTATION OF MEDIATING ARTIFACTS, RULES AND COMMUNITY DATA

No.	Study (year)	Mediating artifacts	Rules		Division of labor	Community
		Classroom tools	Course subject	Nation	Group setting	Socialization/ Classroom climate
1	Ward & Tatsukawa（2003）	Note-taking system	Engineering	USA	Single	Not within the research scope
2	Christ, Weber, & Sato (2012)	Electronic revision and recapitulation tools	Biopsychology	Germany	Single	Not within the research scope
3	Rody (2013)	Digital pen	Biology	USA	Single	Not within the research scope
4	Bui, Myerson, & Hale (2013)	Computer	Image & Text	USA	Not specified	Not within the research scope
5	Alvarez et al. (2013)	Digital pen and CSCL system	Mathematics	Sweden	Group	Treatment helps to improve students' confidence and participation.
6	Mueller & Oppenheimer (2014)	Computer	TED Talks	USA	Single	Not within the research scope
7	Barrett et al. (2014)	Computer	Cognitive psychology	USA	Not specified	Not within the research scope
8	Orndorff III (2015)	Cloud-based collaborative note-taking system	Social Sciences	USA	Single	Treatment facilitated collaborative teamwork
9	Paek & Fulton (2016)	Note-taking system	Science	USA	Single	Treatment increased participation
10	Van Dyke & Smith-Carpenter (2017)	Cloud-based note-taking system	Biochemistry	USA	Single	Treatment facilitated collaborative teamwork
11	Horwitz (2017)	Computer	Psychology	USA	Single	Not within the research scope
12	Pettit-O'Malley, Liesz, & Sisodiya (2017)	Computer	Business	USA	Group	Not within the research scope
13	Huang et al. (2017)	Digital pen learning system	Mathematics	China	Group	Not within the research scope
14	Mfaume, Bilinga, & Mgaya (2018)	Mobile phone	Not specified	Tanzania	Not specified	Treatment distract students' attention and reduce class attendance
15	Luo et al. (2018)	Computer	Educational psychology	USA	Single	Treatment happier
16	Desselle & Shane (2018)	Computer	Administration	USA	Not specified	Treatment distracted
17	Sun & Li (2019)	Mobile devices	Computer Science	China	Single	Not within the research scope
18	Pyörälä et al. (2019)	Mobile devices	Medical Science	Finland	Not specified	The visual nature of learning materials stimulated learning.
19	Artz et al. (2020)	Computer	Economics	USA	Single	Not within the research scope
20	Shi et al. (2020)	Cloud-based note-taking system	Computer	China	Group	Treatment increased participation

A thorough review of the 20 selected studies found that digital note-taking gradually occupy classroom learning activities and have great impacts on students' learning outcomes. Among which, 6 studies examined students' affective learning outcomes, 3 studies examined students' behavioral learning outcomes, and 13 studies examined students' cognitive learning outcomes. It should be noted that two studies examined both student affective and cognitive learning outcomes.

Six studies examined students' affective learning outcomes by exploring their attitudes toward digital note-taking. It's found that students are strongly inclined to use PCs to take notes in class (Barrett et al., 2014). Paek and Fulton (2016) further found that students could accept digital note-taking systems for note-taking. Due to the convenient operation and rich functions of digital notes, students can record whatever they see and learn, and share whatever they hear and think anytime and anywhere (Pyörälä et al. , 2019). Therefore, compared with traditional pen and paper, most students prefer to use digital note-taking (Van Dyke & Smith-Carpenter, 2017; Ward & Tatsukawa, 2003). However, Huang et al. (2017) found that there was no significant difference in learning attitude and motivation between digital note-taking and traditional note-taking.

Three studies examined student behavioral learning outcomes in terms of the cultivation of students' skills and abilities. Christ, Weber, & Sato (2012) pointed out that using digital note-taking can cultivate students' creativity and improve their comprehensive ability and understanding ability. Alvarez et al. (2013) found that the students' ability to solve the score problem by using digital note-taking has made substantial progress, and students' self-confidence and participation have been improved. Moreover, Mfaume, Bilinga, & Mgaya (2018) argued that if students just take pictures with their mobile phones, it will affect students' writing and homework organizing ability.

Thirteen studies examined student cognitive learning outcomes. Research shows that digital note-taking can improve students' learning achievements, but may also reduce their learning achievements. There is evidence that shows students' learning effect has greatly improved due to the use of digital notes (Orndorff III, 2015; Shi et al. 2020; Sun & Li 2019). Because students record the contents and ideas in the learning process in more detail, the instant test without review can recall more facts (Bui, Myerson, & Hale, 2013). In particular, the use of digital pen to take notes can greatly improve students' academic performance (Huang et al., 2017). However, some studies found that students who used traditional notes performed better than those who used PCs to take notes (Desselle, 2018; Mueller, 2014; Pettit-O'Malley, 2017). In some cases, due to the different types of learning materials, students should choose the appropriate way to take notes (Luo et al., 2018). Additionally, some studies show that there is little or no difference in students' learning outcomes whether they use digital notes or paper notes (Artz, Johnson, Robson, & Taengnoi, 2020; Barrett et al., 2014). They believe that learning outcomes are the best when the tools used for taking notes and testing are consistent (Barrett et al., 2014).

Some studies have proposed questions to direct future research with digital note-taking. For example, Paek and Fulton (2016) asked that are there any technical, practical, or instructional challenges

in the collaborative sharing of digital note-taking in a classroom environment? and how to integrate digital note-taking applications into classroom learning? Ward and Tatsukawa (2003) focused on what software and hardware features are required to support note-taking? And is it possible to build a successful note-taking application today using common hardware? With the widespread use of digital notes, how do students take notes and how teachers manage students to make notes cooperatively (Orndorff III, 2015)? Artz et al. (2020) thought that how the medium of note-taking affects learning outcomes will continue to be an important area for further research as technology continues to change. In addition to studying the impact of digital note-taking on learning, great attention should be paid to figure out how students use digital note-taking and how to create a learning environment based on digital note-taking.

CONCLUSION

Based on the evidence gathered in the present literature review, the present study examined the effects of digital note-taking on students' learning outcomes from three aspects. In terms of cognition, digital note-taking can improve students' academic performance, but it may reduce students' academic performance if they only use computer keyboard input. In terms of affect, most students are willing to use digital note-taking, and digital note-taking can improve students' self-confidence and participation in classroom instruction. In terms of behaviour, it's found that digital note-taking can cultivate students' creativity, understanding abilities, and teamwork abilities.

It is increasingly urgent to study and understand the digital note-taking and find solutions in the learning process. At present, most studies focus on the comparison between digital note-taking and traditional note-taking or introduce the software, function, and advantages of digital note-taking. However, the development of digital note-taking is influencing students' learning activities imperceptibly. In classroom learning, we should start from the needs of students and study how to use digital notes according to the learning content.

REFERENCES

Alvarez, C., Salavati, S., Nussbaum, M., & Milrad, M. (2013). Collboard: Fostering new media literacies in the classroom through collaborative problem solving supported by digital pens and interactive whiteboards. *Computers & Education, 63*: 368-379

Artz, B., Johnson, M., Robson, D., & Taengnoi, S. (2020). Taking notes in the digital age: Evidence from classroom random control trials. *The Journal of Economic Education, 51*(2), 103-115

Barrett, M. E., Swan, A. B., Mamikonian, A., Ghajoyan, I., & Youmans, R. J. (2014). Technology in note taking and assessment: The effects of congruence on student performance. *International Journal of Instruction, 7*(1), 49-58.

Bui, D. C., Myerson, J., & Hale, S. (2013). Note-taking with computers: Exploring alternative strategies for improved recall. *Journal of Educational Psychology, 105*(2): 299.

Christ, O., Weber, C., & Sato, T. (2012). Evaluation of fostering students' creativity in preparing aided recalls for revision courses using electronic revision and recapitulation tools 2.0. *Behaviour & Information Technology, 31*(7-9): 791-797.

Desselle, S. P., & Shane, P. (2018). Laptop versus longhand note taking in a professional doctorate course: Student performance, *Attitudes, and Behaviors, 95*: 1102-1111.

Di Vesta, F. J., & Gray, G. S. (1972). Listening and note taking. *Journal of Educational Psychology, 64*(1): 8-14.

Fried, C. B. (2008). In-class laptop use and its effects on student learning. *Computers & Education, 50*(3): 906-914.

Grahame, J. A. (2016). Digital note-taking: discussion of evidence and best practices. *J Physician Assist Educ, 27*(1): 47-50.

Horwitz, S. M. (2017). Is note-taking more effective with a keyboard or a pen? *Undergraduate Honors Theses.* 1369.

Huang, C. S. J., Su, A. Y. S., Yang, S. J. H., & Liou, H. H. (2017). A collaborative digital pen learning approach to improving students' learning achievement and motivation in mathematics courses. *Computers & Education, 107*, 31-44.

Keengwe, J., & Kang, J. J. (2013). A review of empirical research on blended learning in teacher education programs. *Education and Information Technologies, 18*(3), 479-493.

Luo, L. L., Kiewra, K. A., Flanigan, A. E., & Peteranetz, M. S. (2018). Laptop versus longhand note taking: effects on lecture notes and achievement. *Instructional Science, 46*, 947-971.

Mfaume, H., Bilinga, M., & Mgaya, R. (2018). From paper and pencil to mobile phone photo note-taking among Tanzanian university students: Extent, motives and impact on learning. *International Journal of Education and Development using Information and Communication Technology, 14*(2), 83-98

Mueller, P. A., & Oppenheimer, D. M. (2014). The pen is mightier than the keyboard advantages of longhand over laptop note taking. *Psychological Science, 25*(6), 1159-1168.

Orndorff III, Harold N. (2015). Collaborative note-taking: the impact of cloud computing on classroom performance. *International Journal of Teaching & Learning in Higher Education, 27*(3), 340-351

Paek, S., & Fulton, L. A. (2016). Elementary students using a tablet-based note-taking application in the science classroom. *Journal of Digital Learning in Teacher Education, 32*(4), 140-149

Patterson, R. W., & Patterson, R. M. (2017). Computers and productivity: Evidence from laptop use in the college classroom. *Economics of Education Review 57*, 66-79

Pettit-O'Malley, K. L., Liesz, T. J., & Sisodiya, S. R. (2017). The relative efficacy of handwritten versus electronic student classroom notes. *Business Education Innovation Journal, 9*(2), 110-120

Pyörälä, E., Mäenpää, S., Heinonen, L., Folger, D., Masalin, T., & Hervone n, H. (2019). The art of note taking with mobile devices in medical education. *BMC Medical Education, 19*(1): 96.

Rody, C. A. (2013). Digital assist: A comparison of two note-taking methods (traditional vs. digital pen) for students with emotional behavioral disorders. *Proquest LLC,* 119.

Shi, Y., Yang, H., Yang, Z., Liu, W., Yang, H.H. (2020). The effects of a collaborative learning approach with digital note-taking on college students' learning achievement and cognitive load. In: *Cheung S., Li R., Phusavat K., Paoprasert N., Kwok L. (eds) Blended Learning. Education in a Smart Learning Environment. ICBL 2020. Lecture Notes in Computer Science, vol 12218. Springer, Cham.*

Stacy, E. M., & Cain, J. (2015). Note-taking and handouts in the digital age. *American Journal of Pharmaceutical Education, 79* (7): 107.

Sun, D., & Li, Y. (2019). Effectiveness of digital note-taking on students' performance in declarative, procedural and conditional knowledge learning. *International Journal of Emerging Technologies in Learning, 14*(18), 108-119.

Van Dyke, A. R., & Smith-Carpenter, J. (2017). Bring your own device: A digital notebook for undergraduate biochemistry laboratory using a free, cross-platform application. *Journal of chemical education, 94*, 656-661.

Van Meter, P., Yokoi, L., & Pressley, M. (1994). College students' theory of note-taking derived from their perceptions of note-taking. *Journal of Educational Psychology, 86*(3): 323-338

Ward, N., & Tatsukawa, H. (2003). A tool for taking class notes. *International Journal of Human-Computer Studies, 59*(6): 959-981.

Webster, J., & Watson, R. T. (2002). Analyzing the past to prepare for the future: writing a literature review. *MIS Quarterly, 26*(2), 13-23.

Yang, J., Jody, C. M., Bryan, K., Baker, R. S., Luc, P. & Jaclyn, O. (2018). Note-taking and science inquiry in an open-ended learning environment. *Contemporary Educational Psychology, 55*, 12-29.

A University Course to Cultivate Students' Inquiry-mind When Writing News Stories

Xiaohong Zhang
Windyzhang0929@gmail.com
Project Researcher
Research Center for Instructional Systems, Kumamoto University
Kumamoto, Japan

Kaoru Matsubayashi
kaoru.matsubayashi@gmail.com
Visiting Professor
The Graduate School of Information and Communication
Tokyou, Japan

Inquiry-mind is an important attitude to have when students write news reports in a journalism course. The purpose of this study was to examine whether the students' inquiry-mind improved in the designed course. This research used a Japanese university course called, "Internet Journalism in Practice", as a case study. The goal of this course was to cultivate journalistic skills in internet media. The authors used mix method to analyze the data. T-tests were used to analyze the data in pretest, midtest and posttest. Furthermore, the authors took fieldnotes to identify the interactions between teachers and students. As a result, the authors found that inquiry-mind was improved through comparison between pretest, midtest, and posttest. The teacher's scaffolding of the course, realistic simulation of students as journalists, affinity topic for students, and game element were the reasons why this course fostered students' inquiry-mind.

Key words: Inquiry-mind, Writing skills, News stories, Journalism, Course design

1. INTRODUCTION

With the development of the internet, online reporting played the role previously held by traditional mass media. Therefore, there has been a concerted effort in educational fields about how to write news stories on the internet. When writing good news stories, students need to make efforts to inquire about what kind of news reports are good reports and how to write them. Thus, it is crucial to design a course to improve students writing skills and foster their inquiry-mind.

2. REVIEW ANALYSIS

When writing news reports (hard news) or features (soft news), journalists need to analyze the data, judge and choose important or valuable information, and use easily understood words to inform to the public (Mencher,2008). Thus, to be a journalist, writing skills and critical thinking are basic skills (Pierce, & Miller, 2007).

In the collecting, analyzing and writing process, both critical thinking skills and critical thinking altitude are necessary (Ennis, 1987). However, skills can be developed through training, but altitude could not. To foster students' critical thinking altitude, need to create critical thinking culture in the course that

allow students emerging in active participation (Buckingham, 2003).

Inquiry-mind, the mind setting of inquiring new ways or perpective, is an important altitude in critical thinking altitude need to improve (Ennis, 1987; Hirayama, Kusumi, 2004; Witschge, Deuze, & Willemsen, 2019). Thus, attention needs to be paid to developing course design to foster students' inquiry-mind to improve article writing in university education.

The purpose of this study is to examine the effectiveness of course design. To attain this research objective, the authors used a case study approach in a journalism course at a Japanese university. Two research questions driving this study are:

(1) Was students' inquiry-mind fostered?

(2) Why was students' inquiry-mind fostered?

By further clarifying the research questions hypothesis, this design can be used by other university lecturers, who hope to foster students' inquiry-mind in the media literacy lessons in the future.

3. RESEARCH METHODS

3.1 Case Study of "Internet Journalism in Practice" Course

This research examined a media literacy course called "Internet Journalism in Practice" during the autumn term in 2018 as a case study. "Internet Journalism in Practice" was a training course to foster skills for writing news stories to be a journalist in the future at K University in Japan. The goals of this course were (1) learning basic knowledge and skills about interview and writing news reports using internet; (2) fostering students' inquiry-mind to trigger students to investigate in person, critically analyze and inform the facts to the readers. The students in the class were sophomores, juniors and seniors. This course was designed with 14 lessons in a term. One lesson was 90 minutes. Thirty undergraduates participated in this course during the autumn term in 2018. To support the students' inquiry how to write news report better in practice, the course was designed to teach knowledge and skills with writing activities, using these skills collaboratively in teams, with support from the teacher (Table 1)

3.2 Research Design

To clarify the research questions, the authors designed this study based on sequential explanatory design. Sequential explanatory design has the benefit of exploring the reasons for chages(Sueda, Kawai, Tasaki, & Saruhashi, 2012). In this study, the authors conducted field work after a questionnaire investigation.

3.3 Data Collection and Analysis in Questionnaire Investigation

A questionnaire about Inquiry-mind Scale of Critical Thinking based on Hirayama and Kusumi was developed (Hirayama, Kusumi, 2004). The Scale of Inquiry-mind include ten items. The items included "learned many things through communication with different people", "was interested in the opinions that differ from theirs", and "was interested in discussing topics with different people in the course". Students answered using a five-point scale (Strongly agree, agree a little, neither agree nor disagree, disagree a little, strongly disagree). The scores were analyzed from five to one with five given to strongly agree and 1 to strongly disagree. Students received questionnaires three times, the pretest, midtest and posttest. The pretest, midtest and posttest occurred after the first, seventh, and last lesson, respectively. Of the questionnaires returned, 15 of 30 were valid. A t-test was used to statistically analyze the data.

3.4 Data Collection and Analysis in Field Work

The first author conducted participation observation in the course and wrote fieldnotes. Then, fourteen field notes from each lesson was collected. The analysis procedure was as follows: (1) Divide the data based on meaning and attach focused codes; (2) Create and label axial codes based on the focused codes; and (3) Identify theoretical codes (Charmaz, 2014). From the analysis, twelve axial codes were created from the focused coding. Five theoretical codes were created based on the axial codes. The authors quoted the theoretical codes in bold type and cited the fieldnotes data with italic type.

Table 1 Teaching and learning activities in Internet Journalism in Practice

No	Lesson Goals	Teacher's teaching and support	Learning activities
1		Guidance	Game of drawing images based on words
2	Writing reports about products	Using meta perspective to reflect on your thought; 5W1H, leading sentences, Inverted Triangle writing	Using Inverted Triangle to write report about a new chocolate candy
3	Writing quick reports	Skills of how to write memos and choose information	Making a quick report based on Osaka mayor's press conference
4		Three value factors of news reporting	Writing a quick report about wild boar hurting an undergraduate student in K University through a simulated interview
5	Writing book reviews	Skills of writing an introduction, the main issue and a conclusion; The method of speed reading	Reading a new book that was recommented by other students and writing a book review
6	Writing simple, easy to read articles	Methods that make articles easy to read	Rewriting articles of Japan's constitution by using easily understanding expressions
7	Editing the articles	Methods of editing, proofreading, and use of WorldPress	Editing articles that were written by other students and upload them to WorldPress
8	Writing interview reports about entrance exam study	Stucture of interview, the four-part organization of Chinese poetry (kishotenketsu)	Writing a report about an interview using Skeleton; Topic: entrance exam study times of K University
9		Using episode; Ways of asking questions	Writing the report about an interview of the entrance exam study schedule of K University
10	Writing features about job hunting	Writing method of the WSJ (Wall Street Journal); cassette way to finish an article that some people work together	Deciding group topics by adding interesting topics with job hunting(for example: job hunting+Local language, job hunting+music); making plans for an interview.
11		Supporting students by team	Writng features using WSJ method 1: discussing the results of interviews in groups
12		Supporting students by team	Writng features using WSJ method 2: discussing the results of interviews in groups, consulting with experts (the teacher and two teaching assistants)
13		Supporting students by team	Writing features using WSJ method 3: final revision and upload to WorldPress
14			Presentation with Questions and Answers at the end

4. RESULTS AND DISCUSSION

From the analysis of *t* test, significant differences were found between the pretest and midtest, the midtest and posttest, and the pretest and posttest in the students' inquiry-mind. The difference between the pretest and midtest was significant ($t = 2.36$, df = 14, $p < .05$). The difference between the midtest and posttest was significant ($t = 3.82$, df = 14, $p < .01$). The difference between pretest and posttest was significant ($t = 4.40$, df = 14, $p < .01$). These results indicated that students' inquiry-mind was fostered in this course.

From the analysis of fieldnotes, four elements in the course, **the teacher's scaffolding of the course**, realistic **simulation as journalists**, **affinity topic for students**, **game element**, were related to the students' inquiry-mind. (1) **The teacher's scaffolding of the course. The teacher's scaffolding of the course** was the support that triggered students to further inquire and write better articles. In the teacher's scaffolds, there were three types of support, including reflection on past lessons, guiding based on situations, and some rules, tables and figures that helped students to create images. (2) **The realistic simulation as journalists**. Realistically simulating interviews, uploading the reports to a dummy site, and time limitation of writing reports allowed students to change their roles from students to journalists in a concrete classroom situation. **(3) Affinity topic for students**. The topics, such as stories and events about entrance exam at K University and hunting jobs were easily understood and helped students focused on how to write journalistic articles. (4) **Game element**. Game elements, such as drawing images and drawing lots, made students relaxed, have fun and feel safe to try to improve their articles.

5. CONCLUSION

This study examined the design of "Internet Journalism in Practice" that cultivated students' inquiry-mind. **The teacher's scaffolding of the course**, **the realistic simulation as journalists**, **affinity topic for students**, **game element**, were the reasons why this course fostered students' inquiry-mind. This study only focused on the changes of inquiry-mind through the comparison of pretest, midtest and posttest. However, this study did not examine the articles students wrote. Future studies can examine contents analysis of the students' articles.

REFERENCES

1. Buckingham, D. (2003). Media education: literacy, learning and contemporary culture. Polity Press, UK
2. Charmaz, K. (2014). Constructing grounded theory. California: SAGE Publications, Inc.
3. Ennis, R. H. (1987). A taxonomy of critical thinking dispositions and abilities. In J. B. Baron & R. J. Sternberg (Eds.), Series of books in psychology. *Teaching thinking skills: Theory and practice*. W. H. Freeman and Company, pp. 9–26. W H Freeman/Times Books/ Henry Holt & Co.
4. Kusumi,T., Tanaka, Y. & Hirayama, R. (2012). Teaching critical thinking in the first-year experience of higher education. *Cognitive Studies*. 19(1), 69-82.
5. Mencher, M. (2008). Melvin Mencher's News Reporting and Writing (11th Eleventh Edition). New York: McGraw-Hill Education. Mills, J
6. Pierce, T. & Miller, T. (2007). Basic Journalism Skills remain important in hiring. Newspaper Research Journal, 28(4), 51-61.
7. Sueda, K., Kawai, H., Tasaki, K. & Saruhashi, J. (2012). Research methods in communication studies. Kyouto: Nakanishiya-sya.
8. Witschge, T., Mark Deuze, M., & Willemsen, S. (2019). Creativity in (Digital) Journalism Studies: Broadening our Perspective on Journalism Practice. Digital Journalism, 7(7), 972-979.

Stepping Backward to Move Forward: Developing Media Instructions with the Backward Design Framework

Sarinporn Chaivisit
yam.chaivisit@okstate.edu
Doctoral student
Oklahoma State University
Stillwater, USA

This study demonstrates the ways in which to improve media instructions by applying the Backward Design Framework in an online course on utilizations of cutting-edge technologies. It suggests strategies and best practices to develop the course, which is offered to undergraduate students to learn and be able to demonstrate uses of contemporary digital media and technologies in their future professions. It analyzes and demonstrates processes on how to develop media instructions through a lens of the Backward Design Framework. The study aims to discuss the development of media instructions in order to improve students' outcomes. The results of this study reveal an updated course lesson and discussions on how to implement the framework into the lesson. This study can be helpful for educators who plan to develop media instructions and utilize technologies in their online courses.

Keywords: Developing media instructions, Backward Design Framework, Instructional design

INTRODUCTION

Interest in the improvement of media and technology in education has been nationally focused (Cronbach, 2000; US Department of Education, 2020). Professional educators are always interested in improving their courses for their students (Morgan, 2008). This paper presents an improvement plan on instructions for the online course on Applications of Technologies and Media through the Backward Design Framework. The purpose of this course is for students to demonstrate the use of contemporary technologies and digital media in their fields by producing artifacts that illustrate the knowledge and skills of using multimedia, social media, and web development tools. The course is offered to undergraduate students in a public land-grant research university in the south-central region of the United States of America. The Backward Design Framework is used to guide the instructor to develop course instructions. The aim of this framework is to equip educators to design instruction that is effective and assists students to achieve the desired learning outcomes (Wiggins & McTighe, 2005). The Backward Design Framework is a strategy that guides teachers to design instruction that will enable students to achieve objectives focusing on student-centered learning (Reynolds & Kearns, 2017). This framework can be applied in classrooms across grade levels and subject areas (Childre, Sands, & Pope, 2009). Teachers can expect what students should be able to do when they complete the lesson based on the learning objectives. This

framework helps teachers consider the criteria in which students tend to reach the learning goals. It assists teachers to plan their teaching, which allows students to accomplish the assessment by demonstrating their learning successfully (Harvard University's Derek Bok Center for Teaching and Learning, n.d.). The details of the framework and plan for improvements are discussed in the following section.

RESEARCH DESIGN & METHODS

Educators are considered as designers (Henriksen & Richardson, 2017; Wiggins & McTighe, 2006). They design instruction in order to promote students' learning experiences to reach the course's desired goals or national standards. As is the case with other design professions like engineering or architecture, educational designers should strongly focus on their audiences as student-centered (Wiggins & McTighe, 2006). Their accomplishment of designs is based upon how students have achieved learning goals. The Backward Design Framework was selected because of its simplicity and effectiveness to assist students to achieve specific results. The three steps of the Backward Design Framework developed by Wiggins and McTighe (2006) are (1) identifying desired results, (2) determining acceptable evidence, and (3) planning learning experiences and instruction. Data is collected through an analysis of the Backward Design in each stage.

A backward template for unit design was used as a structural foundation. This template consists of three stages. The first stage is the *desired results*. In this stage, educators establish relevant goals such as content standards, course objectives, and learning outcomes. The key concepts are that students will understand, know, and be able to do tasks related to the desired goals. Additionally, educators provide essential questions that will foster students' understanding. The second step is the *assessment evidence.* Educators address performance tasks and other evidence that students demonstrate the accomplishment of the desired understandings such as quizzes, homework, journals, or tests. The last stage is the *learning plan.* This stage includes learning activities such as instruction and learning experiences that will enable students to meet the desired results (Wiggins & McTighe, 2006). These three stages were implemented in the development plan.

DATA ANALYSIS

This analysis presents the process of adopting the Backward Design Framework. It aims to develop engaging course materials and provide activities that enable students to use technology. It highlights on the first module of the course as a sample practice of the framework, which is asynchronous communication. In this module, students will learn that asynchronous communication is a type of communication that does not happen in real time, such as emailing or texting. Students will get familiar with asynchronous tools such as posting video messages on Flipgrid and receiving or sending text messages on Remind. Students will practice using Flipgrid to introduce themselves to classmates and talk

about their expectations to apply technology in their future careers. They will also set up their accounts on Remind in order to receive text messages from the class announcements and communicate with the instructor. Additionally, the instructor will introduce asynchronous tools through a VoiceThread lecture. Based on the Backward Design Framework, the instructor follows the three stages including (1) desired results, (2) assessment evidence, and (3) learning plan. In the first stage, the instructor establishes the goals and essential questions. To do so, the instructor addresses the learning objectives and essential questions in the course overview section. In the second step, the instructor establishes assessments to measure students' understanding of asynchronous communication. To do so, the instructor assigns students to take a quiz, sign up on a Remind account, and post videos and responses on Flipgrid. In the third step, the instructor creates a lesson plan that supports students to reach the learning objectives. To do so, the instructor provides media instructions including a weekly update video and a VoiceThread lecture. The detail based on the Backward Design framework is demonstrated in the results section.

RESULTS

The results illustrate best practices based on implementing the Backward Design Framework to improve the course instruction. *Table 1* shows three stages of the framework on the asynchronous communication lesson.

Table 1: Asynchronous Communication Lesson Based on Backward Design Framework

<table>
<tr><th colspan="2">Stage 1 - Desired Results</th></tr>
<tr><td colspan="2">Established Goals:
- The student will be able to utilize asynchronous communication tools.</td></tr>
<tr><td>Understanding:
Students will understand…
- the meaning of asynchronous communication.
- the concept of asynchronous communication tools.</td><td>Essential Questions:
- How can you use asynchronous communication tools in a workplace?</td></tr>
<tr><td>Students will know that...
- asynchronous tools enable communication and collaboration over a period of time through a "different time-different place" mode.</td><td>Students will be able to…
- use asynchronous tools such as Remind and Flipgrid.
- classify and apply the concept of asynchronous tools.</td></tr>
<tr><th colspan="2">Stage 2 - Assessment Evidence</th></tr>
</table>

Performance Tasks:	**Other Evidence:**
- Set up Remind account - Post an introductory video and responses on Flipgrid	- Take a syllabus quiz - Answer asynchronous communication questions in a lecture video

Stage 3 - Learning Plan

Learning Activities:

1. The student will log in on Canvas and view course materials. This home page includes links to learning content and activities. On the right side of the list, the student will check those check marks once they have completed each activity.

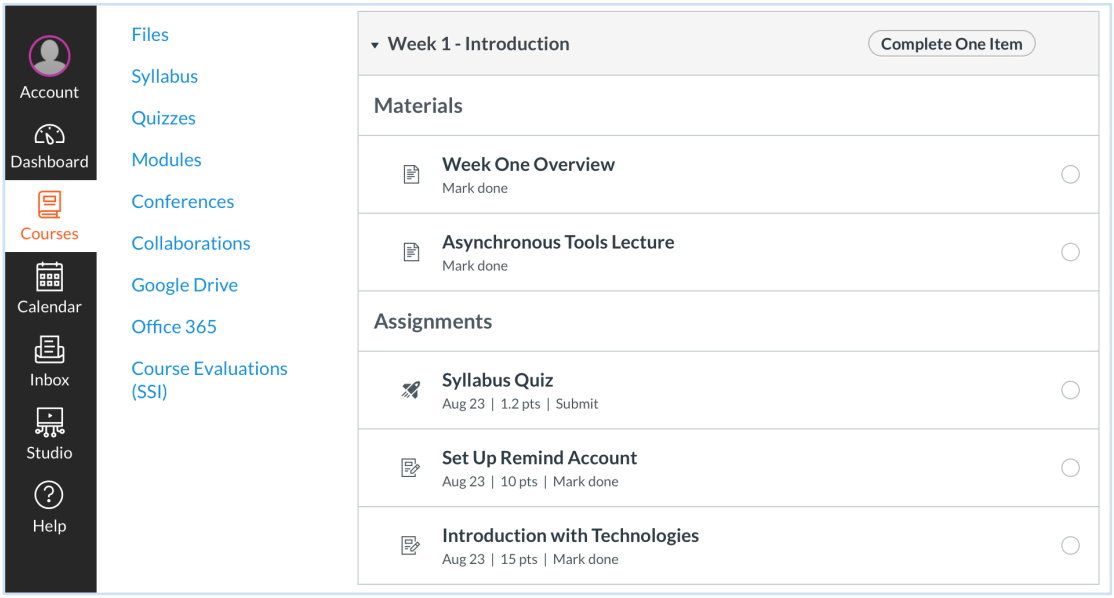


Figure 1. Home page on Canvas demonstrating Week 1 materials.

2. The student will listen to a video lecture on how to navigate the online course and learn about asynchronous tools. The student will analyze online workplace communication tools by classifying those tools as either synchronous or asynchronous tools while they watch a video lecture. For example, communications that take place in real time are synchronous communications, whereas communications that are previously recorded or written are asynchronous communications. Questions will be embedded in a lecture video.

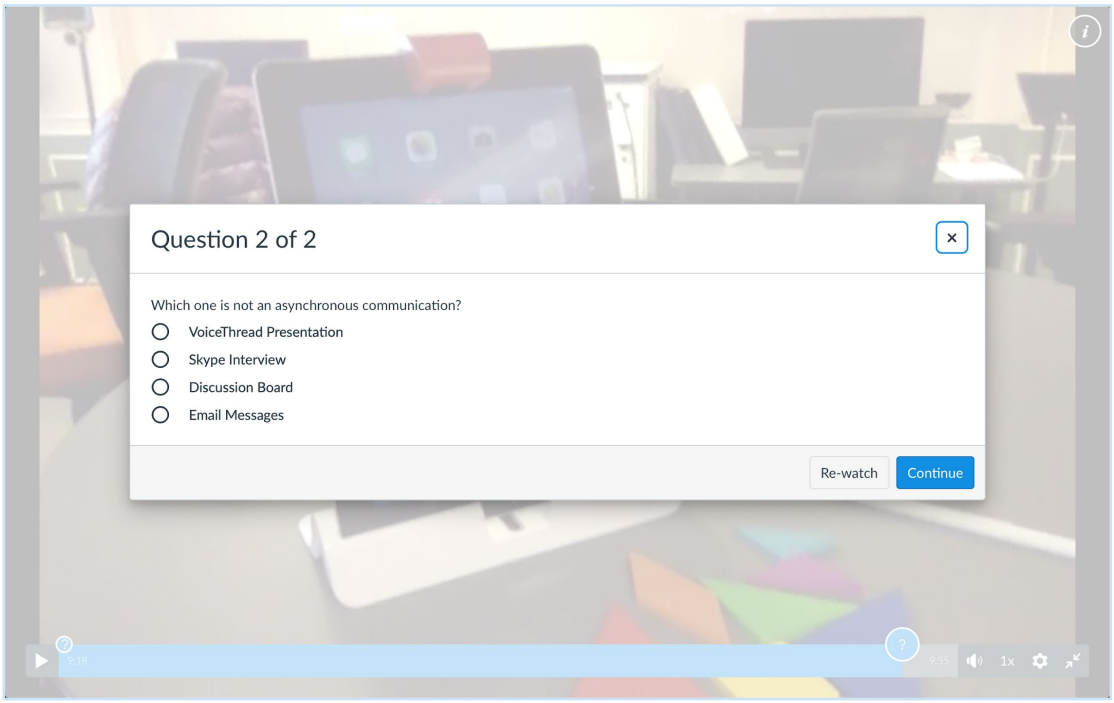


Figure 2. Questions embedded in a lecture video

3. The student will view a presentation on VoiceThread about asynchronous communication tools. This lecture includes an uploaded PowerPoint with a voice-over that students can listen to while reviewing the presentation slides. It enables instructors to upload the slide and add drawings or highlights on the slides while recording voice-overs. It allows students to listen to a lecture and add comments.

Figure 3. An asynchronous lecture on VoiceThread.

4. The student will take a syllabus quiz to demonstrate their understanding of the course overview and how to use an online course.

5. The student will set up a Remind account in order to communicate with the instructor through text messages on their phones. The instructor uses an avatar in text messages to engage students.

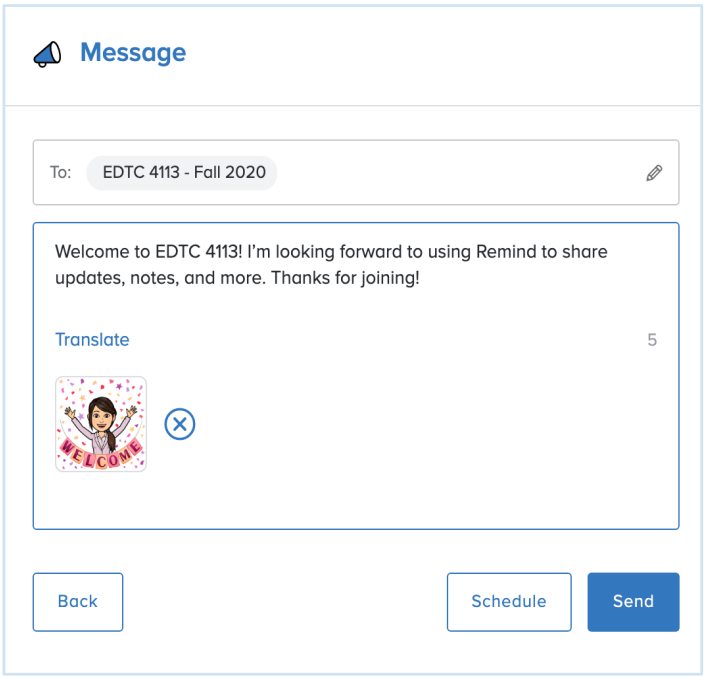


Figure 4. A sample message on Remind

6. The student will create a short recording video to introduce themselves and how they use technology today and in the future through Flipgrid and respond to their peers.

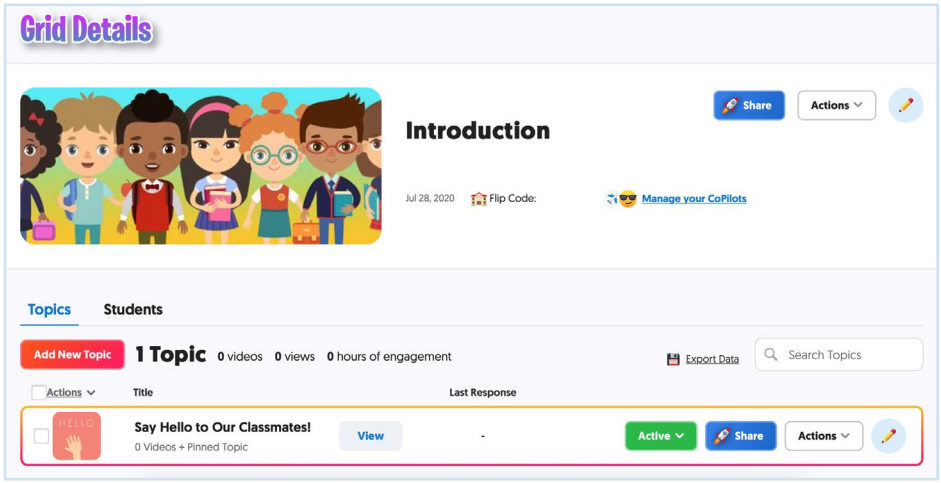


Figure 5. Flipgrid dashboard

By using a Backward Design template as a model, the instructor was able to design the lesson covering the expected results, assessments, and learning activities for students to achieve the learning objectives. In this lesson, students will be able to utilize the use of asynchronous communication tools.

They will take assessments through taking a quiz, setting up a Remind account, and posting video messages on Flipgrid. They will learn through Canvas Learning Management Platform and explore materials including video and VoiceThread lectures. According to the course goals, students are expected to understand basic applications of cutting-edge technologies and media as well as create artifacts that can be utilized in their future careers with good intention. The assessments can be quizzes, online presentations, discussions, and artifacts that students produce throughout the course. Those artifacts include personal websites, editing images, and video productions. In order to achieve the learning goals, the instructor facilitates teaching through online lectures, video instructions, article readings, and clear directions. The data analysis reveals that the Backward Design Framework is able to help the instructor to design appropriate course instructions, assessments, and activities based on the learning objectives. Overall, the aims of this study are to develop media instructions for students to excel and apply uses of media and technologies in their professions. Students in the course are from various areas of study. The majority of them are in health promotions. This project will be beneficial for students in the class as well as a guide for educators and instructional designers to develop instructions to meet the desired goals.

ACKNOWLEDGEMENTS

I am grateful for my advisor, Dr. Penny Thompson, and my colleagues, Younglong Kim and Thanh Do, for comments and suggestions that greatly improved the proceeding.

REFERENCES

Cronbach, L. J. (2000). Course improvement through evaluation. In *Evaluation models* (pp. 235-247). Springer, Dordrecht.

Harvard University's Derek Bok Center for Teaching and Learning. (n.d.). *Backward Design.* Retrieved from https://bokcenter.harvard.edu/backward-design.

Henriksen, D., & Richardson, C. (2017). Teachers are designers: Addressing problems of practice in education. *Phi Delta Kappan, 99*(2), 60-64.

Morgan, P. (2008). The Course Improvement Flowchart: A Description of a Tool and Process for the Evaluation of University Teaching. *Journal of University Teaching and Learning Practice*, *5*(2), 1-14.

US Department of Education. (2020). *National Education Technology Plan.* Retrieved from https://tech.ed.gov/netp/.

Wiggins, J., McTighe, G., & McTighe, Jay. (2005). Understanding by design (Expanded 2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Designing Online Learning Experiences from Scratch: Challenges, Lessons, and Opportunities

Danilo M. Baylen
dbaylen@westga.edu
Professor
University of West Georgia
Carrollton, Georgia USA

This case study described the elements considered in designing and developing a blended course experience given limited infrastructure, support, and resources. In delivering the graduate-level course, the funding agency recruited a cohort of graduate students from ASEAN countries, such as Indonesia, Myanmar, the Philippines, Taiwan, and Thailand. Students enrolled in the graduate course studied global librarianship as a requirement for completing a library science master's degree with a specialization in theological librarianship at a central Philippines university. The article described the course design process, including content and activities. The researcher discusses the elements considered in course design, such as students' background, knowledge, and technology literacy skills. The researcher also explained the decisions made about tools and applications used to support course delivery at a distance. Further, the article addressed how the researcher managed the diversity of the student characteristics and contexts as assets or barriers to a positive academic experience. Finally, the researcher discusses the challenges, lessons, and opportunities from the experience of designing, developing, and delivering the course.

Keywords: Asia, course design, global librarianship, graduate program, online learning

INTRODUCTION

Many educators find teaching online challenging due to multiple reasons beyond content knowledge or expertise, such as preparation or training, technical support, and access to appropriate tools, applications, and resources. Nowadays, many higher education faculty members face the potential of moving their face-to-face courses online. The lucky ones find themselves working with instructional designers and technologists in getting their classes ready for delivery at a distance. However, some find themselves putting together the various course components on their own with help from their peers.

In early 2018, a university in the Philippines provided an opportunity to design a course for a cohort-based graduate program on library and information studies. Initially, the challenge focused on content knowledge, given the newness of the course. Also, the course design had to consider the instructor's location miles away from the university campus for three months during the academic term. The distance between the instructor and the students required the delivery of some course components online.

Students. The cohort-based program enrolled twelve graduate students comprising of eight fe males and four males. Also, the program recruited the students from member-organizations affiliat ed with the Association for Theological Education in Southeast Asia from several Association of Southeast Asian Nations (ASEAN) member countries (ATESEA, 2019). The cohort hailed from S outheast Asian countries of Indonesia (2), Myanmar (4), Philippines (4), Taiwan (1), and Thailand (1). All students worked in a librarian role or library context in their home countries before att ending graduate school at Central Philippine University as the host institution.

RESEARCH DESIGN & METHODS

The researcher presents this writing as a case study. Thomas and Myers (2015) define case studies as "analyses of persons, events, decisions, periods, projects, policies, institutions or other systems which are studied holistically by one or more methods" (p. 7). The case study is about a course designed for delivery at a distance with a cohort of Asian graduate students enrolled in a master's program in library and information studies.

Design. A case study is a research methodology commonly used in social sciences. As a research strategy and an empirical inquiry, the conduct of a case study allows the researcher to examine a phenomenon within its real-life context. Case studies involve descriptive and exploratory analysis of a person, group, or event towards a deeper understanding of the causes of underlying principles. Also, it could include quantitative evidence, relies on multiple sources of evidence, and benefit from the prior development of theoretical propositions (PressAcademia, 2018).

Elements considered for the study included demographic (gender and relevant information), experiences before, during, and after the course activities, and artifacts as products of students' work (blogs, reflection papers). Figure 1 identified the varied elements that the researcher accounted for in collecting data for the case. The narrative resulting from the data analysis would describe "the frequency with which it occurs, categorizes the information, and provides a numeric description of trends, attitudes, or opinions of a population by studying a sample of that population" (Acosta & Acosta, 2016, p. 2453).

Figure 1. Elements considered in the case study of a Global Librarianship course.

Research Questions. Given the newness of the course and delivery format, the researcher's interest focused on research questions (see below), providing answers to the challenges and lessons of designing the initial course in a blended delivery format. Also, the future of delivering courses at a distance seemed not so remote anymore, so the researcher would like to explore essential elements identified by the students given the initial course development work.

1. What were the challenges?
2. What are the lessons learned?
3. What course activities did the students find helpful?

Data collection. The researcher collected data to answer the questions utilizing various sources (e.g., blogs, reflection papers, etc.). After the coding, the data aligned with the items on challenges, lessons, and practical activities, the researcher performed a content analysis for emerging patterns and themes. Further, the researcher identified vital phrases and sentences to support the narrative in the findings.

RESULTS

The initial work done in creating the case study involved a review of the course website by identifying the content covered and format used for delivery. Then, the researcher collected student-generated artifacts from various course activities, face-to-face and online, and conducted a content analysis that coded for evidence of challenges and lessons from experience. Finally, the researcher mined the collected data for activities identified as helpful and supportive of student learning.

Course content. The course titled "Seminar on Global Librarianship" was one of the twelve courses required for graduate students to complete before taking the comprehensive exam and writing the thesis paper. From the syllabus, the course has four learning goals (Baylen, 2018):

- *Focuses on the role of information in society, and the methods of its acquisition, processing, retrieval, and dissemination across national boundaries by means of international library cooperation through the formulation and development of common standards, policies, and*

practices.

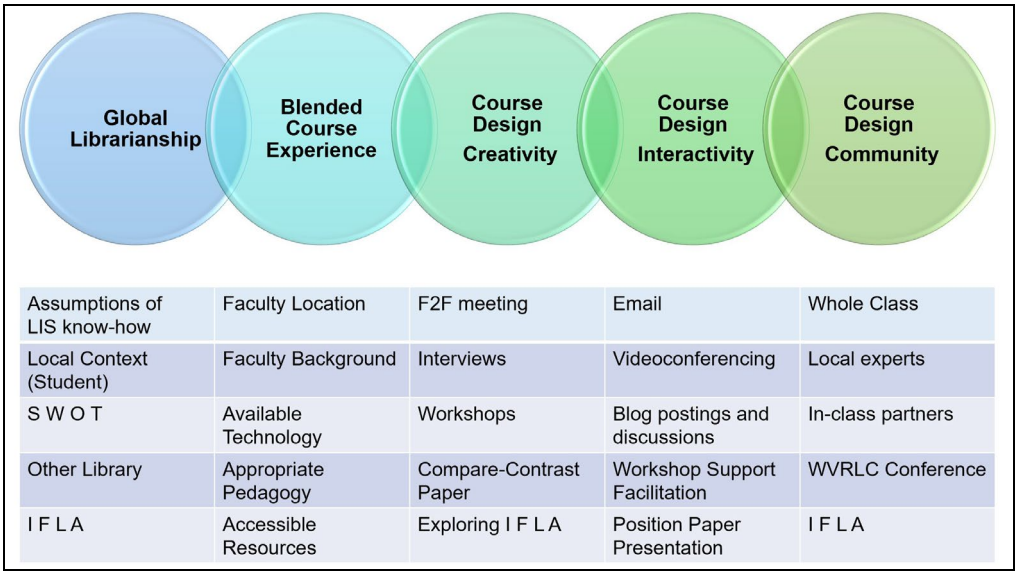
- *Studies library systems within the context of geographical areas, regions, or individual countries to improve libraries and library services throughout the world.*
- *Surveys the information systems, services, and practices of foreign libraries by placing them within various socio-economic, educational, and challenges given cultural contexts.*
- *Addresses the investigation of fundamental concepts concerning international communication and cooperation in library and information science as a global profession through the study of international professional organizations and associations, international programs, inter-governmental and non-governmental agencies in the information field that are working together to achieve library development worldwide.*
- *Highlights national differences in library and information science philosophy, objectives, practices, and policies as well as local endeavors that led to the growth of librarianship in its global dimensions in the past decade.* (n. p.)

Course Format. Given the students' location, the instructor decided to provide a blended learning experience (Khlaisang, & Songkram, 2019; Ustun & Tracey, 2020) involving both face-to-face and online lessons. The students had a face-to-face experience when the instructor taught at the university campus. Online experiences took place when the instructor returned to his country of origin.

The course design framed the blended learning experience using three core elements: Creativity, Interactivity, and Sense of community (see Figure 2). The course demonstrated creativity in its design by integrating authentic learning experiences at the students' location (Khan, Egbue, Palkie, & Madden, 2017). Examples of student-directed activities included the conduct of SWOT analysis of libraries in their respective countries or contexts. Sammut-Bonnici & Galea (2015) described SWOT analysis as a strategy of generating data on the strengths and weaknesses of an organization, and the opportunities and threats emanating from external sources. From the SWOT analysis, students develop proposals that introduce library programs that support global librarianship activities at their home organizations. The instructor also took advantage of the online availability and accessibility to IFLA conference events and asked students to participate, lurk, and observe patterns and themes generated by the live-streamed sessions, abstracts, and discussions.

For integrating interactivity in the course design, the course created online opportunities for instructor-student interactions (Purarjomandlangrudi, Chen, & Nguyen, 2016; Cho & Tobias, 2016) through discussions (Soffer & Cohen, 2019) and videoconferencing-based meetings (Khlaisang & Mingsiritham, 2016). Interactivity also took place as students, working in pairs, conducted interviews with local experts, that later generated a comparative paper about organizational and administrative contexts.

Figure 2. A Framework of the Blended Learning Experience.



Finally, the course experience provided an opportunity to build a sense of community (Lin & Gao, 2020; Phirangee, & Malec, 2017). The twelve graduate students came from faraway places (within the Philippines) or other Asian countries. At the university, the students had their community since they also enrolled and attended on-campus classes. The association of local librarians organized events for professional development that these students had limited access to. Getting the students to co-facilitate workshops with their instructor allowed them to experience the professional community beyond their cohort group and open connections to practicing librarians.

Challenges. There are several challenges identified in the designing, developing, and implementing the graduate course on global librarianship (Kuran, Pedersen, van Hattum-Janssen, & Paretta, 2018) using blended learning (Boelens, De Wever, & Voet, 2017). The researcher already identified the first two challenges, such as the first-time implementation of the course in content and delivery format. Except for a brief description, the course syllabus did not exist, and the instructor has to develop one before the start of the semester. In delivering a blended learning format, the university did not have an existing learning management system, forcing the instructor to access available applications to create an online course space.

Given the students' background, challenges manifested in limited technology literacy skills, especially in managing the online course activities (Kebritchi, Lipschuetz, & Santiague, 2017). All parties' common frustration involved the technology, specifically the Internet connection, during video conferencing sessions (Cloete, 2017). The instructor might have an excellent signal to a videoconference call. Still, the students did not or in an environment cluttered with unnecessary noises and disruptions (e.g., roster crowing, babies crying, etc.). The difference in time zones (12 hours) of instructor and student location added to the difficulty in getting a good connection between parties.

The command of the English language became a challenge with the expected demonstration of quality academic writing skills (Bolton, 2008). The instructor found a significant difference among students' writing in English, especially those who spoke and wrote more in their native language every day.

Lessons. Completing the content analysis of blog entries and reflection papers generated several lessons from three perspectives: Individual (Personal), Librarian (Professional), and Online learner. At the individual level, the students stated the following lessons learned from the course experience:

1. Acquired new knowledge.

    - *I love to read. but this is my first time* [reading] *the journal articles concerning … library professional*[s]. *IFLA website and IFLA journal attracted me because I got new ideas to promote my library services, new ways to connect with* [the] *library and society, and librarians* [worldwide].
    - *I have learned what happens in [the] global [scene] and how the people have connected [with each other].*
    - *I was given a chance to explore more in this field that leads to personal and professional development.*

2. Developed new skills.

    - [I] *trained me on how to cite articles in my papers and … how to make references correctly using APA format. This would be of good help since I am about to write my thesis next semester.*
    - *Develops my reading habit since I need to read articles given to me by my professor. In this course, reading is a must to complete the requirements.*
      Give[s] *me new ideas and makes me to love and enjoy learning this subject.*
    - *How to organize English Journals.*
    - [The] *practice of SWOT analysis.*

3. Appreciated the online learning experience.

    - *I think my* [most significant] *gain is … process of online learning this semester. Before the course, I only thought that online learning was "moving the learning process to the Internet."*

- *I have learned what E-learning has been since I experienced it. Although they often make me* [sleepless]*, every item in the course makes me feel interest*[ed]*, whether it is* [a] *project, exercise, blog, online face to face, protocols of writing, and APA form*[at].

4. Gained confidence with one's abilities.

    - *I learned that in order to be successful in life, we have to trust ourselves and be confident of the good things that we do. There are times* [when] *we fail, but failing is not the end … a challenge to do even better.*
    - *I have been learning to manage* [well] *my personal life at the same time with other subjects and nearly big final examination, comprehensive examination, thesis defense, and multiple assignments and presentations.*

5. Developed a disposition for lifelong learning.

    - *I learned to explore more, read more, write more, and think more outside of what I usually do.*
    - *Learning is endless, has no bound; it's lifelong learning. This course contributed a lot to my improvements personally, intellectually, and socially.*

6. Improve one's academic writing and communication skills.

    - *I was able to enrich my writing* [skills] *as I do my papers for blogs and projects. It is a good start for me to polish my writing skills since I will be working in an academic community.*
    - *I come from a country that doesn't use English as the* [primary] *language.* [We] *learn English only at school, and don't even practice it at all.* [It's] *because if you use English … then people will give* [you a distressed] *look. I have* [many] *shortcomings, but I continue to study in this class, and I get a lot of experience.*
    - *Today, librarians need to stand and connect with society, so I need to have* [excellent] *presentation skill*[s]*. The program proposal writing and twenty minutes presentation gave me valuable ideas to write an effective project proposal and an attractive presentation.*

From the perspective of one's role as a librarian, currently or in the future, the students described gaining new or reinforcing existing beliefs, locally or globally, and valuing collaboration with others as a practitioner:

1. Enhanced local perspective.

    - *Provides a chance to analyze our own library and to explore other libraries as well. I got* [many] *ideas from this course to think about,* [including] *my library and* [what] *things to do for* [a] *better future.*
    - *A librarian is an advocate. The job of a librarian is holistic, and sometimes it can be life-changing for someone.*

2. Gained a global perspective.

    - *My mind was* [open] *to* [witnessing] *what global librarianship* [is] *trying to help the community and the world.*
    - *I learned that this profession is not only local, but it is a global one.*
    - *I was able to make programs based on my context* [globally] *but connected that promotes lifelong learning and user-centered services.*
    - *I learn that this subject is related to my career because it enhance*[s] *me to think wide on the role of my work globally while acting locally.*

- *Before, I have no idea what is going on in global librarianship because my goal was just to focus on [my] own library. But, I learn that you cannot isolate yourself from the* [broader] *world of librarianship because you are a part of it.*
- *Since I have known IFLA, I have known that a group of librarians* [is] *changing from passive to active in the world.*

3. Appreciated the value of collaboration.

    - *Success is rather defined by the genuine connections and* [good] *relationships you build with your colleagues.*
    - *Cooperation is necessary within or outside the library. It is a way of building the network among librarians and other departments as well.*
    - *Money is not an issue today for me to participate and be involved in international conferences as long as I have my laptop and a good internet connection.*
    - *Collaboration among librarians is significant because there's value in working together in achieving the common goal.*

Finally, with two-thirds of the course activities delivered online, the students described two lessons learned as online learners focusing on increased awareness:

1. An introduction to learning at a distance.

    - *A taste, or should I say a mouthful of something* [that] *it's like to be virtual.*
    - *I learned to go out of the box and not to be tied up with traditional education. There's a lot of ways to learn and to share knowledge, especially in this digital age. Though I know that I am already left behind of using technology, I learned not to fear in exploring more.*
    - *A wonderful opportunity to discover ways in which libraries can collaborate with their communities and local organization[s] to support each other. The most interesting thing … librarians can* [work] *with each other online.*

2. Awareness of the challenges of online learning.

    - *I learned that online education is more of an output-based* [knowledge]. [My] *experiences making my outputs were not that easy since I need to comprehend what my professor is trying to tell me in his instructions.*
    - [I] *learned the importance of proper communication.*

Activities. Students shared anecdotes identifying activities that made a difference in their course participation (Khan, Egbue, Palkie, & Madden, 2017). The events that the students found helpful included online discussions, workshop facilitation with the instructor, exploration of an online (IFLA conference), and planning for educational programs aligned with global librarianship.

Using weebly.com as the application that hosted the course website, students described the convenience of finding all course materials, from electronic copies of readings to links of relevant websites, to support their learning experience. Also, the site included the class directory, course policies, and blog.

Also, students described the value of the blog space serving as a discussion board to communicate with each other on essential course topics (see Table 1) as well as a means to encourage and facilitate peer-to-peer interactions. The process to engage students to communicate as part of the blog discussion started a prompt from the instructor. Students responded to the prompt question and then replied to several peers. Most times, the engagement took place after students posted replies to each other.

Students referred to their participation and experience in assisting the instructor in delivering three workshops to the local librarians' association as one of the highlights of their course experience. Several students wrote in their reflection papers how the experience made a difference in their thinking about management, organization, and collaboration:

- *I felt excitement, but I thought twice about what* [we] *are going to do and how* [we] *are doing to deal with it because we will be facing professional librarians.*
- *I learned that being organized in every detail helps us to do the work easier. Being organized and systematic are virtues we need in the field of librarianship or even in our daily living.*
- *I learned how to be a good facilitator.* [I] *also gained many ideas from my professor, such as* [running] *the program effectively though any problems occur. I learned to be a problem solver.*
- *I learned that collaboration is a good way to complete the task that is given to us successfully and effectively because all activity is as a peer work they were helping each other.*
- *I learned how to become flexible and adapt to what is at hand---changing some plans tested my flexibility and adaptability* [to] *the situation.*

Table 1. Example of a Blog Entry Prompt and List of Topics to Facilitate Student Discussion

- Entry #1 So you want to be a global librarian?
- Entry #2 Challenges to Global Librarianship
- Entry #3 Exploring qualitative data analysis
- Entry #4 Exploring initiatives, actions, and activities
- Entry #5 Gathering ideas from the IFLA conference program
- Entry #6 Searching ideas for integrating global librarianship in your library
- Entry #7 All good things "must" ….

Most students have limited resources to participate in an international professional event such as the International Federation of Library Association (IFLA) conference held in Kuala Lumpur (Malaysia) in 2018. Fortunately, access to several featured sessions live-streamed online made it possible for students to listen to current issues and trends impacting the librarian's role and the profession.

At the end of the course, the students presented program proposals on global librarianship that could be implemented when they return to their organizations. Initially, students worked in pairs in planning their programs. Having a partner provided support to a challenging assignment that asked students to pull together the ideas learned from the course. For the final task, the students created presentations using PowerPoint focusing on plans for promoting global librarianship and delivered before the instructor and peers.

CONCLUSION

Designing a new course and delivering it at a distance for the first time had its challenges and lessons for both instructors and students, as presented in this case study. However, the experience opened a door that would never close for the academic program and the university to pursue similar future endeavors. The ability to deliver a course online or in a blended learning format could create expanded outreach, accessibility, and diversity activities. Distance education initiatives could benefit those limited by geographical location, language, and resources. In retrospect, this case study of the course on global librarianship is the beginning of another journey that "provides an opportunity to see things differently, hear things loudly, and speak of things passionately" (Asi, 2018).

REFERENCES

Acosta, I. C., & Acosta, A. S. (2016). Teachers' perceptions on senior high school readiness of higher education institutions in the Philippine. *Universal Journal of Educational Research, 4*(10), 2447-2462. DOI: 10.13189/ujer.2016.041024

Asi, A. L. (2018). *Assessment of student learning*. Unpublished manuscript. Iloilo City, Philippines.

Association for Theological Education in Southeast Asia. (2019). *12 scholars graduate from master in library and information science with specialization in theological librarianship*. http://atesea.net/recent-activites/12-scholars-graduate-from-master-in-library-and-information-science-with-specialization-in-theological-librarianship/

Baylen, D. M. (2018). *MLIS 624 Seminar in Global Librarianship* [Course Syllabus]. Iloilo City, Philippines: College of Education, Central Philippine University.

Boelens, R., De Wever, B., & Voet, M. (2017). Four key challenges to the design of blended learning: A systematic literature review. *Educational Research Review, 22*, 1-18.

Bolton, K. (2008). English in Asia, Asian Englishes, and the issue of proficiency. *English Today, 24*, 3-12 doi:10.1017/S026607840800014X

Cho, M-H., & Tobias, S. (2016). Should instructors require discussion in online courses? Effects of online discussion on community of inquiry, learner time, satisfaction, and achievement. *International Review of Research in Open and Distributed Learning, 17*(2), 123–140.

Cloete, A. L. (2017). Technology and education: Challenges and opportunities. *HTS Theological Studies, 73*(4). http://dx.doi.org/10.4102/hts.v73i4.4589

Kebritchi, M., Lipschuetz, A., & Santiague, L. (2017). Issues and challenges for teaching successful online courses in higher education: A literature review. Journal of Educational Technology Systems, 46(1), 4-29. https://doi.org/10.1177/0047239516661713

Khan, A., Egbue, O., Palkie, B., & Madden, J. (2017). Active learning: Engaging students to maximize learning in an online course. *Electronic Journal of e-Learning*, *15*(2), 107-115.

Khlaisang, J., & Mingsiritham, K. (2016). Engaging virtual learning environment system to enhance communication and collaboration skills among ASEAN higher education learners. *International Journal of Emerging Technologies in Learning, 11*(4).

Khlaisang, J., & Songkram, N. (2019). Designing a virtual learning environment system for teaching twenty-first century skills to higher education students in ASEAN. *Tech Know Learn, 24,* 41–63. https://doi.org/10.1007/s10758-017-9310-7

Kuran, M. S., Pedersen, J. M., van Hattum-Janssen, N., & Paretta, J. S. (2018). Opportunities and challenges in designing a blended international student project activity: Experiences from the EPIC Project. *2018 17th International Conference on Information Technology Based Higher Education and Training* (ITHET). DOI: 10.1109/ITHET.2018.8424770

Lee, J., & Martin L. (2017). Investigating students' perceptions of motivating factors of online class discussions. *International Review of Research in Open and Distributed Learning, 18*(5), 148–172.

Lin, X., & Gao, L. (2020). Students' sense of community and perspectives of taking synchronous and asynchronous online courses. *Asian Journal of Distance Education, 15*(1).

PressAcademia. (2018). *Definition of a case study*. https://www.pressacademia.org/definition-of-case-study/

Phirangee, K., & Malec, A. (2017). Othering in online learning: An examination of social presence, identity, and sense of community. *Distance Education, 38*(2), 160-172. https://doi.org/10.1080/01587919.2017.1322457

Purarjomandlangrudi, A., Chen, D., & Nguyen, A. (2016). Investigating the drivers of student interaction and engagement in online courses: A study of state-of-the-art. *Informatics in Education - An International Journal, 15*(2), 269-286.

Sammut-Bonnici, T., & Galea, D. (2015). SWOT analysis. *Strategic Management, 12*. https://doi.org/10.1002/9781118785317.weom120103

Soffer, T., & Cohen, A. (2019). Students' engagement characteristics predict success and completion of online courses. *Journal of Computer Assisted Learning, 35*(3), 378-389. https://doi.org/10.1111/jcal.12340

Thomas, G., & Myers, K. (2015). *The anatomy of the case study*. London: SAGE Publications, Ltd.

Ustun, A. B., & Tracey, M. W. (2020). An effective way of designing blended learning: A three phase design-based research approach. *Education and Information Technologies*, *25*, 1529–1552. https://doi.org/10.1007/s10639-019-09999-9

A Study on the influence of Adaptive Learning support system on lesson design and practice of elementary school teachers

Wakio OYANAGI
oyanagi@kansai-u.ac.jp
Professor
Kansai University
Takatsuki-shi, OSAKA, JAPAN

The purpose of this study is to clarify how adaptive learning environment with AI diagnosis are used during a given lesson by students and teachers, and to clarify how their use leads to learning outcomes. Adaptive learning is often associated with e-learning. There have been a few studies on the learning effect of adaptive learning in K-8 Education (Smith 2018). There were few studies on adaptive learning that explored how teachers make use of the results of learning diagnosis using AI in their lessons. Forty-three elementary schools in City A participated in this project for three years using the adaptive learning system developed by Dai Nippon Printing Co., Ltd. We calculated the average of deviation value and the average of latent rank value for the year using the test score results, and the score for the year based on the pupil questionnaires about the city's program for three years. As a result, it was found that schools that were successful in using this system were doing the following five things. 1) Utilizing the information of this system in the analysis of examples and teaching materials taken in the class, 2) Visualizing the thinking process in the child and making it correspond to the result returned by the system, 3) Make time for the child to read and understand the recommending information to the child returned by the system in class, 4) Make use of individual child's learning style in teaching, 5) Use information of this system when discussing with parents.

Key words: Adaptive Learning, Mathematics Education, Teacher Professional Development

INTRODUCTION

Adaptive learning is often associated with e-learning. It is a learning environment that uses ICT to facilitate comprehension and retention based on the unique needs of the learner. Adaptive learning system is unique when it comes to the level of detail and design. It tends to be constructed from three components, such as "Content" ," Learner", and "Instructional Method". Practical research and development on adaptive learning system have been conducted in higher education (Dziuban, Howlin, Moskal, Johnson, Parker, & Campbell 2018). The research on adaptive learning is often understood as an extension of CAI research based on behaviorism. The recent adaptive learning system have been linked with the personalized learning approach by utilizing big data and AI. It has been able to adapt to the preference and learning style of the learner. Adaptive learning systems have become able to help learners take ownership of their learning (Nuri & Nese 2013).

There have been a few studies on the learning effect of adaptive learning in K-8 Education (Smith 2018). There were few studies on adaptive learning that explored how teachers make use of the results of learning diagnosis using AI in their lessons.

The research question is " how the assessment and evaluation information system utilizing AI can be utilized in the lesson by teachers of primary school".

The purpose of this study is to clarify how adaptive learning environment with AI diagnosis are used during a given lesson by students and teachers, and to clarify how their use leads to learning

outcomes. It will report how the kind of guidance and learning environment that should be prepared in order for the learner to consider the diagnosis information and engage in self-directed learning, In addition, this study will also clarify the necessary components for the teacher's team to acquire the assessment literacies.

RESEARCH DESIGN & METHODS

This research pays attention to analyze the mathematics learning of students and utilize that information to improve teaching. Many local governments and schools participate in this research. This research is part of the joint research with Dai Nippon Printing Co., Ltd. This presentation reports the results of the collaborative research with City A. We have been studying for two years starting operation evaluation after spending one year as preparatory period.

Regarding the research method, information was collected and analyzed in two ways in connection with the operation evaluation of this system.

Firstly, we gather and analyze the relationship between each student’s unit mathematics test results and the result of the term end test for the same subject for 2 years as a direct assessment way. Secondary, we analyze the following three information collected by questionnaires as an indirect way. 1) Students' opinions on the utilization of recommendation sheets and evaluation comments, 2) the opinions of teachers concerning the operation of this system, and 3) teachers' opinions on the professional learning program.

City A introduced a system of adaptive learning support for fourth grade in three schools on a trial basis in the academic year 2016 and subsequently began to use the system for all students in the city from fourth to sixth grades from September 2017 (2,700 students each in fourth, fifth, and sixth grades). This action focused on how a system of adaptive learning support could be used to raise the assessment literacies of teachers and foster the ability of students to learn by themselves.

Based on data generated after three years of implementation, this study intends to clarify both the potential and problematic issues related to how the system is being utilized by teachers in schools and the reception of the system by schools.

In addition, raising the skills of the teachers was an urgent issue for City A, where an increasing number of teachers are relatively inexperienced. Therefore, the city A try to provide an environment that allows young teachers to utilize data to grasp the condition of the classes in which they teach and encourage mutual learning between teachers in different year groups and at different schools. Further, the study aims to clarify effective professional learning contents and methods in achieving this objective.

Following is a description of the contents and attributes of the system to support the activities of children and teachers.

First, the children take a unit test, which is developed to assess the extent to which they have met the targets for the unit. The test comprises ten sections: 1) six sections with basic standard questions based on the government's curriculum guidelines, requiring mastery of the topic learnt; 2) two sections designed to foster good judgment, in which textbook questions that are not clear or where lack of attention could lead to incorrect answers are highlighted, and proper interpretive skills are instilled; and 3) two sections based on materials associated with the topics learnt and designed to stimulate thinking skills, centering on questions requiring problem-solving abilities rather than just knowledge. The end-of-semester test comprises twenty sections. These include twelve sections with questions based on standard learning abilities, four with judgment-based questions, and four with questions that require thinking skills.

After completion, the test papers are scanned using a system installed at the school and are marked automatically. The relevant data are transmitted to a cloud server over a network. The data are analyzed by an AI-based device, not only to identity questions that have been answered incorrectly but also to highlight the level of the pupils' understanding related to questions answered correctly.

After understanding each pupil's level of learning, they are given a "recommend sheet" (revision and practice worksheet with individually targeted questions) that is suited to their level of understanding and the areas that they find difficult and a "comment sheet" with words of encouragement to make them aware of their challenges.

The teacher receives a record card related to the learning of each child containing the information as followings . 1) information on whether the pupil has answered each question correctly/incorrectly or failed to answer; 2) the average number of correct answers for pupils for each question, while considering the class as a unit; 3) the average number of correct answers for each viewpoint; 4) a table showing which "recommend sheets" the child has received; and 5) the distribution of pupils' ability ranking (based on latent rank theory). The latent rank theory identifies the pupil's ability and potential by assigning a grade based on the analysis of question difficulty and response trends and calculating the probability of the pupil being assigned each grade.

The individual record card has the results of all the unit tests, the end-of-semester tests, and relevant analysis, and is thus a comprehensive source of information regarding each child's learning process and its characteristics.

RESULTS

We calculated the average of deviation value and the average of latent rank value for the year using the test score results, and the score for the year based on the pupil questionnaires about the city's program. For the three values, we subtracted the value in the fourth grade from that in the sixth grade for each pupil. The table 1 shows the change in the value.

Using the names (School 1, School 2,) assigned according to change in deviation value, the schools were rearranged in descending order from positive to negative. The results are shown in the table 1.

School 1 ranks highest in terms of both deviation value and latent rank change ratios. However, in terms of change in the pupils' questionnaire scores, the school is at the twentieth position. These results indicate that the school has a large number of pupils whose abilities improved or who were naturally able. It could also be interpreted that the results indicate that the school has several pupils who do not have a positive opinion about the city's program.

As mentioned above, our focus in this study is as follows: 1) actual increase in test results and transformation in the behavior of the pupils, inculcating a positive attitude toward the program (positive transformation of awareness), and identification of schools that meet both these criteria; 2) division of the forty-three schools into three categories (fourteen upper, fourteen mid-ranked, and fifteen lower) and identification of schools in each category that have introduced interesting initiatives related to the three values. Therefore, to fulfill the objectives of the study, we have elaborated on the initiatives implemented by the schools highlighted in yellow in the table 1.

Out of the forty-three schools, School 9 features in the upper category for changes seen in all three values. School 14 is the lowest of the middle-ranked schools in terms of changes in latent rank value, but it is in the upper category for change in the other values. In other words, the school's latent rank is not high, though with the efforts of staff and pupils, the test scores have risen, and this is considered as a positive outcome by the pupils. School 19 ranks the middle in terms of change in deviation and latent rank values and ranks sixth in the upper category in terms of change in pupils' perceptions regarding the program, indicating that the school has been actively educating pupils about the benefits. School 35 has poor results in terms of the change in deviation value and is in the lower category. However, it is ranked in the middle in terms of change in latent rank and in the pupils' perceptions of the program. Therefore, it

Table 1 The order of schools that show good results and good evaluation

Deviation value rank	Latent value rank	Survey response ranking
School1	School3	School29
School2	School1	School10
School3	School2	School14
School4	School6	School20
School5	School29	School24
School6	School9	School19
School7	School4	School9
School8	School21	School15
School9	School7	School38
School10	School15	School8
School11	School8	School21
School12	School5	School3
School13	School16	School28
School14	School30	School5
School15	School10	School18
School16	School24	School22
School17	School12	School34
School18	School32	School12
School19	School33	School16
School20	School18	School1
School21	School19	School40
School22	School25	School13
School23	School17	School11
School24	School13	School31
School25	School26	School41
School26	School35	School35
School27	School22	School32
School28	School14	School39
School29	School27	School4
School30	School23	School36
School31	School31	School2
School32	School39	School42
School33	School28	School25
School34	School20	School17
School35	School40	School6
School36	School36	School27
School37	School11	School23
School38	School18	School37
School39	School34	School26
School40	School41	School33
School41	School37	School43
School42	School42	School7
School43	School43	School30

has been identified as a school where the program could have an impact in the future.

Finally, School 25, which was identified based on a slightly different criteria, is ranked in the middle in terms of change in deviation and latent rank values. Simultaneously, the changes in the pupils' perceptions of the program are also in the lower category, which implies that the program has not been received positively at the school.

We decided to include this school in the focus list as the information garnered could be helpful for other schools in the same category to determine if this perception is based on the initiatives in these schools and the efforts that are being made to address this issue.

FINDINGS and DISCUSSION

In School 9, two initiatives were identified through teacher interviews. The first notable initiative developed at the school was the analysis of test questions by the whole teaching body to ascertain the abilities required for each unit, and the utilization of that information for developing teaching methodologies and strategies. The main aim of this analysis was not to teach pupils the test strategies but to enable teachers to create questions that test the abilities required for the unit. The information was also utilized while questioning the students and creating the teaching material. It was also observed that teacher training was conducted across the school to support this initiative. The second notable initiative was the importance placed on making the children visualize their thought process. Teachers tried to teach the children to take careful notes and think pictorially, and attempted to utilize these processes while conducting lessons based on individual optimization and in the development and utilization of relevant teaching resources. It was found that such efforts boosted latent rank value, in particular, for children at all levels.

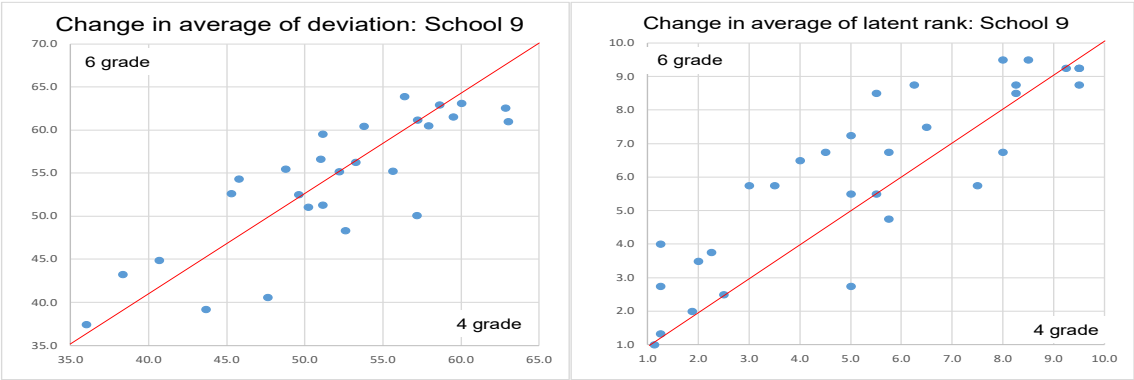


Figure 1 Changes in children's learning status in School 9

In School 14, two relevant initiatives were also identified through teacher interviews. The first was the definite use of the individual record card while planning lessons. For children whose abilities the teachers were concerned about, they carefully referred to information on the record card and used

individualized methods based on the data to dispel the child's fear of mathematics, raise awareness about their issues, and to enhance their confidence. The second initiative was that pupils were given time during lessons to work on their individual "recommend sheets" (with revision questions covering areas of difficulty for each individual child). The school encouraged children to independently review the learning process, ensuring that they first have time to tackle their "recommend sheets" on their own and to work with other children on questions that they do not understand, before allowing them to read the comments. Another helpful "trick" was displaying the concepts that they had learnt previously, prominently within the classroom. The children could refer to these at any time and could hence avoid the mistakes that were likely to arise based on these concepts.

A fourth and fifth grade teacher was interviewed and the data collected for the class indicated a rise in deviation value for children with low academic performance and an overall rise in latent rank value.

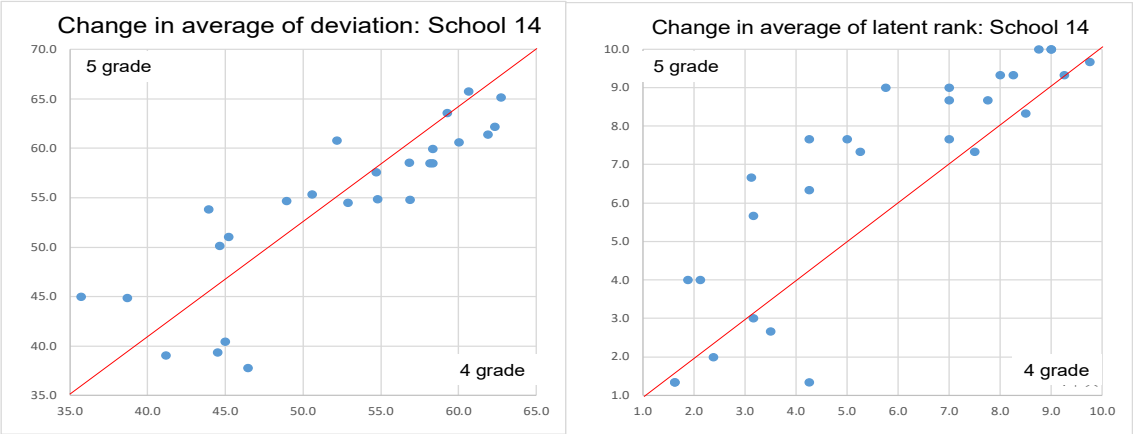


Figure 2 Changes in children's learning status in School 14

eIn School 19, two relevant initiatives were also identified through teacher interviews. The first was the emphasis on creating learning habits and the conscious creation of a culture of learning within the class. The school decided to share details regarding the program with the children and made them aware of the reason for, and significance of, using "recommend sheets" in class and in independent study, as

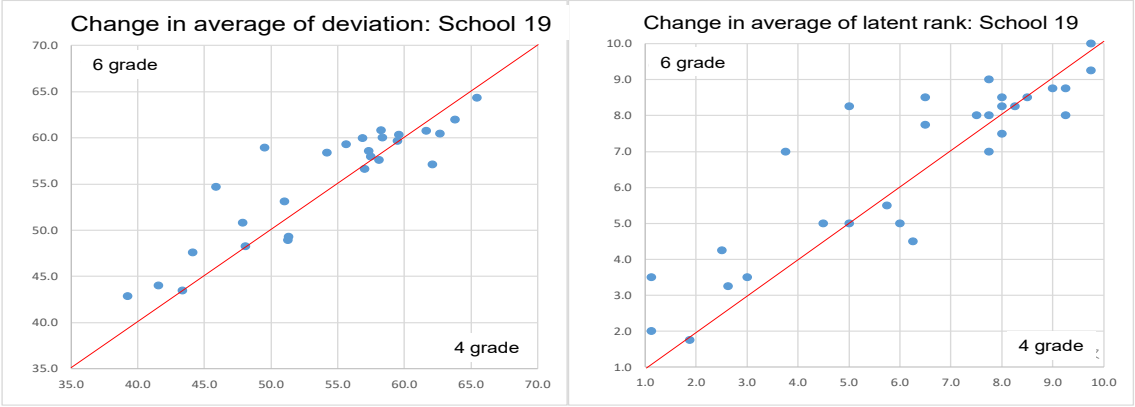


Figure 3 Changes in children's learning status in School 19

well as the fact that utilizing the city's system would help them understand their "own current strengths and weaknesses." The second initiative was ascertaining the support that would be effective for each child and for children who faced similar issues. Based on this information, the teachers support was classified and systematized attempts were made for continuous improvement.

It was found that these initiatives boosted the overall deviation value and there was a significant rise in the latent rank value of pupils in the middle and lower categories.

In School 35, two relevant characteristic initiatives were identified through teacher interviews. The first was ascertaining each pupil's learning style, thereby resulting in an improvement in the quality of teaching. Teachers took into consideration that optimization is not limited to individual learning. During teaching sessions, while using "recommend sheets," they allowed pupils to choose whether to work in pairs and groups or to work on their own. Pupils with lower abilities, in particular, found it daunting to tackle the "recommend sheets" on their own, even though they had the targeted practice questions. The attitude and behavior of the students indicated the effectiveness of working together and encouraging each other, and it was identified that this had a positive impact on teaching. The second initiative was educational guidance that consciously involves metacognition to encourage monitoring of one's own issues and of barriers to continued learning and promotes awareness of how to adapt one's own behavior to improve the situation.

gSlight change in deviation value and latent rank value could be seen for the higher and lower-ranked pupils, while minimal changes were reflected in the middle level pupils. However, based on the results of the questionnaire for the class, it is evident that as the semester progresses, the pupils are more engaged in learning, implying that there is potential for positive improvement in future.

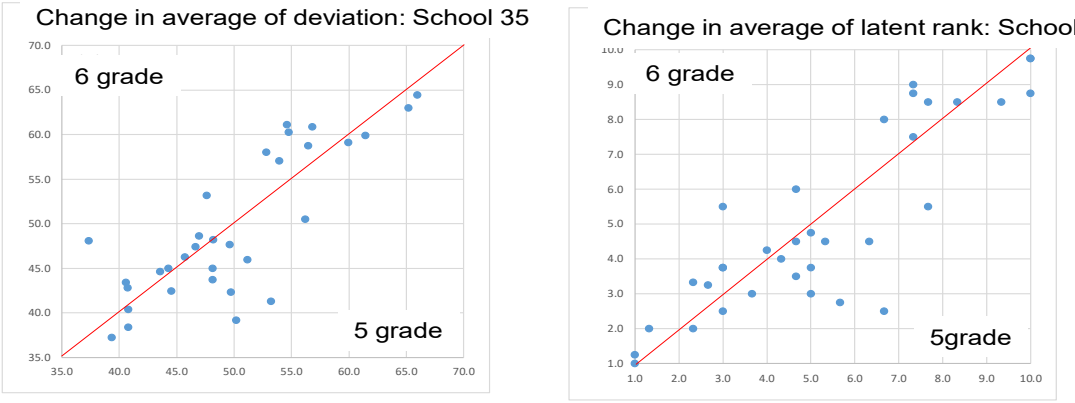


Figure 4 Changes in children's learning status in School 35

In Elementary School 25, two relevant initiatives were identified through teacher interviews. The first was that emphasis was laid on "securing and improving the areas where the pupils are strong," using data from the record cards to maximize the impact. The second was the analysis of the connection between the pupil's latent rank for each unit and the awareness of the parent or caregiver. Teachers

believe that there is a connection between the anxiety about a particular unit with a certain latent rank and the unease felt by the parent or caregiver related to the unit. They attempted to analyze the connection between the two and tried to eliminate the miscommunication, between the pupil and the caregiver with regard to unease and relevant initiatives. For example, a caregivers feelings about tests can make it hard for pupils to look at their test scores, identify the answers that were incorrect, and address the relevant issues. To address this, an attempt has to be made to change the attitude toward tests on the part of both, the pupil and the caregiver. It was found that long-term persuasive initiatives have been carried out to address this. Overall, a change in the deviation value and the latent rank value can be seen. It was also identified that the perception of the students regarding the program was not very positive as it takes time sto educate them on about the significance of the tests and "recommend sheets" in teaching.

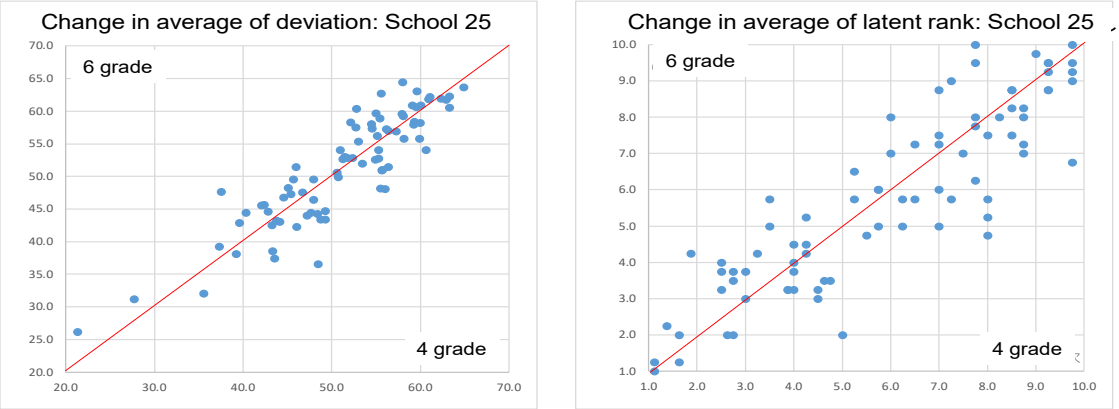


Figure 5 Changes in children's learning status in School 25

As a result, it was found that schools that were successful in using this system were doing the following five things. 1) Utilizing the information of this system in the analysis of examples and teaching materials taken in the class, 2) Visualizing the thinking process in the child and making it correspond to the result returned by the system, 3) Make time for the child to read and understand the recommending information to the child returned by the system in class, 4) Make use of individual child's learning style in teaching, 5) Use information of this system when discussing with parents.

REFERENCES

Dziuban, C., Howlin, C., Moskal, P., Johnson, C., Parker, L., & Campbell, M. (2018). Adaptive learning: A stabilizing influence across disciplines and universities. Online Learning, 22(3), 7-39.

Hariyanto, D., Triyono, M. B., & Köhler, T. (2020). Usability evaluation of personalized adaptive e-learning system using USE questionnaire. *Knowledge Management & E-Learning*, 12(1): 85–105.

Nuri, K.,& Nese, S.(2013). Adaptive Learning Systems: Beyond Teaching Machines. *Contemporary Educational Technology*, 4(2): 108-120.

Smith, K. (2018).Perceptions of Preservice Teachers about Adaptive Learning Programs in K-8 Mathematics Education. Contemporary Educational Technology, 9(2): 111-130.

The study on feasibility and potential demand of the application of excellent courses in teaching and research

Lin Sihong
15915527007@163c.com
Master Course Student
South China Normal University
Guangzhou, China

Chen ShuFang
1435180113@qq.com
Master Course Student
South China Normal University
Guangzhou, China

Wang YuZhen
1692610240@qq.com
Master Course Student
South China Normal University
Guangzhou, China

The activity of "A Teacher an Optimal Lesson" is an important starting point for the overall promotion of China's education informatization. It aims to promote the popularization and sharing of high-quality educational resources with application as the guidance, resources as the link, and teachers' classroom application as the center. Since 2014, a large number of high-quality resources have been accumulated. In order to promote the further application of excellent courses, the Ministry of education has carried out various forms of teaching and research activities around the "deep integration of information technology and classroom teaching".
This study explores the feasibility and potential demand of the application of excellent courses in teaching and research by means of interview and questionnaire survey. Based on the grounded theory, NVivo qualitative analysis software was used to conduct three-level coding analysis of the interview content. Combined with questionnaire data analysis and three-level coding analysis, the research finds that: (1) although the excellent course activities have achieved certain results, the quality is uneven, and it needs to carry out content reorganization and redesign. (2) The teaching and research courses based on excellent courses should implement the concept of the new curriculum standard and highlight the cultivation of the core quality of the discipline; (3) the teaching and research courses based on excellent courses need certain supporting resources, platforms and evaluation after teaching and research.

Key words: Excellent course, teaching and research,Feasibility and demand

INTRODUCTION

1.Research background

"A Teacher an Optimal Lesson" (hereinafter referred to as "excellent class") is an important starting point for the overall promotion of education informatization. It aims to promote the popularization and sharing of high-quality educational resources with application as the guidance, resources as the link, and teachers' classroom application as the center.

In order to promote the further application of excellent courses, the Ministry of education has carried out various forms of teaching and research activities around the "deep integration of information technology and classroom teaching". Since 2017, Guangdong Provincial Education and technology center has also adopted the method of applying by local governments and developing teams by the undertaking units to construct the column of "excellent course teaching and research section". As of 2019, a total of 28 programs have been produced. In addition, the "excellent class Decoding" project carried out in Tianhe District of Guangzhou not only solves the generation problem of "excellent class" by reconstructing the heterogeneous process of the same class, but also gives full play to the role of "excellent class" through the "excellent class" and "decoding", so that the front-line teachers can basically upgrade from low-level listening (understanding) to high-level evaluation (analysis, evaluation) and open class (creation)) 。 The above activities or projects can promote the normal application and in-depth promotion of excellent courses to a certain extent, and help front-line teachers make better use of information technology to carry out education and teaching activities. Meanwhile, it shows that the teaching and research forms are changing gradually under the Internet environment. "Internet plus" technology has brought new opportunities to break the traditional teaching and research problems such as limited time and space, insufficient resources and obsolete content.

Therefore, the "13th Five-Year plan" of national education development[1] pointed out: "promoting the development of" Internet plus education "and strengthening the exploration and popularization of new teaching and research models. Under this background, the integration of organizational forms and technical means in teaching and research activities is studied. It has also gradually attracted attention, and can be sorted out as three research trends: teaching and research mode innovation, technology integration and adaptation, and practice research. For example, Zheng Shizhong[2] and others think that the new teaching and research mode can be mainly organized through mixed teaching and research, empirical teaching and research, and cooperative teaching and research. Zhang Xiaohong et al.[3] proposed hierarchical linkage teaching and research, combined with Internet technology to realize the "same class heterogeneous" linkage development of teachers at all levels.

Driven by the new innovation mechanism, it integrates with the new technology in the information age, and analyzes the teaching and research behavior based on data-driven, and finally completes the research with the help of teachers, realizing the transformation from "teaching" to "learning" [4]. For example, Wang YONGGU et al. [5] extracted digital portrait model based on big data driven research paradigm and generated corresponding intervention strategies. In addition, Haiyan senior high school in Jiaxing City, Zhejiang Province, has constructed a "three-dimensional practice paradigm of" one teacher, one excellent class "based on school-based curriculum resources to improve the level of school-based teaching and research and research development from three dimensions of classroom grinding, theme forum and scientific research writing [6]. Yichang city of Hubei Province also promotes the combination of excellent courses and school-based teaching and research from the perspective of regional teaching and research, which shows that the application of excellent courses in practical teaching and research under the Internet environment has certain research significance.

To sum up, the popularization and application of excellent courses has achieved certain results. Under the trend of network teaching and research, the application of excellent courses in teaching and research is getting preliminary promotion. However, at present, there is a widespread phenomenon of "emphasis on sunshine and light on use" in excellent class activities[7], which pays less attention to the needs of teachers, and fails to seek the feasibility of teaching and research of excellent courses from the current situation. With the development of information technology and teaching curriculum reform, teaching and research innovation should be gradually paid attention to. Therefore, according to the current situation of application teaching and research of excellent courses in Guangdong Province, this study will analyze and summarize the feasibility and various needs of application teaching and research of excellent courses, and tap the development potential of application teaching and research of excellent courses.

2.Definition of theoretical concept

iExcellent course

Since 2014, The Ministry of education has continued to organize and carry out the "one teacher, one excellent class, one teacher" activity for all primary and secondary school teachers who have network and multimedia teaching conditions. It involves the main subjects of primary and secondary schools all over the country. The sample size is huge, and a large number of high-quality teaching resources are produced. Through this kind of high-quality resources co construction and innovation mode, all front-line teachers in the country are fully mobilized The enthusiasm and creativity of applying information technology in subject teaching will further enhance teachers' awareness of the importance of information technology in promoting teaching reform and improving teaching quality [8]. The implementation of the activity mainly includes two stages: Teachers' online "drying class" and "excellent class" selection. The national, provincial, prefecture (city), county (District) educational administrative agencies and schools organize class observation and evaluation, and jointly Polish high-quality class cases, and upload each participating teacher's "excellent class" to the national education resources public service platform, On the other hand, teachers, teaching researchers and other educators can obtain teaching experience through "excellent class", which can provide typical demonstration for teachers to apply information technology in teaching, and realize the virtuous circle and co construction and sharing of resources.

iiCharacteristics of teaching and research of excellent courses

In the network information environment, excellent course resources with high quality and rich characteristics provide teachers with new teaching thinking. Since 2014, a large number of high-quality resources have been accumulated. As of June 2020, the total number of teaching materials has reached more than 2007 million, covering nearly 80% of the knowledge nodes of the main National Curriculum textbooks in primary, junior and senior high schools. By observing the rich high-quality lesson cases and related resources, and comparing the gap between themselves and famous teachers, teachers reflect and inspire teaching wisdom, and drive teaching practice with high-quality teaching objectives [9]. Meanwhile, relying on the information platform such as network platform, we should build a teacher's teaching and research community, break the limitation of traditional face-to-face, fit the trend of "Internet plus teaching and research", and realize professional development in communication.

RESEARCH DESIGN & METHODS

1.Research methods

Through questionnaire survey and semi-structured interview, this paper investigates various roles of teachers, teaching researchers, etc., to understand the views of teachers and researchers on the teaching and research of excellent courses, analyze the interview content according to grounded theory, form codes, and then draw conclusions.

2.Research object

In order to compare the teaching and research situation of excellent courses between developed and underdeveloped areas in Guangdong Province, 383 people were randomly selected and surveyed, covering many cities in Guangdong Province. The research identities of the respondents included 8% of teaching and research staff, 37.9% of primary and secondary school teachers, 2.1% of university teachers, 11.7% of undergraduate normal students, 44.4% of postgraduate students, 1.3% of doctoral students and 1.8% of others. As shown in Table 1.

Table 1 Research identity of respondents

identity	proportion
Teaching and research staff	8.0%
Primary and secondary school teachers	37.9%
University Teachers	2.1%
Undergraduate Student	11.7%
Master Course Student	44.4%
Doctoral Course Student	1.3%
Others	1.8%
Total	

Besides,Through interviews with 15 educational researchers, we obtain objective and real sample data Basic principles and methods, three-level coding of raw materials, on this basis, analysis of teaching and research micro courses and platform construction requirements based on excellent course.
The interview activity mainly adopts the form of telephone interview. Before the interview, the main research content of this study was briefly introduced to all the interviewees, so that the interviewees had a preliminary understanding of the construction of teaching and research micro courses and platform based on excellent courses, so as to better clarify their personal situation, so as to ensure the effectiveness of the interview results.

Data-analysis

1.Feasibility analysis on teaching and research of excellent courses

In the analysis of the current situation of the application of excellent course teaching and research, as shown in Table 2, most people are "relatively familiar" or "a little familiar" with the excellent course, which indicates that the respondents are basically familiar with the excellent course in teaching related majors. At the same time, most teaching researchers and primary and secondary school teachers are "relatively" or "very" familiar with the excellent course, indicating that teaching workers or researchers have a certain concern for the excellent course Degree.
In view of the current lack of teaching and research, there is no significant difference in the proportion of respondents with different teaching and research status and different familiarity with excellent courses. First of all, all teachers and researchers think that teachers' teaching research is "lack of personalized teaching and research design". At the same time, most of them also think that teachers' teaching research has "lack of high-quality lesson", "lack of interaction with experts" and "lack of effective platform support". Secondly, among the four groups of primary and secondary school teachers, university teachers, undergraduate normal students and graduate students, the most common view is "insufficient interaction with experts", accounting for 64.8%, 62.5%, 55.6% and 60% respectively. In addition, all doctoral students think that teachers' teaching and research is "lack of management mechanism and incentive system protection", and 60% of doctoral students think that teachers' teaching research is "lack of effective support of platform".
In view of the difficulties in the teaching and research of excellent courses, most of the respondents thought that "it is difficult to persist for a long time" and "lack of teaching and research feedback" are the main problems in the teaching and research of excellent courses, accounting for 58.5% and 58.7% respectively. On the whole, there are also high calls for solving the problems of "resources to be optimized", "insufficient interaction" and "lack of teaching and research evaluation and feedback".

Table 2 Familiarity with excellent courses

identity	Familiarity with excellent courses				
	Very	Pretty	A little	Not well	Not at all
Teaching and research staff	33.3%	33.3%	0	0	33.3%
Primary and secondary school teachers	13.1%	32.4%	32.4%	20%	2.1%
University Teachers	25%	25%	37.5%	12.5%	0
Undergraduate Student	2.2%	20%	26.7%	44.4%	6.7%
Master Course Student	5.3%	34.1%	30%	20.6%	10%
Doctoral Course Student	40%	40%	0	0	20%
Others	14.3%	0	14.3%	42.9%	28.6%

The problems found in the survey are consistent with some conclusions of literature research. However, despite the problems existing in teaching and research of teachers, 94.3% of the respondents still think it is necessary to carry out teaching and research by using excellent courses. Among them, the advantages of teachers' teaching research are "improving teachers' self reflection through observing and learning Excellent

Courses" and "excellent course resources are high-quality and rich, which can meet teachers' personalized needs 8% and 80. 1% respectively.

From the original interview text and coding results, as shown in Table 3, we found that the existing excellent course production technology is excellent, the teaching design is mainly student-oriented, and the integration with information technology in the classroom starts, and the interaction between teachers and students is relatively warm. At the same time, after a long accumulation of "one teacher, one excellent course" activity, the excellent course resources are relatively rich, covering the courses of various disciplines in different periods. It is pointed out that (n = 15) excellent teachers can promote their professional development. As the interviewee pointed out, the excellent class presents a real class, and it is beneficial for teachers to watch the excellent class to improve teaching.

Table 3 Material information of spindle coding "advantage of excellent course"

Spindle coding	Free node	Examples of interview content
Advantages of excellent courses	Preliminary integration with information technology	"Teaching design fully embodies the role of information technology in optimizing classroom teaching and changing students' learning styles"; "It embodies the integration of discipline characteristics and information technology, and highlights the classroom application of digital education resources"
	Great technology of Excellent course production	"The whole interface is very clear;" "Excellent class recording"
	Active interaction between teachers and students	"The interaction between teachers and students is frequent and deep;" "The classroom atmosphere is active";
	Rich Excellent course resources	"Full coverage of subjects, textbook versions and class hours;" "It covers the whole course and the whole subject"
	Student oriented teaching design	"The implementation of teaching fully embodies the characteristics of double subjects;" "Break through the key and difficult points and conform to the teaching law;"
	Teachers' demonstration and guidance	"Promote young teachers' self professional growth and master some skills in class;" "Teachers of the same subject learn from each other"

2. Demand analysis of excellent course teaching and research

Starting from different research identities, this study continues to carry out demand research based on the construction attitude, micro course design and platform development.

In the perspective of the application of micro lecture in the construction of teachers' teaching and research resources, the largest proportion of the survey opinions is "relatively good", which indicates that most people hold a positive attitude towards its future development; in addition, 55% of the respondents still think it is necessary to construct the micro class based on excellent courses from the perspective of core literacy teaching of different disciplines, accounting for the largest proportion. At present, the problems of long time and unclear direction of core literacy in the teaching and research of excellent courses are the obstacles to be solved urgently. The emergence of micro class helps to reduce the learning cost of teachers' research, and the concentration of high-quality content can also improve the quality of teachers' teaching and research. The demand for core literacy also responds to the requirements of "Chinese students' development of core literacy" [10], which confirms the view of Li Yingjie, that is, core The effective cultivation of mental quality is an urgent problem in subject teaching and the internal demand of educational theory and practice development. [11]

In the micro class length of teaching and research based on excellent courses, most of the respondents chose less than 15 minutes. Only university teachers, doctoral students and other research status chose 11-15 minutes more. Teachers and postgraduates tended to take 5-10 minutes more, and most of the teaching and research staff expected to be within 5 minutes. On the whole, regardless of the research status, the proportion is still 5-10 minutes, accounting for 40.7%. As shown in Table 4.

Table 4 The Length of micro class of Excellent course teaching research

How long do you think is suitable for teaching and research micro class resources based on excellent courses?					
Identity	within 5mins	5 to 10mins	11 to 15mins	16 to 20mins	21 to 30mins
Teaching and research staff	66.7%	0.0%	0.0%	33.3%	0.0%
Primary and secondary school teachers	10.3%	39.3%	26.9%	21.4%	2.1%
University Teachers	12.5%	12.5%	50.0%	12.5%	12.5%
Undergraduate Student	4.4%	48.9%	26.7%	13.3%	6.7%
Master Course Student	5.3%	42.4%	33.5%	13.5%	5.3%
Doctoral Course Student	20.0%	40.0%	40.0%	0.0%	0.0%
Others	14.3%	28.6%	28.6%	14.3%	14.3%

In the micro class based on excellent course teaching and research, the two most effective design forms are "topic introduction + excellent lesson examples + expert comments" (66.7%) and "theme introduction + expert lecture" (66.7%); in addition, primary and secondary school teachers, university teachers, undergraduate normal students, master and doctor graduate students and other research identities all think that "theme introduction + excellent lesson examples + expert comments" and "Experts explain the excellent lesson in the form of picture in picture" is the most effective. 91.7% of primary and secondary school teachers choose "theme introduction + excellent lesson examples + expert comments". The vast majority of respondents believe that this is the most effective form of design.

On the platform function of supporting excellent course teaching and research, teaching researchers tend to study guidance (66.7%), growth space (66.7%) and evaluation effect (66.7%); while primary and secondary school teachers account for a relatively high proportion in learning guidance (61.4%), growth space (53.1%) and access to resources (73.8%). University teachers and postgraduates tend to learn guidance, growth space, online discussion and access to resources. Therefore, on the whole, learning guidance, growth space and online discussion have the highest demand.

In general, the platform needs to meet the needs of increasing expert comments, optimizing the quality of excellent courses, refining the classification, maximizing the use of resources, giving play to the role and value of actual teaching and research, and supporting teachers or teaching research and other educators to use stably, continue teaching research and interaction, and finally feedback teachers' learning growth to realize personalized teacher learning.

RESULTS

1.Improve the lack of interaction by means of information technology, and give full play to the advantages of excellent teaching and research

From the perspective of the familiarity of excellent course resources, "lack of interaction with teachers and experts" is the primary problem of teachers' teaching and research. Lack of personalized teaching and research design, lack of high-quality lesson, lack of interaction with experts, lack of effective platform support, lack of management mechanism and incentive system guarantee are all existing barriers.

Therefore, it can be found that: in the understanding of teaching researchers such as teaching researchers, teachers or graduate students, teaching and research design itself is more important, such as expert guidance interaction, personalized teaching and research, etc.; while doctoral students start from the perspective of auxiliary teaching and research tools, hoping that the external environment can provide support.

In the investigation of the advantages and difficulties of the teaching and research of excellent courses, the advantages mainly focus on the resources themselves, the role of teachers' self reflection and guidance, and the teaching and research can help teachers improve the teaching content and promote the development of teachers' professional quality. However, there are some difficulties such as insufficient interaction, lack of teaching feedback and evaluation of teaching and research results. Therefore, in the process of teaching and

research, we need to make full use of the advantages of excellent courses to design teaching and research activities and solve the difficulties in teaching and research.

In the application of excellent course teaching and research, the respondents support the construction of teachers' teaching and research resources by micro lecture, and they think it is necessary to build micro class based on excellent course from the perspective of core literacy teaching of different disciplines. The time of teaching and research micro class should be controlled within 5-10 minutes, which can be designed in the form of "theme introduction + excellent lesson examples + expert comments", so that teachers can learn to use and evaluate excellent courses. As for the platform, the respondents hope that the platform can increase expert comments, optimize the quality of excellent courses, refine the classification, maximize the use of resources, give full play to the role and value of actual teaching and research, and support teachers or teaching research and other educators to use stably, continue teaching research and interaction, and finally feedback teachers' learning growth, so as to realize intelligent teaching and research and teachers' individualization study.

2. According to the needs of users, play the role of the main body

Table 5 Coding of teaching and research requirements for excellent courses

Open coding		Core coding
Node name	Spindle coding	
Government led	External conditions	Curriculum content demand; curriculum design demand; curriculum resource demand
Network demand		
In line with the new curriculum standards	Course content requirements	
Innovative teaching methods		
Guidance by famous teachers or experts		
Integration of information technology		
Embody the discipline accomplishment		
Teacher discussion	Curriculum design requirements	
Systematic design		
Teaching and research guidance		
Contradiction between work and study		
Question bank resources	Demand for curriculum resources	
Technical resources		
High quality lesson		
Multimedia resources		
instructional design		
Teaching plan		
Thematic teaching and research	Demand of teaching and research mode	
Micro course teaching and research		
Production of teaching and research achievements	Demand of teaching and research evaluation	
Application of teaching and research achievements		

The government led teaching and research activities can promote the participation of teachers in teaching and research, and set up a certain incentive mechanism to improve the external motivation of teachers' independent participation in teaching and research. The video clips of excellent courses can be integrated into the form of micro courses, which can alleviate the network problems.

In order to improve the utilization rate of excellent courses in teaching and research, we should select the excellent courses which conform to the new curriculum standards as the teaching and research course examples. By means of expert explanation and sharing by famous teachers, the teaching concept behind the excellent course is explored to promote the professional development of teachers.

It is the premise of teachers' teaching research to clarify the teaching and research objectives, so as to carry out teaching research more targeted, and teachers are more clear about the content of teaching research. Teachers' discussion can promote the mutual exchange of teachers of the same subject. Discussion area can be set up in the course, and topics can be set for teachers' discussion according to the key and difficult points of teaching and research, so as to promote teachers' in-depth construction of teaching and research content.

The demand of educational researchers for curriculum resources includes question bank resources, technical resources, high-quality lesson cases, multimedia resources, teaching design, teaching plan, etc.

The teaching design, teaching plan and so on reflect the concept and idea of teachers' classroom teaching into the teaching and research of excellent courses to help teachers grow up.

A variety of new teaching and research models based on excellent courses, such as school-based teaching and research mode, heterogeneous teaching and research mode in the same class and micro video teaching and research mode, to a certain extent, alleviate the contradiction between work and study, and expand the participation of evaluation subjects.

REFERENCES

Notice of the State Council on printing and distributing the 13th five year plan for the development of national education-Government portal of the Ministry of education of the people's Republic of China[EB/OL].[2020-7-31].http://www.moe.gov.cn/jyb_xxgk/moe_1777/moe_1778/201701/t20170119_295319.html.

Zheng Shizhong, Zhang Deli. Inheritance and Transcendence: [J]. training from primary school teachers' teaching and research to Internet plus Teaching, 2016(10): 22-25.

Zhang Xiaohong, Zhang Jing, Xiong Jianwen, et al. The construction of hierarchical linkage teaching and research mode -- Taking Middle School Physics as an example [J]. Curriculum, textbook, teaching method, 2018,38 (06): 78-83

Hong Liang. School based teaching research transformation strategy and path in the era of big data [J]. China Education Journal, 2015 (07): 78-81

Wang YONGGU, Chen Junwen, Ding Jihong, et al. Construction and application of digital portrait of data driven teacher network training community -- data analysis based on "Zhejiang famous teachers network" [J]. Journal of distance education, 2020,38 (04): 74-83

Xiao Chuan, Hu Lele. On school based teaching research and teachers' professional development [J]. Teacher education research, 2007

Liu Yi, Xiu Yadi, Zhang Shaona, et al. Lesson teaching and research: exploring the teaching and research wisdom of excellent courses [J]. Digital education, 2019, 5 (02): 52-57

Notice of the general office of the Ministry of education of the people's Republic of China on carrying out the activities of "A Teacher an Optimal Lesson" in 2019 - government portal website of the Ministry of education of the people's Republic of China [EB / OL]. [2020-7-31] http://www.moe.gov.cn/srcsite/A06/jcys_ jyzb/201903/t20190311_ 372911.html.

Hu Xiaoyong, Zheng Xiaodan, Feng Zhizhi. A study on the excellent course case of deep integration of information technology and Teaching [J]. China audio visual education, 2015 (04): 36-40

Zhang Sheng. "Internet plus" era, smart campus to implement core literacy of students to train [EB/OL]. [2016-10-14]. http://www.moe.gov.cn/s78/A16/s5886/s7822/201611/t20161102_ 287408.html.

Li Yingjie, Wang Tongyan. Construction of academic standards of Chinese subject based on core literacy [J]. Educational science research, 2018 (07): 5-10

Environment for Developing Information Literacy in Regional Survey Learning: A Case of Utilizing Geographic Information System Tools at Hakodate Area

Yoshikazu YAMAGUCHI
yamaguchi.yoshikazu@h.hokkyodai.ac.jp
Associate Professor
Hokkaido University of Education, Hakodate Campus
Hakodate, Japan

This report shows several methods of utilize local teaching materials as New Information Literacy. In the Social Studies Supplementary Material in Hakodate, maps with different styles are mixed. By using the map in the supplementary material and GIS together, understanding of students can be promoted. In the lesson of the 3rd grade elementary school last October, the children were able to understand the 100-year change in the resident population of the city. In some cases, supplementary video material may be created. Currently, Hakodate City is making DVD teaching materials to improve elementary school students' understanding of the area. In combination with GIS, children are expected to associate multiple pieces of information and produce high-quality results.

Key words: Regional Study, GIS, Map, Information Literacy

INTRODUCTION

In Japanese society recently, educational policy is planned and implemented in which schools play a central role in restoring the ties of the local community. For this reason, special activities in school place importance on collaborative events. In the learning scene, regional surveys are being widely adopted.

Many local governments have been devising ways to create local teaching materials. A common practice is to create a side-reader in 3rd and 4th grade social studies in elementary school. In some cases, supplementary video material may be created. For example, in Hakodate City, a DVD "Takara no Machi Hakodate (it means Hakodate with a wealth of historical and cultural assets)" is being created for elementary school students to promote and support local understanding.

However, to make effective use of such supplementary video materials, it is necessary for students not only to view them but also to relate the contents and results that they have examined to the information of the materials. This association between students' survey result and the contents is also important as an important opportunity to build new generation Information Literacy.

In this report, I would like to propose a teaching material environment for integrating some information while utilizing the GIS data "Chiriin Chizu" (webmap provided by Geospatial Information Authority of Japan) as a basis. At the same time, I would like to devise teaching materials to reduce the disparities between regions and the differences in teacher experience.

LITERATURE REVIEW

Itou (2010) reports many practices and materials in Geography Lessons. As some examples, Ito introduces “Beer factory distribution map” by means of GIS software “Chizu-Taro” , “Status of new store

openings” by “MANDARA” and so on. Tokieda and Kimura (2019) report GIS with digital devices. They recommend arcgis maps. Beside these practices, Arai (2019) introduces some practices that use old maps and statistic resources. Many geography lessons begin to use GIS and data in recent years.

On learning environment or analysis tools, some reports have been made. Tani (2018) develops a tool for analyzing and expressing geographical data: “MANDARA”. This software is famous for easy for use among social studies teachers. Asahi et al. (2019) are introducing extremely detailed information on how to use QGIS and Open data that local governments own and publish.

Educational study group of GIS Association of Japan (2017) published a guidebook for teachers that want to utilize GIS for their lessons. MILT (2012) also published a similar guide a few years ago. However, the content of these guidebooks may be difficult for many teachers except some experts.

METHODS

The research questions in this report are as follows:

RQ 1: How maps appear in sub-reader of social studies (i.e. regional studies for elementary school)?

RQ 2: How are maps utilized in social studies in elementary school

I would like to consider the abilities of reading and expressing map information as new literacy and the possibilities of GIS through these questions.

In this report, I adopt the sub-reader that Hakodate city has published in this spring (2020nendoban shougakkou 3, 4gakunen shakaika fukudokuhon: Watashitachi no Hakodate [Our Hometown Hakodate: Social studies sub-reader for elementary 3 and 4 grade, 2020 ed.]).

RESULTS

Maps included in side-reader of social studies (regional survey)

First, at the sub-reader of social studies for elementary and middle school students, "Our Our Hakodate" (2020 version), published by the Hakodate City Board of Education. In the side-reader, the map information shown in Table 1 is posted (the target is about 60 pages of learning contents for third grade elementary school students).

If we make a rough classification, maps have two functions: First function is to understand the current spatial arrangement such as current land use and distribution of major industries. Second is to understand the time axis such as the transition of historical buildings and population distribution.

Some maps are easy for third grade students to understand the situations and circumstances around Hakodate city. On the other hand, other maps are difficult for them to grasp properly the information presented. In order for the maps included in the side-reader to promote the students' understanding sufficiently, it is necessary to devise the stylistic aspect. For example, all maps are devised so that they have the same scale, color, and shape.

Table 1: Map included in the social studies sub-reader at Hakodate (3rd grade only)

・Location of Hakodate City as seen from the whole of Hokkaido (p.3)
・Administrative divisions in Hokkaido (range of each promotion station, p.4)
・Hakodate City land use map (color code according to usage, p.5)
・Hakodate City Harbor/Fishing Port (p.8)
・Hakodate Port distribution map (p.11)
・Supplies of raw materials for seafood (p.33)
・Distribution of major fishery food factories in Hakodate (p.34)
・Transition of boundaries due to merger of local governments (p.51)
・Trend of tram map (p.52)
・Changes in major transportation networks(1986 to 2019, p.53)
・Comparison of land use distribution(1976 to 2014, p.54)
・Installation location of new public facilities (p.55)
・Changes in major residential areas (pp.56-57)

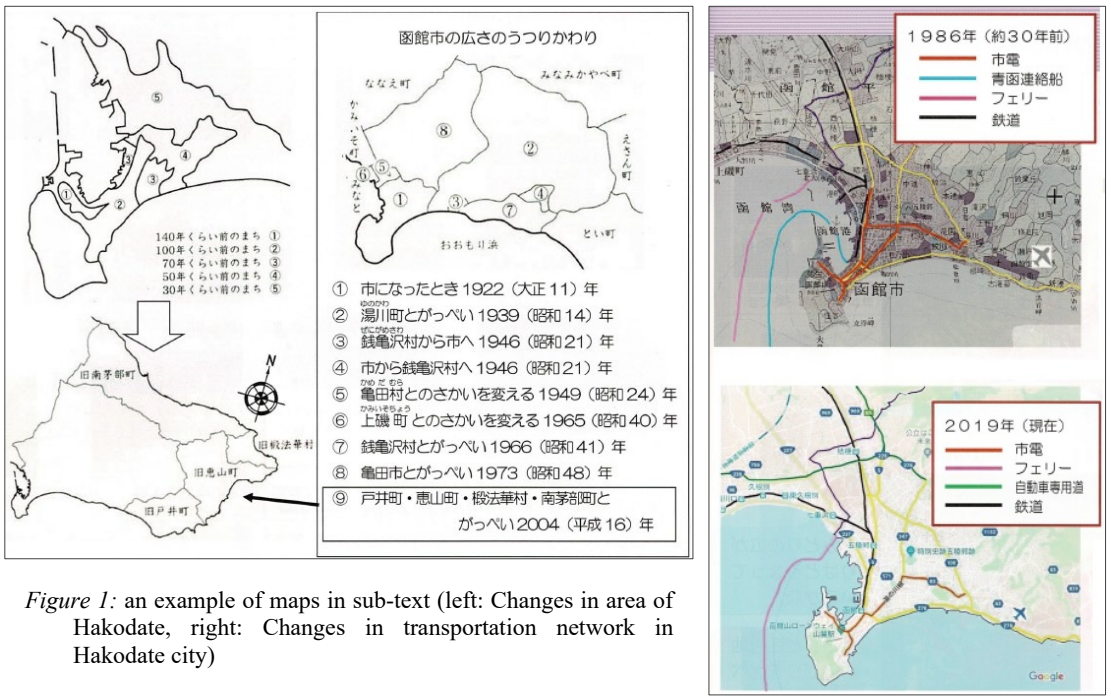


Figure 1: an example of maps in sub-text (left: Changes in area of Hakodate, right: Changes in transportation network in Hakodate city)

Maps included in side-reader of social studies (regional survey)

On November 29, 2019, the "Elementary School Social Studies Study Club," which is one of the academic study groups in Hakodate City, held a proposed lesson on social studies for the purpose of effectively utilizing regional information. Figure 2 shows lesson scenes there. This is a study in which third-grade students introduce groups of famous tourist spots in each period(100, 80, 60, and 30 years ago), using old maps and photographs. Some findings were gained through the discussion with several teachers. Most of the 3rd year students who participated in this class were able to understand the distribution of residential areas in the city that we saw every 20 to 30 years. The teacher in charge was able to manage the lesson easily by overlaying multiple pieces of information on the map. The teachers of the study group members said that they would like to devise the map used in this class so that it is convenient to carry.

Figure 2: Regional Studies materials that 3rd grade students have drawn through activities.

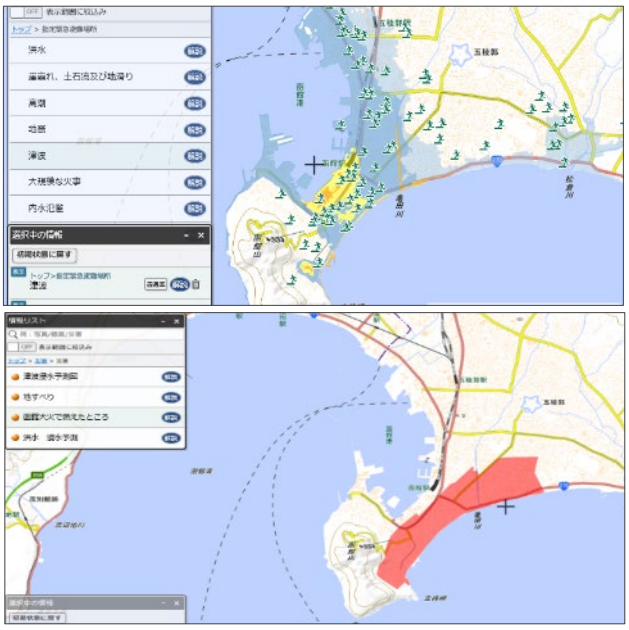


Figure 3: A case of expressing disaster information of Hakodate on WebGIS "Chiriin-Chizu [Geographic Map]"

DISCUSSION

First, "Information Literacy" is positioned as the basis in the current course of study of Japanese elementary school.

Figure 3 shows an image of a "tsunami inundation prediction map" and "the area burned down by a large fire in 1934". Within the “Chiriin-Chizu(Web GIS)”, there is a function to color the area with polygons. By way of this function, it is possible to expect a space for using teaching material resources in which elementary school children express what they have examined on a map, and other grades and residents reuse the data.

Students in the class mentioned above were concentrated and understood changes in Hakodate. It can be expected that the addition of GIS materials will help improve students’ regional understandings.

Second, what materials are needed to further support elementary school children's understanding of the region? Hakodate City Planning Department produces video teaching materials for elementary school students. This video material tries to convey the charm and problems of the area at the same time (Hakodate city, Department of planning policy, 2020). Since this teaching material comprehensively introduces local issues, it is effective to associate the contents with map information (Figure 4).

The Geospatial Information Authority of Japan is currently providing

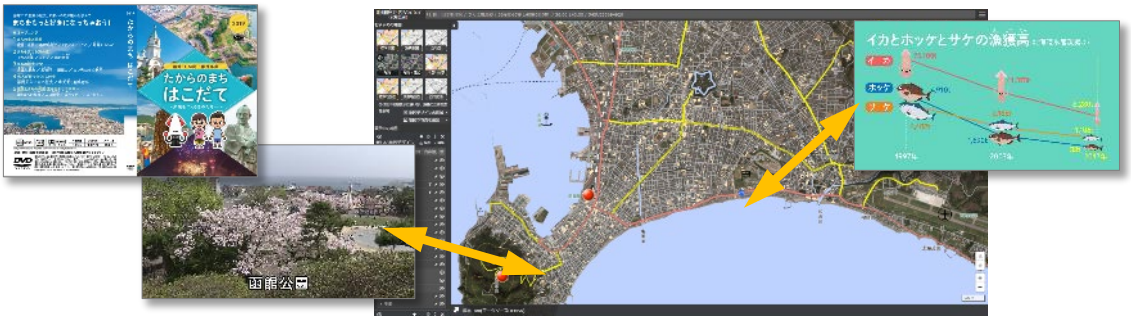


Figure 4: An example to relate WebGIS with regional resources to enhance students' understanding.

Figure 5 Curriculum plan about Programming Education in Temiya-Chuo elementary school, Otaru city. (Column shows grade progression and row indicates month.)

Japanese language　social studies

math　science　home economics

music　art　living environment

integrated studies

two versions, the raster version and the vector version, as the "Chiriin-Chizu [Web Geographic Map]". It is expected that they will be able to use these two well and try to associate information.

Third, it seems that the mapping of the curriculum such as the school will function as a table of discussions that makes full use of the relevance of learning activities and regional characteristics. Figure 4 is the curriculum map created by Temiya Chuo Elementary School (Otaru city) to promote "programming education". This map includes two learning environments. One learning is that directly deal with regional materials such as Life Studies and Social Studies. Another environment is to study the area from a wide perspective, such as Integrated Learning and Home Economics.

Although the content of learning is wide, the use of common map information as a basis for discussion will promote local understanding. Currently, Japanese Ministry of Education aims for a school that connects with the community through the curriculum. The operation is expected to be supported by the "School Management Council" and the "Regional School Collaboration Headquarters". It is expected that the map edited by the school as one of the learning outcomes will serve as a medium for connecting with the community.

CONCLUSION

Many maps were used in the supplementary textbooks for social studies in Hakodate City. However, some of them have variations in style, which makes it a little difficult for elementary school children to understand. Effective use of teaching materials can be expected by using a common style and using GIS together. In the area learning for the third grade elementary school, which was proposed last autumn, children's understanding was promoted by using the devised map. There is a need for educational materials that can be used over and over again. Based on these findings, new proposals for teaching materials for regional survey learning are needed.

ACKNOWLEDGEMENT

I am grateful to members of Hakodate social studies club of primary teachers for joining me practices on regional learning. I also express my appreciation to Hakodate educational board for giving me a significant resource.

REFERENCES

Asahi, K., Ootomo, S., Mizutani, T. & Yamate, N. (2019). Kaitei shinban: Opendata + QGIS toukei bousai kankyo jouhou ga hitome de wakaru chizu no tsukurikata [Opendata and QGIS: How to Edit Maps to Display about Statistic, Disaster Prevention and Environment (revised ed.)]. Tokyo, Japan: Gijutsu-Hyoron-Sha

Arai, M. (2019). Chiri jugyou zukuri nyumon [Introduction to Teaching Geography lesson: Based on Social Studies in Junior High School]. Tokyo, Japan: KOKON Shoin.

Educational study group of GIS Association of Japan (2017). Chiri kuukan jouhou wo ikasu Jugyou no tameno GIS kyouzai [GIS teaching materials for classes that utilize geospatial information] . Tokyo, Japan: KOKON Shoin.

Hakodate city, Department of planning policy (2020). “Hakodate TOM suishin jigyou: machi wo rikaisuru shougakusei muke original eizou ni tsuite [Hakodate TOM Project: Original movie for elementary school students to understand hometown]” (Retrieved July 31, 2020, from https://www.city.hakodate.hokkaido.jp/docs/2019022700063/)

Hakodate city Educational Board. (2020). 2020nendoban shougakkou 3, 4gakunen shakaika fukudokuhon: Watashitachi no Hakodate [Our Hometown Hakodate: Social studies sub-reader for elementary 3 and 4 grade, 2020 ed.]

Itou, T. (2010). Itochiri-shiki Chiri no jugyou ni GIS [Way to Use GIS in Geography Lesson]. Tokyo, Japan: KOKON Shoin.

Ministry of Land, Infrastructure, Transport and Tourism (2012). “Shotou chutou kyouiku niwokeru chiri jouhou system (GIS) katsuyou no tebiki [Guidance for using Geographic Information Systems (GIS) in primary and secondary education]” (Retrieved July 31, 2020, from http://www.mlit.go.jp/kokudoseisaku/gis/gis/kyoiku/03_kyoin_tebiki_all.pdf

Tani K. (2018). Free GIS Soft MANDARA10: Perfect Master. Tokyo, Japan: KOKON Shoin.

Tokieda R., & Kimura K. (2019). Sumaho to PC de miru hajimete no GIS: “chiri-sougou” de GIS wo dou tsukauka [Introduction to GIS by use of mobile phone & PC: How to use GIS in comprehensive geography lesson]. Tokyo, Japan: KOKON Shoin.

Preaching without a Choir: Solutions to Global "Illectronisme"

Katherine Watson
bizarrissime@gmail.com
Professor
Orange Coast College
Costa Mesa, California, USA

Called *illectronisme* in French and translatable in an inexact way as "computer illiteracy", the phenomenon sweeping our world signifies deep and more broadly ranging lacunae, including what Tongia (2005) has called "ICT Challenges" such as thorny usability, erratic security, problematic robustness, irregular availability, and a persistent "digital divide", alongside what Legleye and Rolland (2019) have called "a lack of basic digital competencies" among about one third of the world's people. And rather than vanishing as more and more technological tools become available to more and more people, the divide is increasingly apparent that separates the "haves" from the "have-nots" of "the eight digital competencies" (Fulton, et al., 2016) defining the current digital environment, particularly in the 2020 era of pandemic.
The present paper presents for discussion five journalistic-style questions concerning the problem of *illectronisme* and how to address it. First, what it is will be discussed; second, it will be asked who is subject to the condition; third, it will be asked where in the geographical and intellectual domain *illectronisme* occurs; fourth, the question of why this phenomenon does occur and may be worsening will be addressed; and then, and finally, it will be asked how the problem might be solved.

Key words: Education online, technology, digital literacy, distance learning

INTRODUCTION

The French have a word for it: *Illectronisme*. Translatable in an inexact way as "computer illiteracy", the term *illectronisme* signifies deeper and more broadly ranging lacunae, however, including what Tongia (2005) has called "ICT Challenges" such as thorny usability, erratic security, problematic robustness, irregular availability, and a persistent "digital divide", alongside what Legleye and Rolland (2019) have called "a lack of basic digital competencies." And rather than vanishing as more and more technological tools become available to more and more people, the divide is becoming more apparent that separates the "haves" from the "have-nots" of "the eight digital competencies" (Fulton, et al., 2016) defining the current digital environment, particularly in the 2020 era of pandemic.

The present paper presents for discussion five journalistic-style questions concerning *illectronisme* and how to address it. First, *what* it is will be discussed; second, it will be asked *who* is subject to the condition; third, it will be asked *where* in the world's geographical and intellectual domains *illectronisme* occurs; fourth, the questions of *why* this phenomenon does occur and may be worsening will be addressed; and then, and finally, it will be asked *how* the problem might be solved.

RESEARCH DESIGN & METHODS

Research into the subject of *illectronisme* has been done formally, through the use of electronic library and literature searches, and informally, through electronic communication such as E-mail and Zoom discussions. The design of the research comprises a typical journalistic style of posing five principal questions and then discussing and proposing alternative answers to them. The questions are: What? Who? Where? Why? How?

Research design comprises the setting forth of the aforementioned five principal questions, consideration of sub-questions that might be included during the questioning process (e.g., in defining "what" *illectronisme* is, asking about distinctions between competency, literacy, and mastery, as Huvila (2012) suggests), and ensuring that each question is addressed without prejudice in an objective and complete way.

Research methods entail performing deep dives into literature, as well as posing questions via telephone or Zoom, along with E-mail in brief questionnaire format.

RESULTS

Results of the study reveal that governmental, academic, and social institutions, as well as private enterprises, behavioral analysts, and individual activists, have analyzed the phenomenon of *illectronisme* and come up with various—if not varying—solutions to a situation that has become in 2020 a worldwide problem.

As Simon (2018) has pointed out, governments see an economic interest in precisely defining and then quickly and effectively bridging the digital divide; in France, for example, a "rescue plan" has been devised both to boost the "participative economy" and also to keep people connected in case of need. Likewise, the United Nations has called upon member countries to join in a governmental-academic-social movement to boost Internet use and personal connectivity around the globe by at least one third, beyond what 2020 figures show, before 2025.

Academically, Rantala (2010) has suggested that "doing digital literacies as school practices", starting with young learners and continuing into the "lifelong learner" group, would at once improve learners' "comfort level" with things digital and also help them to overcome "techno-fear", isolation, and timidity. In the pandemic-era environment of isolation, educators are being called upon to assess learners' ability to use things digital as well as their ability to understand information that is ever more often transmitted through technology, without a teacher present either as a sage on the stage or as a guide on the side. Naturally, in countries where schooling is only spottily present and even then not predictably substantive, education of any kind might seem a chimera.

But then, there are libraries. Between the academic and the social lies the library, a resource for learning anything about everything. Librarians have typically seen their institutions as "meeting places of support" and in the twentieth and twenty-first centuries as "complement(s) to online learning" (Nicholson, 2017). Libraries in the United Kingdom, Germany, Lithuania, and the Netherlands are among many to offer free-of-cost programs "to improve media competence and knowledge". Médiathèques, where newspapers and magazines, books, films, radio presentations, recorded speeches, and old television shows are available, dot the francophone world; librarians train and guide users how to search for and gain access to materials, holding the belief that the person who has a sense of the solidaire (solidarity) will not feel left out, behind, solitaire (solitary, alone).

Socially, groups such as the European Fund for Society's Work and Inclusivity Project, as well as L'Europe s'engage have put forth practical plans in workplaces and in zones of popular public use, where people can learn free and hands-on how to perform basic tasks and how to become more comfortable with things electronic. These organizations deploy such statistical and graphical data as those of the French INSEE to define and meet where they are the social groups that have been "excluded", left behind, left out. In the United States, the Borgen Project's fight against poverty includes a battle to get everyone connected, so that each one of us can at once teach one other and help that one other to gain access to a virtual safety net and know how to use it.

Entrepreneurs in education and marketing have noted, as Berg (2013) puts it, that "those who are digitally illiterate will no longer simply be consumers of digital technology. They will be consumed." Berg proposes "incorporating digital literacy" in our lives in ways similar to those used by proponents of "math across the curriculum", "art across the curriculum", and the like, so that the entire populace will achieve at least a minimal level of literacy in digital technologies.

Researchers into online behavior and practices, such as Pai (2020), have predicted that pre-2020 definitions of the "digital divide" will have to be redefined. That is, the divide is no longer an invisible technological wall separating the urban "connected" from the rural "underserved" ; rather, it is now socioeconomically based, marked by a new set of "gig economy" workers, contractors who must depend upon the digital to survive and who have left their digitally illiterate fellow citizens in the dust.

Individual activists, such as the man behind the aforementioned Borgen Project, Clint Borgen, have connected with volunteer organizations worldwide to determine how to make people everywhere more literate generally and more digitally literate, specifically. The Project's Taylor Diamond has written that the non-profits ProLiteracy and the World Literacy Foundation, as well as the UNESCO Institute for Lifelong Learning and the University of Pennsylvania's Literacy.org have attracted financial and human interest across the globe.

The problem of *illectronisme* is real. It is deep. It is complex. The research that has led to this paper suggests that employers and employes, young people and old, women and men, rich and poor, are all

affected. Thus, all are stakeholders, necessary supporters, in the worldwide organization that is our global literate humankind.

REFERENCES

Berg, S. (2013.) The high cost of digital illiteracy. *HASTAC*. 4 August.

Colclough, C. (2017). Deepening the Digital Divide. The Future World of Work. *UNIGlobal*. Nyon, Switzerland: UNI Global Union.

Diamond, T. (2014). 5 Initiatives fighting illiteracy. Seattle, WA: The Borgen Project.

Fulton, C. and McGuinness, C. (2016). Your Learning in a Digital World. *Science Direct*. Retrieved https://www.sciencedirect.com/topics/social-sciences/digital-literacy

Laurent, A. (2019). Illectronisme : Quelles solutions pour les exclus ? *#Société#Numérique*. Paris, France : Usbek et Rica.

Legleye, S. and Rolland, A. (2019). Une personne sur six n'utilise pas Internet, plus d'un usager sur trois manque de compétences de base. *INSEE Rapport*. Paris, France : INSEE

Nicholson, K. (2017). Overview of recent innovation. *Innovation in Public Libraries*. Amsterdam: Elsevier.

Pai, S. (2020). The Real Digital Divide Confronting India. *Live Mint*. Retrieved

Rentala, L. (2010). Digital literacies as school practices. *Practising Information Literacy*. Elsevier, ScienceDirect.

Simon, M. (2018). Pourquoi le gouvernement veut lutter contre l'illectronisme. *#Société#Numérique*. Paris, France : Usbek et Rica.

Tongia, R. (2005). Information and Communications Technology for Sustainable Development. Bangalore, India: India Institute of Science

What can be more adaptive in ICT advanced higher education with neuro-diversity? From the perspective of educational communication

Tomomi TAKABAYASHI
tomomi_takabayashi@cyber-u.ac.jp
Assistant Professor
Cyber University
Fukuoka, Japan

Abstract: Adaptive learning has received increasing attention among teachers with basic skills in educational technology. Therefore, the system needs to be "adapted" to a broader learning experience, including special needs of developmental diversity, such as AS, ADHD, and LD. In educational communication, content knowledge is one of the elements, and it suggests that the system to adjust only on the difficulty of the quiz is a very limited use of adaptive learning than it can be. In this research, first, the traditional ideas of adaptive learning were reviewed, followed by the lists of possible adaptive elements of learning from the perspective of educational communication. Therefore, the adaptive points were also collected from real records in the literature of educational communicational practices with difficulties. In the discussion, the feasibility and needs of the adaptive points are shown for the next step to assist self-directed learning.

Keywords: Educational Communication, Learning support, Special needs education

INTRODUCTION

Teachers have many kinds of educational communication strategies to support learners. Various ways of delivering learning content can be used by both teachers and learners. Nowadays, the system that was invented to help teachers' instruction partially replaced that kind of communication, but still "adaptive learning" does not seem equivalent with the previous practice of teachers.

Artificial Intelligence can be smart to suggest the level of content for every student, but teachers have suggested many more options of learning support for various students for a long time. Technological aid, especially for students struggling with learning contents and learning strategies, are listed in the Results section of this study based on the experience of teachers who have supported students, including students with some difficulties, such as ADHD, AS, and LD. Literature review on support for special needs education is also reflected in the above-mentioned list.

ADAPTIVE LEARNING: HISTORY AND THEORY

In this study, adaptive learning is defined as a system that uses certain algorithms to help individual learners in an optimal way. It is a method of teaching that accommodates many patterns, from autonomous learners who do not need a teacher at all to learners for whom peer or others' assistance is essential to

maintain their learning activity. Nguyen and Do (2008), among many other projects of adaptive learning realization, listed what can be adaptive as “goals, interests, background and experience, individual traits, aptitudes and demographic information (p. 397)”. Furthermore, they referred to models of educational technology, such as learning styles and learner preferences, though their system’s scope does not reflect full options that appear in the learner models.

Presenting the main “adaptive” points of learning, this study clarifies what has been done to support learners individually with technological support.

Contents: Level of Knowledge and/or Skills

The function of adaptive learning is to suggest content, especially quiz, that is suitable for each learner. This kind of support is familiar enough among teachers to utilize the system since computer-assisted instruction (CAI) has a similar function, although the suggestion algorithm is different.

This study started as the contrast of this function. Although content suggestion according to the learners’ ability and experience is supported by many theories of statistics (e.g., item response theory), adaptive learning is sometimes underestimated. The system itself is inevitably original and firm. This important function should not be a limitation for the broader idea of “adaptive learning.”

Contents: Interest

The next best-known aspect of adaptive learning is suggestion that is tailored based on the interests of the learner. This is especially true in areas, such as language learning, where we can choose the content that is more suited to the learner's preferences and tailor different programs according to the learner's needs.

For example, the lesson unit and the text are stocked to be shared with many people with various interests. In the case of many people learning and developing the same level of English, the system offers a different unit to them based on the registered interests and tendencies of content preferences, such as units called art, celebrity, or even bioinformatics (Nielson, 2018). This would be effective in skill development, not content knowledge.

Delivery: Learning styles

According to Nguyen and Do (2008), there are several points for individual adjustment, and one of the most helpful points for various leaners is the adjustment regarding the way the material or lecture conveys the content according to the learners’ aptitude. One would like to learn from a video, while the other would prefer text-based understanding.

Theoretically, instruction that has a specific learning goal can ensure the same quality even if it uses a different medium. A typical case is the option of closed caption, which some Japanese university lecturers tried to provide for those who had hearing difficulties. If the system automatically suggests suitable delivery medium or if the system can automatically change the method of message conversion, such as “adaptive”

support, it will not only help learners with serious disabilities but also help learners potentially have some treats and preference.

ELEMENTS OF EDUCATIONAL COMMUNICATION TO BE ADAPTIVE

As mentioned above, the need for adaptive learning is especially high when there are many individual differences. When considering adaptive devices for communicating the content, the knowledge of educational communication, which considers educational activities as communication, is useful. The following is a list of traditional communication models and theories that have room for consideration, especially in adaptive learning systems (Table 1).

Table 1. Elements of communication models that can be more adaptive

Models and types of Communication	Components from the model	System Feasibility: Can it be more adaptive?
SMCR model (Berlo, 1929)	Sender, Message, Channel,	Very high: especially on the elements of message
ATI /TTTI (Cronbach, L. J., & Snow, R. E. (1977))	Aptitude / Treatment / (Task)	Very high: especially on treatment
Stages of technology adoption (Rogers, 2010)	Learner preference (Early adopter, Laggard)	High: especially for characteristics of early adopters
VAKT Learning style	Learner preference (visual, auditory, kinesthetic, and tactile)	High: especially among visual and auditory preference

Despite its shortcomings in capturing the reciprocity and dynamics of communication, Berlo's Sender-Message-Channel-Receiver (SMCR) model is particularly relevant to this discussion, as it divides the communication process into parts. If the system can automatically suggest or transform each of these parts to suit the characteristics of the learner, then "adaptive learning" in a broader sense can be achieved.

However, while the SMCR model suggests adaptive points, it does not provide specific measures. Here, as a case study of adaptive learning with a particular focus on "how to communicate" as in the SMCR, the next chapter will review traditional strategies for learning that have more difficulties in "how to communicate."

CASE STUDY: PRACTICES IN SPECIAL NEEDS EDUCATION

To find manual current adaption to each diverse learner, five books were reviewed in this study. Three of these manuals were about developmental disabilities and academic support for college students, and two were about the universal design of the learning environment. All the manuals were written by experts but were written for general teachers. The list is in the reference below. Table 2 shows the specific elements.

Table 2. Suggested Adaptive Supports Categorized by Various Neuro Tendency

Neuro tendency and difficulty	Individual adaptive support	System Feasibility: Can it be more adaptive?
Attention disorder on the task: Difficult to understand full instructions to answer the task	Simple instructions, especially for the written information, in the quiz	High: Task instructions can be divided into simple description, and important points can be highlighted
Attention disorder on the lecture: Lack of focus during long lectures	Scheduling active task or other free time to settle down	High: Automatic scheduling
Writing: Some letters are too difficult to write down	Audio support and choice to type is needed	High: Memo and writing aspects can be replaced with other tasks
Reading vague instructions: Cannot answer without clear instructions when working on argumentative tasks	Preparation with closed questions to support understanding	High – Middle: Not like just dividing; it is difficult to break down the tasks

Table 2 shows that it is necessary to discuss whether features to optimize individual learning help learners who really need support. Some features can be optimized not by technology but by themselves.

DISCUSSION: ADAPTIVE LEARNING FOR ALL

This study revisits aspects needed to further develop adaptive learning, especially individual optimization. First, we briefly reviewed the current scope of adaptive learning and then looked at another angle of optimization in the learning process, based on the theory of educational communication, that should be done.

Moreover, the study discusses what information and communications technology (ICT) can achieve based on the individualized response of the main characteristics that are considered in need of optimization.

Further discussion on whether this application responds to more individualized expectations or it is within the scope of self-adjustment and does not need to be adapted needs to be assessed in the future.

REFERENCES

Abe, T. (2017). Universal design and reasonable consideration in classrooms [in Japanese].

Armstrong, T. (2010). *Neurodiversity: Discovering the extraordinary gifts of Autism, ADHD, Dyslexia, and other brain differences.* Boston, MA: Da Capo Lifelong.

Berlo, D. K. (1929). *The process of communication: An introduction to theory and practice.* NY: Holt, Rinehart and Winston.Cronbach, L. J., & Snow, R. E. (1977). *Aptitudes and instructional methods: A handbook for research on interactions*. New York: Irvington.

Ishi K., Ikejima, K., Takahashi, T. (2017). Campus life FAQ for university students with developmental disorder [in Japanese]. Tokyo, Kobundo Publishing.

Nielson, K. B. (2018). Case Study: Voxy" English for Software Engineering"–The Conception and Creation of an E-Learning English-Language Course Tailored to Learners' Real-World Needs. *International Journal of Advanced Corporate Learning*, 11(2), 27-29.

Nguyen, L., & Do, P. (2008). Learner model in adaptive learning. *World Academy of Science, Engineering and Technology, 45*(70), 395-400.

Rogers, E. M. (2010). Diffusion of innovations. Simon and Schuster.

Sasaki, M., Umenaga, Y., (2010). *Developmental disorder of college students* [in Japanese]. Tokyo ,Kodansha publishing.

Takahashi, T. (2016). *Learning support for university students with developmental disorder* [in Japanese]. Tokyo, Kaneko publishing.

Tsurui, T., Yamamori, K.(2020). *Experience on the online education of faculty and students with disabilitie*s [in Japanese] Tsukuba University, 2020, July 29th Keynote.

Uchiyama, T. (2015). *Learning support for children with developental disorder in normal class* [in Japanese]. Tokyo, Minerva Publishing.

Study on the improvement of reading effect of children with reading difficulties in digital environment

Fang Yuanhao
1506645431@qq.com
Master Student
South China Normal University
Guangzhou, China

Liu Huan
819892197@qq.com
Master Student
South China Normal University
Guangzhou, China

The purpose of this study is to verify whether digital reading can improve reading comprehension and reading attitude of students with reading difficulties. Twenty students with reading difficulties were selected from two parallel classes in grade two by the method of Chinese scores and teacher nominations. They were divided into experimental group and control group according to the class. In the research process, a large number of digital picture book resources were used, combined with the self-designed test questions of teachers and the "Elementary Reading Attitude Survey" designed by McKenna and Kear, to carry out statistical analysis, verifying that digital Reading has good support and auxiliary effect on the improvement of Reading effect of children with Reading difficulties. Research findings :(1) students in the experimental group were significantly stronger than those in the control group in the "evaluation and appreciation" dimension. (2) students in the experimental class have significantly improved their performance in the three dimensions of "structural ability", "inference and explanation ability" and "evaluation and appreciation ability", and at the same time, their overall performance has significantly improved. (3) the reading attitude of students in the experimental class improved.

Key words: digital reading, reading difficulties, reading effect

INTRODUCTION

Reading is an important way for human beings to acquire knowledge, broaden their horizons and increase their wisdom. It is also an important way to promote the improvement of national quality and social civilization. Reading is closely related to the growth of children. Reading has a profound impact on the growth and development of every child. Learning to read is one of the basic skills that every child must have. However, many children have problems with reading. They have normal intelligence and equal access to education, but their reading scores lag significantly behind the average for their age group. With the popularization of mobile intelligent terminal devices and the rise of mobile Internet, the way of human reading gradually changes from traditional paper text reading to digital reading with intelligent devices as the medium. According to the guideline of the 13th Five-Year Plan for National Reading released by the government in 2016, "Traditional reading and digital reading should be combined to improve reading quality and level.". Contemporary children is the generation of growth with new technology, called "digital natives", they will be able to quickly adapt to the digital reading way, combined with digital reading product joined the pictures, video, animation, and interactive activities, etc., greatly inspired the children's reading interest, research shows that the use of e-books and digital picture books for reading has become a difficulty reading children's reading intervention in a way. This paper focuses on digital reading and investigates its influence on reading ability and attitude of difficulty reading children, so as to find new opportunities for intervention of these children.

1.Reading difficulties

Dyslexia is one of the main types of learning disabilities in children. According to the presence or absence of organic lesions, dyslexia is classified into acquired dyslexia and developmental dyslexia. The

former is caused by brain damage, while the latter is caused by dyslexia related to reading in healthy individuals. The world health organization says, Developmental dyslexia (Developmental dyslexia, "DD") refers to the individual in general intelligence, motivation, living environment and education condition, etc have no difference with other individuals, there was also no clear vision, hearing, nervous system disorders, but its reading scores significantly lower than the corresponding age should be level of a state. Reading difficulties in this study refers specifically to developmental dyslexia. As for the study of dyslexia, the research at home and abroad focuses on the detection and diagnosis of dyslexia, the causes of dyslexia and the intervention strategies of dyslexia. Through literature research, it is found that the diagnosis of dyslexia children mostly adopts the methods of international scale test and teacher nomination. This study will use teacher nominations and Chinese scores to identify dyslexic children. As for the causes of Chinese reading difficulty, there have been two major debates in the academic circles, namely, the theory of language specificity and the theory of non-language specificity. According to the theory of language specificity, dyslexia originates from the processing defects at the linguistic level. Dyslexia has difficulties in the representation and processing of speech information, and their other cognitive abilities and information processing abilities are intact. Dyslexia nonverbal specificity theory argues that the normal development of sense perception is senior cognitive, language and speech development prerequisites, dyslexia is deeper and more basic visual and auditory disorder, its basic reason lies in the language of auditory and visual ability damage or development is imperfect, the core of the theory is no language specificity, the developmental dyslexia is not confined to the linguistic level. In terms of the intervention of dyslexic children, domestic scholars focus on the intervention of morpheme awareness and phonological awareness under the traditional environment, starting from the characteristics of Chinese itself. Digital context-based dyslexia interventions are just beginning. Wang Tingting et al. interacted with 50 dyslexic children in the second semester of the first grade of a junior high school in Beijing by using the human-computer dialogue system of "Yixueling", and found that the reading comprehension of dyslexic children was improved [1]. Compared with China, foreign research on the intervention of children with dyslexia in digital environment started earlier. Jerome Elkind conducted a multi-sensory intervention on 28 middle school students with reading difficulties by using Bookwise, a computer-based reading system, to read literary works for one and a half hours a day, and found that 70% of the students' reading comprehension ability could be improved, roughly reaching a grade or higher level [2]. By comparing e-books with paper books, Ertem found that readers with reading difficulties could remember more story details and information when reading e-books, participate in reading for a longer time and improve reading comprehension ability of dyslexic children [3]. Schneps has proposed a method of reading called Span Limited Tactile Reinforcement (SLTR) based on digital environments. High school students with dyslexia have improved their reading speed and comprehension by using large font to display text on small screen handheld devices and by manually scrolling vertically to read the text [4]. It can be seen that digital environment provides a new opportunity for the intervention of dyslexic children. However, most of the interventions for dyslexic children at home and abroad are in the form of laboratory or classroom intervention, so it is hard to carry out extensive reading for long-term intervention. Based on the digital environment, this study adopts the method of extracurricular intervention to provide new ideas for the intervention of dyslexic children.

2.Digital reading

Digital environment is a new communication environment compared with traditional communication environment. In this study, the digital environment is the exponential word reading environment.Research on children's digital reading focuses on two dimensions. The first dimension is the comparative study of the effects of digital reading and paper reading. There are two differences in the discussion of the findings. The first is that there are significant differences between digital reading and paper reading. FathI.Mde through the comparison of paper books and e-books, found that e-books can improve children's reading ability[5]. F.Günes consider that if there is no effective text structure, the cognitive map of the brain may reduce the reading comprehension effect. Screen reading leads to more cognitive load because it makes the brain's information-building process denser and more complex than paper reading [6]. Another view holds that the difference between digital reading and paper reading is not significant. L.M.Singer and P.A.Alexander through the experiment, found that students' understanding of the text is not different between different media.[7]. J.H.Hou pointed out that the paper version and its digital equivalent use the same text rendering, and there is no significant difference in reading comprehension[8]. The second dimension is factors influencing digital reading behavior. Text content and length, cognitive, technology, gender and aesthetic can affect digital reading behavior. For example, D.Mizrachi suggested that students prefer digital media if the text is less than 5 pages long, while students

prefer paper media if the text is more than 10 pages long[9]. It can be seen that digital reading has unique advantages and can provide conditions for the intervention of children with difficulty reading children.

RESEARCH DESIGN & METHODS

1.Methodology

In order to deeply study the effect of digital environment on reading comprehension and reading attitude of difficulty reading students, the author carried out observation and research in the experimental school. The purpose of this study is to integrate digital picture books through Wawayaya software and provide them to students of the experimental class in winter vacation. After that, it is necessary to check whether the reading attitude and reading scores of students with reading difficulties have changed after reading with digital picture books. The researcher selected 90 students from the second-grade parallel classes of A Primary School in Guangzhou to participate in this study. Through the method of language scores and teacher nomination, 20 difficulty reading students were selected and randomly divided into two groups, one group as the experimental group and the other as the control group. Students in the experimental group used digital picture books provided by researchers for reading and learning, while students in the control group used paper picture books. Two groups of students read a digital picture book every day, and complete each picture book matching exercises. After that, the scores of the two groups were measured and recorded. The scores were compared with those before the experiment, and the application effect was analyzed.

2.Participants

In this study, 20 difficulty reading children were selected as the experimental subjects. The students participating in the experiment were "digital natives" who were familiar with the information environment and could get started quickly by using multimedia resources. Therefore, the technical factors of the students themselves would not affect the experimental results. In order to avoid the influence of Hawthorne effect on the experimental subjects, this research based on the natural environment, asked the students with reading difficulties to carry out digital reading together with the class in the way of holiday homework during the experiment. Before the beginning of the experiment, the participants' reading attitude and reading ability were tested, and the scores were recorded and counted, which objectively reflected the real level of the experimental group and the control group before they participated in this study.

3.Materials

Reading attitude refers to the feelings or ideas expressed by readers during reading activities. Mckenna and Kear conducted a survey on reading attitudes of students from grade 1 to 6 and developed a questionnaire for measuring reading attitudes of primary school students (ERAS) [10]. This questionnaire divides students' reading attitude into academic reading attitude and leisure reading attitude. Academic reading attitude refers to students' mood and feeling when they read paper in school class, and leisure reading attitude refers to students' mood and feeling when they read paper at home or after class. The survey of reading attitude in this study adopts the form of questionnaire. The design of the questionnaire refers to the questionnaire on reading attitudes of school-age students by Mckenna and Kear. Students' reading attitudes are divided into academic reading attitudes and leisure reading attitudes, with 10 questions each. Reading attitude scale of this research through SPSS22.0 reliability for each dimension inspection, the dimensions of Cronbach 's Alpha were greater than 0.80, and through the KMO and Bartlett sphericity test to analyze the validity of the questionnaire, the various dimensions of the validity of all above 0.80, shows that the overall good reliability and validity of the feature test, so the test data is valid.

The reading ability of this study refers to the reading comprehension ability. For the definition of reading comprehension, the academic community has not formed a unified understanding. Mo Lei put forward that reading comprehension can be divided into two parts:the microstructure understand and macro structures understand, Wen Hongbo on this basis, to analyze the article reading activities, Chinese reading process is further divided into macro understanding of reading, microscopic understanding of reading, evaluating reading, and divergent reading, namely second order four factor model. Using this model for reference, this study selected the evaluation dimensions suitable for second-year students, namely, structural ability, information extraction ability, inference and explanation ability, overall generalization ability, evaluation and appreciation ability and divergence ability. At the same time, draw lessons from the second grade Chinese reading test questions developed by Morley team, and select the

test questions that conform to the above dimensions, so as to collect students' scores before and after the experiment, and timely obtain the data of the experimental group and the control group.

Data-analysis

This study was carried out through winter vacation. Students in the experimental class and control class read one assigned picture book and completed exercises every day for 21 days. The experimental class used digital picture books for reading, while the control class used paper picture books for reading. The reading test questions before and after the test were designed with six dimensions, among which the divergence ability dimension was verified by short answer questions, and the rest were tested by multiple choice questions, with a total of 90 points. The test questions of reading attitude adopt three dimensions: leisure reading attitude, academic reading attitude and digital reading attitude. After the end of the test, the obtained data were processed, all the test questions and questionnaires were recovered on the spot, and the test papers of the students in the experimental class and control class were completely disrupted. Team members and teachers scored them together, so the results obtained through the entity were objective.

SPSS22.0 was used to analyze the scores of the experimental group and the control group. The experimental scheme of this experiment adopts one-way ANOVA before and after test model of experimental group and control group. In order to determine the original degree of similarity between the experimental group and the control group, the experimental group and the control group participated in the experiment to carry out traditional paper reading ability test and reading attitude survey. Through the analysis of test scores, the reading ability of the two groups of dyslexic students is basically at the same level. Researchers counted their scores, the average scores of 20 difficulty reading students before the experiment were obtained. The scores of the two groups of difficulty reading students were statistically analyzed before the experiment. The probability of the differences was inferred by one-way ANOVA, so as to determine whether the difference is significant. The statistical results are described in Table 1.

Table 1. reading scores before and after experiment

dimension	experimental			control		
	pretest	posttest	Sig. (2-tailed)	pretest	posttest	Sig. (2-tailed)
structural ability	7.00	9.00	.343	4.00	8.00	.104
information extraction ability	8.00	14.00	.005	8.00	12.00	.373
inference and interpretation ability	9.00	11.00	.343	10.00	14.00	.343
integrated generalization ability	6.00	9.00	.081	7.00	7.00	1.000
evaluation appreciation ability	4.00	8.00	.037	5.00	3.00	.343
divergent ability	11.00	14.10	.104	11.90	10.60	.469
overall reading scores	45.00	65.10	.003	45.90	54.60	.338

As can be seen from Table 1, the mean total score of the experimental group were 45, and the mean total score of the control group were 45.9. Based on the above data, the following hypothesis was established to test whether the overall reading ability of the experimental group and the control group was significantly different.

H0: There was no significant difference in reading ability between the experimental group and the control group.

H1: There is a significant difference in reading ability between the experimental group and the control group.

As can be seen from the test results in Table 2, the P value of hypothesis test is 0.882, greater than 0.05, so hypothesis H1 is rejected. At the same time, P values in all dimensions of the experimental group and the control group were greater than 0.05, so it can be concluded that there was no significant difference in reading ability between the experimental group and the control group in the data of the two groups.

Table 2. one-way ANOVA in reading ability pretest

dimension	Sig. (2-tailed)
structural ability	.196
information extraction ability	1.000
inference and interpretation ability	.722
integrated generalization ability	.660
evaluation appreciation ability	.673
divergent ability	.509
overall reading scores	.882

At the same time, this study investigated the reading attitudes of the experimental group and the control group before the experiment. Through the scale data analysis, the reading attitudes of the two groups of difficulty reading students are basically at the same level. Researchers statistics 20 dyslexic students reading attitude scores，the data with the one-way ANOVA of variance to infer differences occur probability, to determine whether the two average difference significantly. The statistical results are described in Table 3.

Table 3 reading attitude before and after experiment

dimension	experimental			control		
	pretest	posttest	difference	pretest	posttest	difference
academic reading attitude	28.50	30.20	1.700	31.80	31.50	-.300
leisure reading attitude	28.20	28.90	.700	30.80	33.10	2.300
general reading attitude	56.70	59.10	2.400	62.60	64.60	2.000

As can be seen from Table 3,the mean total score of reading attitude of the experimental group was 76.70, while the mean total score of the control group was 82.80. Based on the above data, the following hypothesis was established to test whether there were significant differences between the experimental group and the control group in terms of overall reading attitude.

H0: There was no significant difference in reading attitude between the experimental group and the control group.

H1: There were significant differences in reading attitudes between the experimental group and the control group.

As can be seen from the test results in Table 4, the P value of hypothesis test is 0.218, greater than 0.05, so hypothesis H1 is rejected. At the same time, P values in all dimensions of the experimental group and the control group were greater than 0.05, so it can be concluded that there was no significant difference in reading attitudes between the experimental group and the control group in the data of the two groups. It can be concluded that the reading scores of students in the experimental group and the control group are similar to their reading attitudes, and the data results in the later stage of the experiment will not be affected by the grouping.

Table 4. one-way ANOVA in reading attitude pretest

dimension	Sig. (2-tailed)
academic reading attitude	.156
leisure reading attitude	.279
general reading attitude	.218

Through the intervention of dyslexic children, researchers and teachers collaborated to carry out a post-test of reading ability in the experimental class and the control class, and calculated the reading scores of each student after participating in the experiment. Comparing the results of the data before and after, can be observed by table 1, since the implementation of the experimental group the reading ability of all dimensions are improved, structural ability to improve the two points, the information extraction ability rose by 6 points, the inference and interpretation ability raised two points, integrated generalization ability to improve the three points, evaluation appreciation ability to improve the four points, improving the ability of divergent section by 3.1 points, 20.1 overall reading scores have improved. The paired sample T-test was used to test the significance of the changes before and after the test, and it was found

that the experimental group significantly improved in the evaluation appreciation ability section, the information extraction ability and the overall reading score. In the control group, the structural ability, information extraction ability, inference and interpretation ability and overall performance were improved, but not significantly. At the same time, the integrated generalization ability remained unchanged, while the evaluation appreciation ability and the divergence ability decreased. Data comparison between the experimental group and control group found that in the structural ability of the experimental group score higher than the control group, the information extraction ability of the experimental group scored higher than the control group, the ability of inference and interpretation section of the experimental group scored slightly lower than the control group, the integrated generalization ability part of the experimental group score higher than the control group, the evaluation appreciation ability part of the experimental group score is higher than the control group, the score difference of 5 points, divergent ability part of the experimental group score higher than the control group, experimental group overall reading ability score than the control group, difference reached 10.50 points. However, whether there is a significant difference in overall reading scores between the experimental group and the control group needs to be further verified. Based on the above data, one-way ANOVA was used to test whether there was a significant difference in reading ability between the experimental group and the control group, and the following hypothesis was established:

H0: There was no significant difference in reading ability between the experimental group and the control group.

H1: There is a significant difference in reading ability between the experimental group and the control group.

According to the test results in Table 5, the P value of hypothesis test is 0.187, greater than 0.05, so hypothesis H1 is rejected and hypothesis H0 is accepted. However, by analyzing the test results of the two groups in various dimensions, it was found that in the dimension of " evaluation appreciation ability ", the P value was 0.024, less than 0.05, that is, the score of the experimental group in " evaluation appreciation ability " was significantly higher than that of the control group.

Table 5. one-way ANOVA in reading ability posttest

dimension	Sig. (2-tailed)
structural ability	.556
information extraction ability	.511
inference and interpretation ability	.408
integrated generalization ability	.288
evaluation appreciation ability	.024
divergent ability	.056
overall reading scores	.187

At the same time, all students in the experimental group and control group were given a posttest of their reading attitude through the reading attitude scale. The content of the scale was the same as the pretest, and the reading attitude score of each student after participating in the experiment was calculated. By comparing the data before and after the test, it can be seen from Table 3 that the experimental group has improved in "leisure reading attitude", "academic reading attitude" and overall reading attitude. In the control group, "academic reading attitude" and overall reading attitude were improved, but the "leisure reading attitude" was slightly decreased.

RESULTS

Through the comparison of reading ability and reading attitude of the difficulty reading children in the experimental class, it is found that the overall reading ability score of the digital reading class is higher than that of the paper reading class, and the overall reading level of the digital reading class is significantly improved, especially in the evaluation ability and the information extraction ability. According to Pevio's dual coding theory, the multimedia features brought by digital environment broaden the channels of information processing for students, so that they can have a more comprehensive grasp of

knowledge and make their own objective and comprehensive evaluation of the contents in picture books. By viewing and enlarging the pictures, students can consolidate the text information in picture books in a timely manner, deepen their memory, and thus improve their ability to extract information. The other dimensions, although not significantly improved, showed an overall upward trend. At the same time, through the training of digital environment, the students in the experimental class have been improved in all dimensions of reading attitude. Therefore, it can be concluded that digital media environment has a positive effect on reading ability and attitude of difficulty reading children.

By comparing the experimental group and control group, the ability of inference and interpretation section of the experimental group score than the control group was only slightly lower, because it requires students to calm down and quietly, but digital environment tends to aggravate the cognitive load of students with reading difficulties, which leads to their lack of attention. Therefore, it is difficult for students to calm down and infer the context of the article，and the physical environment, only the text, students' cognitive load is smaller, easier to concentrate. Therefore, the cognitive load of students in the control group was low, which promoted their reading attitude higher than that in the experimental group. However, in addition to "inference and interpretation ability", the ability of the other dimensions of the experimental group was higher than that of the control group, which indicates that digital reading should be combined with paper reading to jointly help difficulty reading children overcome dyslexia.

Digital environment can help difficulty reading children to obtain rich information, and paper environment can cause difficulty reading children to think and infer. Therefore, front-line teachers are suggested to combine paper reading with digital reading in class to jointly promote the reading level of difficulty reading children.

REFERENCES

WANG Tingting , ZHANG Chong , YAO Ru& MENG Wanjin , The Improvements of the “YiX ue Ling System” on Reading Comprehension: Evidence from an Eye-movement Study for Students with Dyslexia[J]. Special Education in China, 2015(08):49-55.

Elkind J , Cohen K , Murray C . Using Computer-Based Readers to Improve Reading Comprehension of Students with Dyslexia[J]. Annals of Dyslexia, 1993, 43(1):238-259.

Ertem I S . The effect of electronic storybooks on struggling fourthgraders' reading comprehension[J]. Turkish Online Journal of Educational Technology, 2010, 9(4):140-155.

Schneps Matthew H,Thomson Jenny M,Chen Chen,Sonnert Gerhard,Pomplun Marc. E-readers are more effective than paper for some with dyslexia.[J]. PloS one,2013,8(9).

Ihmeideh F.M.The Effect of Electronic Books on Enhancing Emergent Literacy Skills of Pre-School Children[J].Computers&Education, 2014 (79) :40-48.

GUNES F.Kagittan ekrana okuma alanindaki gelismeler (From paper to screen developments in the field of reading) [J].Bartin university journal of faculty of education, 2016, 5 (1) :1-18.

HOU J H, RASHID J, LEE K M.Cognitive map or medium materiality?Reading on paper and screen[J].Computers in human behavior, 2017, 67:84-94.

MIZRACHI D.Online or print:which do students prefer?[M].Cham:Springer International Publishing, 2014:733-742.

Mc Kenna M C, Kear D J. Measuring attitude toward reading: A new tool for teachers[J]. The Reading Teacher, 1990, 43(9): 626‐639.

Practice and effect of video media workshop by student exchange

Atsushi Nagao
nagao.atsushi@kagawa-u.ac.jp
Kagawa University
Takamatsu, Japan

Naka Gotoda
gotoda.naka@kagawa-u.ac.jp
Kagawa University

Takayuki Kunieda
kunieda.takayuki@kagawa-u.ac.jp
Kagawa University

Ryo Kanda
kanda.ryo@kagawa-u.ac.jp
Kagawa University

Rihito Yaegashi
rihito.yaegashi@kagawa-u.ac.jp
Kagawa University

Kagawa University and Shibaura Institute of Technology are adopted by Cabinet Office for “Interaction Promotion Project for University Students in Rural and Tokyo Area. Kagawa University held a short-term summer educational program "Visual Media Workshop " in Zentsuji City, Kagawa Prefecture. Students from Shibaura Institute of Technology and Tsuda College participated from Tokyo, and a total of 28 students participated together with students from Kagawa University. In this program, the project by the students in some universities to give them the initial education in the field of media and Tourism studies in Kagawa. We discovered the charm of Zentsuji through fieldwork and worked on the planning and production of a promotional video to introduce it. We have created a promotional video to discover the charm of Zentsuji City and introduce it. In this program, we actually worked on the production of video works, and screened and presented the works on the final day. Judging was conducted based on "excavation of charm," "uniqueness," and "promotion." This program showed the possibility to be the initial education for local understanding and other professional fields such as policy planning

Key words: Visual Media Workshop , Student Exchange Program, local revitalization ,

INTRODUCTION

The Law for the Creation of Town, Person, and Businesses (Law No. 136 of 2014) was promulgated in 2014 to halt the decline in population and the concentration of population in the Tokyo area and to promote regional development. At the same time as this, Kagawa University was selected by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) for the "Center of Community (University COC Project)", and is implementing the "Revitalization of the Setouchi Region and Development of a Center of Community through Cooperation with Local Governments" project. In this project, we collaborate with seven cities and towns in Kagawa Prefecture and Kagawa Prefecture to promote regional understanding and solve regional problems through the revitalization of remote islands and shopping streets. Specifically, the university should strengthen its functions as a core presence in the local community through the following three points: (1) development of community-oriented courses that incorporate fieldwork, (2) enhancement of research that contributes to local industry and employment, and (3) creation of a university that permeates the community through the establishment of satellite offices. In the education program, we are implementing the Project/Problem based Learning (PBL)-type educational program "Setouchi Region Revitalization Project", which is aimed at resolving regional

issues. Our goal is for students to deepen their understanding of the local community and develop an attachment to it by participating in the resolution of local issues, and to discover and explore local issues and work towards their resolution, and to acquire a proactive and positive attitude. In addition, in cooperation with the companies in Kagawa Prefecture, we are working on "development of community-oriented human resources", "construction of a regional employment support system" and "creation of attractive regional companies and creation of employment". Specifically, (1) implementation of active learning, (2) promotion of internships, and (3) implementation of Liaison Café. Through these three points, we are promoting human resource development for regional industries, aiming to accumulate human resources who will play a central role in regional development. In the educational program, we developed an internship program "Regional Internship" to promote regional understanding through active learning and work experience. Thus, Kagawa University aims to develop local human resources through PBL and internship-based educational programs. Shibaura Institute of Technology is a university of engineering with 4 faculties and 2 graduate schools, and has been selected for the SGU project (globalization-driven). Through the SGU project, we have developed the "Global PBL" PBL educational program for developing problem-solving workshops with overseas students and companies, and an internship program that aims to develop human resources for global activities through work experience at overseas companies. Shibaura Institute of Technology aims to develop global human resources through PBL and internship-based educational programs. In 2018, Kagawa University and the Shibaura Institute of Technology were selected by the Cabinet Office for the "University student convection promotion project in the local area and Tokyo area" and the university student convection promotion project "Let's feel Kagawa! The "Student Project for Living in Udon Prefecture" is being implemented. One of the highlights is the collaborative program between national universities and private universities. Tsuda University is also participating in this project from 2019. Tsuda University established the School of Policy Studies in 2017, and its main focus of education is to understand the current situation and issues in the region and to acquire problem-solving skills through practical learning in policy planning. In this paper, we introduce the program "Let's inform about Kagawa in Zentsuji" - a workshop for communicating the attractiveness of the region through visual media - which was implemented from 2019.

RESEARCH DESIGN & METHODS

Design Thinking has been incorporated into the educational program at Kagawa University. Design Thinking is to provide new and unexpected value in various fields, including business, through a cycle that starts with the discovery of issues based on empathy for people's latent needs, followed by idea generation, prototyping and testing. The basic idea is to be user-centered, emphasize communication with team members and users, and repeat trials, tests, and improvements.

The objectives of this program are: (1) to make a video for problem solving with local people, (2) to solve the problems of the community with students who have different values, and (3) to have the students watch the prototype and perform the verification phase.

Outline of the field

Zentsuji City is located in northwestern Kagawa Prefecture, with an area of 39.88 ㎢ and a total population of 32,927 (according to the 2015 census), and is the gateway to Zentsuji Temple. In addition to the Zentsuji Temple, there are other holy sites on Shikoku, such as Mandala Temple, Kozan Temple, De Shakka Temple, and Kanakura Temple. In this study, we have produced a variety of specialties, such as lettuce and kiwifruit, and glutinous rice cake (Daishimochi).

Program Description

The study was conducted over four days and three nights from August 6-9, 2019.A total of 28 students, 10 from Shibaura Institute of Technology, 8 from Tsuda University, and 10 from Kagawa University, participated in the workshop. Students were divided into seven groups for the production of video content in advance, so that each university was divided into seven groups.The students were assigned the task of planning and producing a promotional video to introduce the attraction of Zentsuji City in Kagawa Prefecture.

The final output had the following three points.

(1) Presentation (2 minutes) and video (3 minutes) on the appeal of Zentsuji

(2) Introduction of intentions and technical innovations

(3) How to get your work seen

The evaluation criteria were also disclosed in the guidance. The three points are as follows.

(1) Discovering the appeal

Is this a work that unearths the charm of Zentsuji City and makes the audience want to visit Zentsuji City?

(2) Originality and uniqueness

Does the work have a youthful originality that is not limited by other works?

(3) Promotion

Is it designed to be seen by many people?

Table 1 shows the outline of the program schedule. The students in the Tokyo area left Tokyo by bus in the middle of the night on August 5 and arrived at Kagawa University in the morning of August 6. After that, we did fieldwork at a shopping mall in Takamatsu, which is an example of the revitalization of the central area of the city, and then traveled to Zentsuji City by JR. Students in the Tokyo area commented that Zentsuji station is unusual because it does not have an automatic ticket gate. After moving to the site, a mini-lecture on video content production was given by the faculty member in charge at the beginning of the session. The contents of the lecture include how to create a scenario based on scenario engineering, explanation of equipment such as cameras, tripods, and sound equipment, and how to compose a picture. Next, a keynote speech was given. In Zentsuji City, we had a lecture on problem solving using design. After that, I moved to Kaikosha and had an exchange meeting with Zentsuji city officials. The students and faculty members stayed at a lodging house in Zentsuji Temple, the head temple of the local temple.

On the second day, I woke up at 5:30 am and participated in a zazen session at Zentsuji Temple (Figure 1). In the morning, a keynote lecture was given by a staff member of Commerce, Industry and Tourism Division of Zentsuji City. The lecture was focused on the current situation and issues in Zentsuji City. After that, we held a workshop with Zentsuji City officials (Figure 2). One person in each group, mainly from the Policy Division and the Commerce, Industry, Commerce and Tourism Division, participated in this study. The students interviewed the staff based on the keynote lecture. At lunchtime, udon lesson and making of udon noodles were held. The participants learned how to make udon noodles, a specialty of Kagawa Prefecture, from a local women's association . In the afternoon, the field survey was conducted.

day	Content
6-Aug	
8:00	Orientation
	Fieldwork in Takamatsu and Zentsuji City
	Keynote speech ①in Zentsuji City
7-Aug	
5:30	Zazen experience
	Keynote speech ② in Zentsuji City
	Workshop with city staff
12:00	Udon noodle making experience
	Fieldwork①
	Scenario Production
	reconsideration
8-Aug	
	Fieldwork②
	Video Production①
9-Aug	
	Video Production②
	Presentation event

Table1 Outlines the Program Schedule

Figure 1

Figure 2

On the third day, we conducted fieldwork in the morning to brush up. The fieldwork on the third day was accompanied by Zentsuji city officials(Figure3). In the afternoon, we worked on photography and editing at the same time. After returning to the dormitory, the editing process continued until late at night.

Figure3

On the fourth day, in the morning, we worked on the film production to complete it. In the afternoon, we held a presentation of our work (Figure 4).

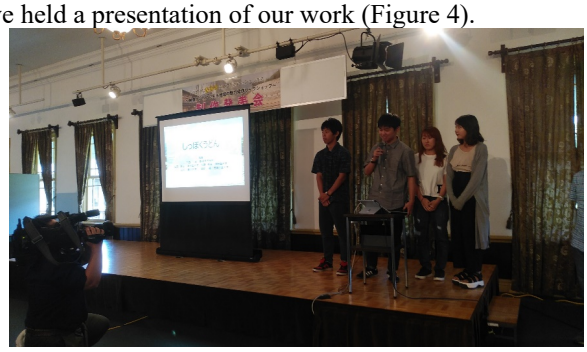


Figure 4

RESULTS

An analysis of the trend of the seven completed works shows that in the field of tourism PR, the works for students' travel and the works of "Muggyu-chan", the character of Zentsuji City, for foreign tourists who visit the city in English were produced. There were one music video-like PR film, one role-playing game, one science fiction film, and two short movies, offering a wide variety. Some of the teams filmed at 22 locations throughout the city and edited the video. Some of the videos were shot with the permission of the locals, and we appreciate the fact that they include not only the scenery but also the scenery of daily life. We believe that the students were able to increase their understanding of the region through their experiences and fieldwork. All of the works are of a high level, and we could produce many works that can be shown to the public by adjusting the level of the sound sources and making minor corrections to the copyrights. On the point of having a production, a student commented in the post-learning session, "We had to work hard because we had to make the movie in detail, but we felt a sense of accomplishment. There was an opinion that. From these results, we can conclude that a high learning effect was achieved.

As for the challenges. In terms of facilities, we were very satisfied with the location, but it was difficult to download software due to the lack of Wi-Fi environment. The selection of facilities is also a necessary requirement for implementing a program like this one with on-site feedbacks. This program

aims to realize regional revitalization and development through the production of video works that introduce the characteristics and attractions of the region.

REFERENCES

[1] Suzuki, K., Hara, N., Furukawa, N., Nishinari, N. and Yamada, K. (2018), Verification of Practice and Educational Effectiveness in "Setouchi Regional Activation Project", Kagawa University Educational Research (15), pp.175-188

[2] Kagawa University "Let's feel Kagawa! The "Student Project for Living in Udon Prefecture"Udon Prefectural Livelihood Student Project", Kagawa University, https://www.cpp.ao.kagawa-u.ac.jp/(Reference 2020.6.10)

[3] Kanda, R., Yaegashi, R., Miyamoto, S., Matsunaga, T., Nagao, A., Gotoda, N., Kometani, Y., Kanisawa , H.,(2020), The Practice on the Initial Education of Construction and Architecture by Students' Interaction in Kagawa, and its Effectiveness, Japan Engineering Education Association (accepted)

Exploratory Formative Research on Instructional Design Principles for Learners with Special Needs in Physical Computing Education

Jai Hong Lee
leejai@snu.ac.kr
Doctoral student
Seoul National University
Seoul, Republic of Korea

Juhyeon Park
jhp1218@snu.ac.kr
Masters student
Seoul National University
Seoul, Republic of Korea

Yoojin Bae
youjin826@snu.ac.kr
Masters student
Seoul National University
Seoul, Republic of Korea

Cheolil Lim
chlim@snu.ac.kr
Professor
Seoul National University
Seoul, Republic of Korea

Abstract: This research focuses on altering and modifying existing physical computing education instructional design principles to suit learners with special needs. To achieve this, physical computing education instructional design principles were uncovered through an extensive literature review. To accommodate for learners with special needs, Universal Design for Learning (UDL) was also extensively reviewed. Through altering the uncovered physical computing education design principles and UDL principles, this research's instructional design principles were developed. The design principles were then subject to expert validation, done through surveys, and were modified according to the received feedback. Through the modified design principles, a short program was conducted to ensure that the principles were applicable in school and educational settings. After receiving learner, parent, and educator's feedback on the program, the instructional design principles were revised and improved for a final time.

Keywords: Physical Computing Education, Special Education, Instructional Design Principles, Universal Design for Learning

INTRODUCTION

With the Fourth Industrial Revolution arose the need for education to enhance computational thinking. To meet this need, software education has been adopted as a general subject matter and a required part of various K-12 curricula around the world (Angrisani et al., 2018). For example, in the case of South Korea, software education is gradually becoming a required subject for elementary, middle, and high school students since the nation's curriculum was revised in 2015. For South Korea, software education includes learning programming with unplugged activities and physical computing (Ministry of Education, 2015). In the United States, STEAM (Science, Technology, Engineering, Mathematics) education provides physical computing education through convergent classes. In the case of the United Kingdom, the nation has emphasized the need for physical computing for elementary school students since 2014 (Song & Gil, 2017).

However, most educational materials and tools utilized in unplugged, programming, and physical computing activities in software education can be difficult for students with special needs to fully access. Examples of this would be certain learners with special needs having low cognitive ability due to

linguistic limitations as well as peer-related issues due to adaptive behavioral problems and lack of social skills (Lee, 2003). For such reasons, learners with special needs are only taught the simple use of certain software tools in software education rather than tasks that require, test, and challenge their problem solving abilities (Kim, 2017). In lieu of this, it becomes necessary, then, to promote equity in physical computing courses to reach learners who would not be able to fully immerse themselves in these classes otherwise.

This research seeks to alter existing instructional design principles for physical computing education to efficiently suit learners with special needs with the purpose of promoting equal opportunity for learners. In addition, this research proposes possible guidelines in which equity and the closing of the education gap can be promoted through the altered design principles considered within the concept of the universal design for learning. It should be noted that universal design for learning has been specifically chosen for this research due to its framework that it can be used to meaningfully engage learners, including those with disabilities through proactively addressing learning barriers (Center for Applied Special Technology, 2011; Rose & Meyer, 2002) and because it is seen as one of the possible solutions for both special and general educators who are seeking to develop lesson plans that can accommodate a diverse learner population (Spooner et al., 2007).

In this research, there is an emphasis on the learner, parent, and educator responses on the altered instructional design principles. This was done to improve the design principles as well as to verify whether it would be applicable in schools and educational centers. Overall, this study is guided by the following research questions:

1. What are the instructional design principles for learners with special needs in physical computing education?
2. What are the learners' educators', and parents' responses to the developed instructional design principles?

RESEARCH DESIGN & METHODS

To answer the research questions above, this research utilizes the formative research methodology. As one of the qualitative research methodologies, the formative research methodology focuses on prescription and comprehensiveness of instructional strategies (Lim & Yeon, 2007; Reigeluth, 1989; Reigeluth & Frick, 1999) and was introduced to overcome the limitations of quantitative research methods which holds interest in statistical effectiveness of each hypothesis (Chung, 1997; Richey & Nelson, 1996).

Using this particular methodology, the stages used for this research are as follows: (1) uncover existing physical computing education instructional design principles through an extensive literature review and alter them to fit the context of special education and learners with special needs through the

umbrella of universal design for learning; (2) validation and feedback by six experienced educators (5-18 years experience) in the field of physical computing education and special education followed by first revision; (3) second revision based on the validation and feedback by experts; (4) program development and program execution; and (5) design principle finalization based on the pilot program participants.

RESULTS

The initial physical computing education instructional design principles identified through an extensive literature review are the following:

Components	General Principles from literature review
Physical computing teaching aids	- Robotic, modular, board type teaching aids for physical computing (Kim & Chun, 2018; Koo & Woo, 2018) - Prepare a variety of materials and tools, considering students' physical computing level (Kim & Lim, 2019) - Programming class using appropriate teaching devices has a positive influence on logical thinking (Lee, Jeon, & Kim, 2017)
Supporting staff	- Staff with educational, technological, and scientific background for planning, tutoring, evaluating (Katterfeldt, Dittert, & Schelhowe, 2015)
Opportunity to explore physical computing tools	- Provide exploration activities to have a grasp of materials and tools (Kim & Lim, 2019) - Specific operational activity (Kim & Chun, 2018) - Performance-based education (Koo & Woo, 2018) - To learn with physical computing, students are introduced to sensing technologies, simple microcontrollers, and actuators (Przybylla & Romeike, 2014)
Providing examples	- Provide a simple example and demonstration to figure out components and characteristics of physical computing tools (Kim & Lim, 2019) - Provide several educational resources to get an idea of how to utilize physical computing tools (Kim & Lim, 2019)
Ensuring safety	- It should not have any risk of safety-accident (Lee, Jeon, & Kim, 2017) - It should not use harmful materials (Lee, Jeon, & Kim, 2017)
Students' characteristics	- It should be relevant to developmental stages of elementary school students (Lee, Jeon & Kim, 2017)
Problem-solving context	- Provide a problem-solving context for physical computing to let learners ensure the purpose of the system that they try to design (Jeon & Kim, 2019)

The identified instructional design principles of physical computing education were then altered into the universal design for learning's elements and sub-elements. The elements of UDL are: (1) representation; (2) action & expression; and (3) engagement. The sub-elements of UDL consist of: (1-1) perception; (1-2) language & symbols; (1-3) comprehension; (2-1) physical action; (2-2) expression & communication; (2-3) executive function; (3-1) recruiting interest); (3-2) sustaining effort & persistence; and (3-3) self-regulation. A total of 26 initial instructional design principles were developed: 9 sub-

instructional design principles with the representation element, 8 within action & expression, and 9 within the engagement element.

Through a validation and feedback process, done through surveys and interviews with six educators in the field of physical computing education and special education, it was discovered that while the initial instructional design principles strongly reflected the necessary components for physical computing education, it was suggested that the degree of concreteness be unified and that the instructional design principles be more catered and reflective of the characteristics of learners with special needs. Through this feedback, the instructional design principles were revised accordingly.

Through the revised instructional design principles, a 60-minute program utilizing the physical computing tool MicroBit was developed. The program's learning objectives were for the learner to recognize problems in a given situation and present the solutions and utilize MicroBit to solve the problems. The program consisted of three parts: (1) an introduction portion to lead the learner to check safety guidelines for physical computing and to grasp the learning objectives through watching exemplary videos related to physical computing; (2) a development portion allowed an opportunity for the learner to tinker, explore, design, and code to solve situational problems; and (3) a consolidation stage that allowed the learner to reflect on the lesson.

Due to the situation surrounding COVID-19, the program was conducted on one learner with developmental coordination disorder. In regard to the program, the learner stated that she appreciated the fact that she was able to make a certain product during the short time the program took place. However, she also stated that it was difficult for her to understand some of the concepts covered in the program. The educator involved in the program conveyed similar thoughts, suggesting different methods (e.g. videos or scaffolding) to teach complex concepts. Requests of a "bigger" tool (same tool but larger) have also been given. Finally, the parent emphasized the necessity and importance of this research in that there is a severe lack of availability of such activities for learners with special needs.

Through these responses, the five areas of improvement were deducted: (1) not only should the tools be organized according to the learner's physical computing level but the tools themselves should be varied as well (e.g. through size); (2) the content should be simplified to promote learner understanding; (3) while learners asking questions can indeed serve as checkpoints, questions should also be more specifically designed (e.g. frequency, how questions are asked) to ensure the learner's class progress is accurately measured; (4) the learner's characteristics (e.g. in relation to IEPs) should be closely considered and identified; and (5) vocabulary and concepts should be delivered and addressed more thoroughly and with diversity. Through the feedback by program participants, some of design principles were revised. The finalized instructional design principles are as follows:

Table 1: Finalized Instructional Design Principles for Physical Computing Under the Universal Design for Learning Framework

Categories	Principles	Explanations or Examples
1. Representation		
1-1. Perception	1-1-1. Clearly model and demonstrate required work and physical computing tool usage for students through utilizing various media.	• Utilize different ways, such as computers, websites, whiteboards, and on-hand examples to model tool usage.
	1-1-2. Allow students to access educational resources for physical computing tools and tasks which can be accessed in different ways.	• Have manuals and/or handbooks (physical and/or media) available for students to access both in and outside the classroom. o Have reading programs installed for learners who prefer to listen than to read.
	1-1-3. Have a variety of materials and tools available for students of varying physical computing skills and levels.	• For a specific learning task, categorize materials and tools according to different skills and levels, so that students are able to take that into consideration when choosing theirs for their tasks. o Have certain tasks, materials, and tools color-coded according to a certain level for student comprehension (e.g. green = beginner, red = expert). o Have it shape-coded as well (e.g. stripes = beginner, polka dot = expert) o Include tools of varying sizes in order to provide enhanced visual understanding
	1-1-4. Identify all physical computing tools and objectives that students can utilize.	• Before the lesson or learning task, point out and go through all the physical computing tools that students can utilize as well as the lesson/task objectives.
1-2. Language & Symbols	1-2-1. Teach and regularly review specific vocabulary and content related to physical computing and coding.	• Have an online and/or actual worksheet where vocabulary and content can be written with ease (fill in the blank for notes, vocabulary sheet, etc.). o Have vocabulary be delivered in multiple ways, such as delivery through media (e.g. YouTube).
1-3. Compre-hension	1-3-1. Clearly state the lesson's content, goals, that will be covered as well as the purpose.	• Use the whiteboard and clearly state the topics and goals that will be covered in class (oral, written, etc). • Go over why what they are learning might be important and relevant to their lives and society.
	1-3-2. Make the physical computing content and tasks interesting and relevant to the student, according to the student's age, culture, situation, etc.	• Have initial discussions on what they are learning and why it is important to their lives and society. • Use recent events and news (articles or clips) to initiate relevance to the topic/lesson. • Make it age appropriate (especially for media usage).
	1-3-3. Provide a problem-solving context for physical computing to ensure learners know the purpose and applicability in real life.	• Make the questions and tasks for lessons highly relevant by linking it with real-life events (most preferably recent and/or well known). Also take this moment to simplify physical computing terms and concepts. • Using the real-life examples provided by news articles and clips, pose questions and tasks that directly relate to the presented situation.

	1-3-4.
	Provide and receive questions as it can function as learners' comprehension checkpoints.
		• Model good behavior and responses to when and how questions are asked.
		• Have class time devoted to questions (and answers) at frequent, but short, intervals.
		  o Have question time in between activities and at the end of class while encouraging students to ask questions anytime.
		• Have the question be asked more thoroughly and in different ways.
		  o Ask "Yes/No" questions about same contexts in a different way
		• If necessary, frequently use questions to measure learner progress before, during, and after learning task.

2. Action & Expression		
2-1. Physical Action	2-1-1. Include unplugged activities that show the relationship between abstract and difficult concepts.	• Utilize cards, puzzles, board games, worksheets that make students perceive physical computing education as intellectually stimulating, and interesting. o Let students break down many (problem) situations such as preparing for breakfast to practice computational thinking skills including decomposition and algorithm.
	2-1-2. Use assistive technology to help learners to function in the classroom.	• Select hardware or software that allows coding with keyboard shortcuts in addition to dragging and dropping with a mouse.
2-2. Expression & Communication	2-2-1. Provide learning contents to let students subsume new concepts into existing knowledge by practicing it.	• Make new materials relevant to the existing knowledge by comparisons and cross-referencing of new and old ideas.
	2-2-2. Give opportunities to choose what kind of presentation for demonstration.	• Give options for presentation including PowerPoint, oral report, poster to demonstrate what they have made and learned. o Allow students to express their thoughts and what they have learned by selecting a preferable medium including designs, videos, music in the presentation.
	2-2-3. Have students raise their questions to make physical computing activities more challenging.	• Let students challenge others with questions they have developed based on their understanding of the physical computing concepts, etc. respectfully.
2-3. Executive Function	2-3-1. Guide students to set simple goals for problem-solving projects.	• Define clear learning objectives on the bite-sized content (what students want to know and do after).
	2-3-2. Support students to monitor their progress through different methods of assessment.	• Record students' progress by planning checkpoints that are available during lessons to check students' understanding and progression. • Enable students to get additional support from teaching assistance. (teacher evaluation & peer, self-assessment (multiple levels of assessment)
	2-3-3. Facilitate students to manage	• Emphasize the use of rubrics and checklists for self-assessments.

	their plans and develop strategies for learning.	
3. Engagement		
3-1. Recruiting Interest	3-1-1. Optimize individual choice and autonomy when deciding physical computing materials and tools.	• Offer opportunities to explore more than one physical computing tool and materials. ○ Examples: Microbits, SK Albert AI
	3-1-2. Optimize relevance, value, and authenticity in the problem-solving context with physical computing.	• Offer several topics and questions for brainstorming before class. ○ Mock problem
	3-1-3. Minimize any risk of safety-accident.	• Instead of using electronic devices or tools, utilize unplugged tools to design circuits. • Offer the manual about the safety lesson and test and summary the manual on the 1st class.
3-2. Sustaining Effort & Persistence	3-2-1. Vary learning tools and physical computing materials to get what they try to design.	• Let learners investigate physical computing materials and tools to optimize their product
	3-2-2. Foster community with similar interests	• Make a group with members who have similar interest and opinion after deciding the topic they deal with, • Reach outside of school (inter-school) ○ Internet community, After school activity, Club
	3-2-3. Repeat mastery-oriented feedback while prototyping.	• With a checklist, ask how they solve the problem on the design and development process.
3-3. Self-Regulation	3-3-1. Demonstrate to figure out the components and characteristics of physical computing tools.	• Review the role of components of the final product such as sensors and actuators through writing, performing, recording, or other means.
	3-3-2. Share the final prototyping with peers.	• Have a presentation about the final product after prototyping with checklists and rubrics.
	3-3-3. Promote productive failure.	• Keep reviewing positive feedback while prototyping. • Track a thinking process periodically through group projects logs or more.

There are three implications to consider when utilizing this research: (1) a thorough analysis of the learner is needed before and during instruction – specific information about the learner's special needs is needed from either a special education specialist, the school, or the parent; (2) questions and problems that are posed toward learners need to be simplified and well-designed (e.g. simplifying problems and carefully designing questions according a learner's level); and (3) a systematic approach and a clear designation of roles of every involved individual is needed (e.g. set of individualized principles for different situations – co-teachers, TA, peers, etc.).

REFERENCES

Angrisani, L., Arpaia, P., Bonavolonta, F., & Moriello, R. S. L. (2018). Academic FabLabs for industry 4.0: Experience at University of Naples Federico II. *IEEE Instrumentation & Measurement Magazine, 21*(1), 6-13.

Center for Applied Technology (2011). About UDL. Retrieved from http://cast.org/publications/UDLguideliens/version1.html.

Chung, J. S. (1997). A decision-oriented research methodology for educational technology: Focused on development research. *Journal of Educational Technology, 13*(2), 339-359.

Jeon, H., & Kim, Y. (2019). Explore Problem-Based Learning Cases for Developing Physical Computing Challenge Task. *In Proceedings of the 2019 Conference on the Korean Association of Computer Education, 23*(2), 11-14.

Katterfeldt, E.-S., Dittert, N., & Schelhowe, H. (2015). Designing digital fabrication learning environments for Bildung: Implications from ten years of physical computing workshops. *International Journal of Child-Computer Interaction, 5*, 3–10.

Kim, K. (2017). A study on ICT usability and availability of between Korean students and OECD students: Focus on PISA 2015. Journal of The Korean Association of Information Education, 21(3), 361-370.

Kim, T, & Chun, S. (2018). Development of Educational Application for Physical Computing using Android Smartphone. *Journal of the Korean Association of Information Education, 22*(6), 639-649.

Kim, K., & Lim, C. (2019). A developmental study of an instructional model for maker education using Single-Board Computer(SBC) in elementary school. *Journal of Educational Technology, 35*(3), 687-728.

Koo, D., & Woo, S. (2018). The Development of a Micro: bit-Based Creative Computing Education Program. *Journal of The Korean Association of Information Education, 22*(2), 231-238.

Lee, S. H. (2003). Early Childhood Special Education. Seoul: Hakjisa.

Lee, Y. J., Jeon, H. G., & Kim, Y. (2017). Development and applyment selection standards of physical computing teaching aids for elementary SW education according to the 2015 revised curriculum. *Journal of the Korean Association of Information Education, 21*(4), 437-450.

Lim, C. & Yeon, E. (2007). Formative research on design principles for procedural simulation. *The Journal of Educational Information and Media, 13*(4), 127-154.

Ministry of Education (2015). Practical Arts (Technology / Home Economics) / Information Subject Curriculum. Ministry of Education Notice No. 2015-74 [Appendix 10].

Przybylla, M., & Romeike, R. (2014). Physical Computing and its scope-Towards a constructionist computer science curriculum with physical computing. *Informatics in Education, 13*(2), 241-254.

Reigeluth, C. M. (1989). Educational technology at the crossroads: New mindsets and new directions. *Educational Technology Research & Development, 37*(1), 67-80.

Reigeluth, C. M. & Frick, T. W. (1999). A formative research: A methodology for improving theories and models of instruction. In C. M. Reigeluth (Ed.), *Instructional Design Theories and Models (Vol. II)*. New York: NY: Routledge.

Richey, R. & Nelson, W. (1996). Development research. In D. Jonassen (Ed.), *Handbook of Research for Educational Communication and Technology*. New York, NY: Macmillan.

Rose, D. H., & Meyer, A. (2002). *Teaching Every Student in the Digital Age: Universal Design for Learning*. Alexandria, VA: ASCD.

Song, U. S. & Gil, J. M. (2017). Development and application of software education program based on blended learning for improving computational thinking of pre-service elementary teachers. *KIPS Transactions on Software and Data Engineering, 6*(7), 353-360.

Spooner, F., Baker, J. N., Harris, A. A., Ahlgrim-Delzell, L., & Browder, D. M. (2007). Effects of training in universal design for learning on lesson plan development. *Remedial and Special Education, 28*(2). 107-116.

AN EXAMINATION OF HUMAN RESOURCES PROFESSIONALS' PERCEPTIONS ABOUT THE INTEGRATION OF E-LEARNING IN THE WORKPLACE

Ken Kiyohara, MBA, PhD
kiyohara@hawaii.edu
Hawaii Tokai International College
Kapolei, Hawaii, USA

This qualitative study was developed to examine the current environments in which workplace learning and e-learning in the service industry in Hawaii is developed and executed and how the HR professionals perceived the workplace learning environments. For this purpose, through the three research questions based on the conceptual framework, this study helped to gain insights to the perceptions of the HR professionals about the integration of workplace learning and e-learning in the service industry in Hawaii.

The results of qualitative analysis of seven participants' interviews uncovered that there are more than a few factors involved in delivering workplace learning regardless of delivery modes, which are cost of the training, cost of the labor during the training, staffing issues during the training, organizational objectives, employee goals and motivation, employees' technical competency, technological infrastructure, and learning objectives. Furthermore, it was also found that the challenges involving the workplace learning are complex and intertwined. The qualitative data suggests that the participants lack the knowledge of learning theories, institutional design models, education technologies and pedagogical or andragogical theories, needed to develop and support learning and to understand the current e-learning industrial environment.

Secondly, the negative cycle of dependency appears to be impacting the HR professionals as they even become more dependent upon their corporate headquarters on the US mainland or outsourced companies to develop workplace learning for the employees in Hawaii. These attitudes of dependency seem to create the culture among the HR professionals that they do not need to further their knowledge and education for the betterment of workplace learning. Overall, these two critical factors were uncovered to be impacting the effectiveness of workplace learning as "cultural relevancy" or "job relevancy" may not be appropriately and effectively incorporated into design of the workplace learning.

Nevertheless, the participants have been seeing changes in learning environment in the industry, workplace, and employees. As a consequence, e-learning in the form of online or hybrid delivery seemed to be expected more while face-to-face workplace learning would still remain for more specific learning purposes. Overall, the hybrid mode of workplace learning is preferred as a compromise to strike a balance between face-to-face and e-learning modes of workplace learning.

Key words: workplace e-learning, online learning, hospitality industry, service industry, human resources, Hawaii

INTRODUCTION

The business environment is increasingly challenged by global competition by such factors as rapid technological change, fast-changing market situations, constrained resources, and continuous demand for quality services (Damanpour & Aravind, 2012b). Technology is considered to be a source of competitive advantage and economic growth and a key determinant of corporate success, and thus worthy of study in both academic and practitioner communities (Damanpour, 2017). Kimiloglu, Ozturan & Kutlu, (2017) stated that corporate training is one of the main business functions in most organizations, yet the penetration of technology into the world of education is not prevalent only in an organizational context.

However, serious consideration has been given to the way they design and deliver workplace learning opportunities for their employees (Kimiloglu, Ozturan & Kutlu, 2017). The recent event of COVID-19 pandemic has increased the importance of e-learning as an effective alterative option to traditional face-to-face learning in various areas such as high schools, universities, adult education and lifelong learning programs, companies and organizations.

Although organizations are struggling to provide adequate e-learning opportunities for their workforce (Jia et al., 2011; Payne et al., 2009), e-learning provides a mechanism for learning that is independent from time or place, which might help serve the needs of the employees (Dawley & Dede, 2014; Oliver & Carr, 2009). Furthermore, workplace e-learning could enable organizations to provide effective learning environments to provide training for large numbers of employees (Jia et al., 2011; Payne, et al., 2009); e-learning has been also considered to be an opportunity for effective competency-based learning (Dawley & Dede, 2014; Oliver & Carr, 2009). However, there seem to be still limited workforce e-learning opportunities offered (Jia et al., 2011).

The second-largest industry in Hawaii is the service industry and thus was targeted for this study. Limited professional development opportunities are making it more challenging for the employees in Hawaii's service industry to be abreast with updated skills, knowledge and technological skills (Jia et al., 2011; Payne et al., 2009). Furthermore, the success of the corporations in the service industry depends largely on employees as to how they are recruited, managed, trained and educated through a process of continuing learning and career development (Kalbaska, Lee, Cantoni & Law, 2013). Although e-learning has been widely adopted in the service industry with other methods of training delivery (European Commission, 2001) as a means of increasing skills and providing knowledge, the levels of adoption differ significantly (Buhalis & Law, 2008).

The Washington Post (2013) stated that in particular, the hospitality sector of the service industry is the largest single contributor to the state's gross domestic product, representing about 21 percent of its entire economy in Hawaii. However, the hospitality sector has some unique challenges, since the organizations need to provide continuous training for employees working different shifts within the organizations, which operate twenty-four hours a day, seven days a week. More specifically, the complex nature of the hospitality industry appears to present unique challenges for HR professionals' training and education providers in terms of access, deliverability, time, and need (Kalbaska et al., 2013). In addition, constant change and uncertainty in the business environment of the hospitality industry creates a situation that requires all employees to learn continuously (Kalbaska et al., 2013), which has made it more difficult for corporate trainers to conduct face-to-face training sessions. This kind of situation can also apply to the service industry in general, as the nature of the business is similar; moreover, this unique situation would make the effective selection and implementation of e-learning more critical (Kalbaska et al., 2013).

There seem to be other factors that surround the workplace learning in the service industry. Taylor (2009) asserted that there are intertwined relationships that exist between retention and training. There are four critical elements for employee retention: 1) fair reward in alignment with market place, 2) recognition of employees, 3) training and improving skills, and 4) developing talented people (Taylor, 2009). As such, HR professionals become the key element for eventual success in business operations through training (Burma, 2014). Moreover, Ozcelik and Ferman (2006) suggested the importance of a competency approach as a core HR strategy. This would enable organizations to align employee behaviors and skills with the strategic direction of the organization as a whole. and ultimately lead to an organization's competitive advantage (Ozcelik & Ferman, 2006).

In particular, increasing the productivity of each employee, the greatest asset to an organization, is crucial to improve the competitiveness and quality of the organization (Stone et al., 2015). Huselid (1995) argued that the role of HR professionals is changing in such a way that their position in the areas of staffing and training is fundamental not only to maximize the productivity and efficiency of HR itself, but also to make the organization as a whole operate efficiently. It is argued that there is a positive correlational relationship between generating high-performance work practices, different ways of measuring employee performance, improving skills, and developing talented people (Huselid, 1995; Taylor, 2009; Burma 2014). In this regard, Ozcelik and Ferman (2006) suggested the significance of developing employee competencies as a core HR strategy, which would enable organizations to align employee behaviors and skills with the strategic direction of the organization as a whole. As a consequence, the function of HR management has evolved from more clerical roles in personnel management and industrial relations, to more strategic roles in terms of organizational efficiency and employee productivity (Burma, 2014; Ozcelik & Ferman, 2006).

Additionally, the workforce today is becoming more diverse in terms of gender, culture and

generations, posing new challenges in HR (Gratton & Scott, 2016; Oh & Reeves, 2014; Ogawa, 2015). Since the competitiveness of organizations depends on the effectiveness and productivity of the employees, it is critical to keep their skills and knowledge up-to-date and relevant to today's global business environment (Chen & Kao, 2012; Wang et al., 2011).

In this environment, the role that HR professionals play has become critical in determining and adopting learning opportunities in organizations. Therefore, this study sought to explore how HR professionals think about workplace e-learning as a strategy to meet the learning needs of their employees. Moreover, this study was designed to investigate the various factors affecting HR professionals regarding the workplace learning including e-learning and to attempt to gain insights in three main areas: (1) how they make decisions to adopt e-learning, (2) what factors influence their decisions, and (3) how they perceive the effectiveness of e-learning. In particular, this study utilized a conceptual framework focusing upon four variables—strategic, individual, structural and organizational—to understand what factors HR professionals may think important or unimportant in relation to workplace learning and e-learning.

RESEARCH DESIGN & METHODS

The Qualitative Study Framework

The purpose of this qualitative study was to analyze seven transcriptions of interviews conducted with HR professionals in Hawaii's service industry, using a conceptual framework to understand their perceptions regarding various aspects of workplace e-learning for their employees. Three research questions were investigated to inform the overarching themes that fall within the conceptual framework of the study. Moreover, the choice to use an organizational adoption of technology framework focusing on the industry leader status of the participants is discussed. My research questions are:

(1) How do HR professionals in the organizations make decisions regarding workplace e-learning for their employees?
(2) What factors do they consider in making decisions regarding workplace e-learning for their employees? And,
(3) How do they perceive the effectiveness of e-learning for their employees?

This research employed qualitative methods utilizing (a) semi-structured interviewing; (b) open coding and thematic analysis; and (c) descriptive techniques as recommended in the literature (Ary, Jacobs, Sorensen, & Walker, 2014; Bryman, 2012; Yin, 2008). **Utilizing a qualitative study with interpretive methods is appropriate to describe and interpret a phenomenon or process (Ary et al., 2011), such as examining HR professionals' understanding of and perceptions about e-learning within organizations. In essence, an interpretive approach to qualitative study will understand events, processes, and activities from the perceptions of the participants, and** identify recurrent patterns or themes (Ary et al., 2011).

This research followed a qualitative approach developed by Vogelsang, Steinhüser & Hoppe (2013). The first phase of this study involved (1) defining research questions, and (2) defining groups of interest and choosing interviewees. Also, the interviews were conducted on such a way that involved (1) conducting oral interviews, (2) recording the interviews, and (3) transcribing the interviews. For the following phases, an analysis of interview transcriptions and interpretive approaches to qualitative descriptions was conducted (Vogelsang et al., 2013).

Moreover, these research methods were appropriate to collect and analyze data within qualitative interpretative methodology (Mallat, 2007). Although Mallat utilized focus group interviews for his explorative studies, he determined that the feasibility of his qualitative approach was appropriate for organizational adoption of mobile payment systems. In a similar fashion, this qualitative approach is appropriate for this explorative study of organizational adoption of workplace e-learning. As mentioned earlier, there is a lack of research to comprehend how HR professionals perceive and understand workplace learning. This exploratory research is designed to find insights that would help develop more effective workplace learning and e-learning in the service industry of Hawaii.

Participants and Context

In conducting this qualitative study, purposive sampling procedures were employed to interview

seven HR professionals from various organizations. These numbers are considered to be appropriate, since the literature demonstrates that saturation will be reached at between six and twelve interviews (Guest, Bunce & Johnson, 2006). Purposive sampling is also known as judgmental, selective, or subjective sampling (Bryman, 2012), and is considered to be a non-probability sample, with the sample population selected based on characteristics of a population and the objective of the study. Purposive sampling was adopted for this study because HR professionals were interviewed based on their involvement in workplace learning in the service industry. More specifically, the HR professionals who were selected held a management position, and had more than five years of experience in the area of development and implementation of workplace learning and e-learning in Hawaii's service industry.

Based on the Interview Protocol, a convenient location and time for the interviewee to undertake the interview was decided. Following the introductions, information about informed consent, and IRB permission was explained in detail, including confidentiality, no intention of harm, rights, and freedom from prejudice if he/she decides to withdraw from the study. Furthermore, consent to audio record the interview was also secured. When considering the interview sites, a number of factors were considered. According to Damanpour & Aravind (2012b), small organizations are more likely to be innovative in some circumstances because of their more responsive environment for making quicker decisions as well as to be more flexible in accepting and implementing change. On the other hand, large organizations are more likely to be innovative in some circumstances due to their larger financial and technical capabilities, the economies of scale to spread the risk of failure and absorb the costs of innovation, and resources to hire professional and skilled workers in diverse disciplines.

Moreover, according to Kimiloglu et al. (2017), companies with different employee sizes demonstrate a significant difference in terms of the perceived importance related to the organizational disadvantages of conducting e-learning for workplace e-learning. So for this study, companies were grouped into three categories: "below 500 employees", "500-2,000", and "above 2,000". Typically, according to Kimiloglu et al. (2017), companies with less than 500 employees may not experience major organizational challenges with integration of technologies, since the amount of investment to develop and implement technologies such as e-learning will be limited. Companies with 500-2,000 employees may experience relatively greater organizational difficulties compared to the other two groups. As a comparison, large scale companies with over 2,000 employees can be expected to have the necessary financial resources and managerial support to make the extensive investment needed for e-learning. Thus, organizations with a medium employee population of 500-2,000 have indicated the highest concern with regard to company-wide challenges. Therefore, for the purpose of this study, small to mid-sized organizations in Hawaii were surveyed.

Instrumentation and Procedures

The purpose of this study was to gain insights as to how HR professionals choose whether or not to adopt e-learning opportunities in the workplace in Hawaii's service industry. This research employed research methods utilizing survey and interview questions. Typically, semi-structured interview questions were employed to gain insights to the core of the research questions (Yin, 2008). The participants were asked open-ended questions to discuss how and why they perceived certain modes or types of workplace learning including e-learning, what factors they considered important in selections, and how they perceived the variables.

As the issue of self-reporting has been covered in the literature (Neyland, 2008; Bryman, 2012), I asked questions of a similar nature in multiple ways with different interview questions. This would help detect any discrepancies of answers by self-reporting. In an attempt to avoid any issues caused by self-reporting, an interview protocol was developed to ensure the reliability of the outcomes of the interviews. Neyland (2008) mentions three types of questions for interviews, which are (1) descriptive, (2) structural, and (3) contrast questions. Also, Campbell & Lassiter (2014) assert that the interviewers may use different kinds of interviews and interviewing techniques such as (1) structured, (2) semi-structured, and (3) unstructured questions. Although narration or conversation to open new lines of inquiry was encouraged, semi-structured interviews proceeded from an established set of questions, as control and authority are more likely to be shared (Neyland, 2008). Furthermore, semi-structured interviews are more common in ethnographic research, where both formal and informal communication need to take place in the context of doing fieldwork (Campbell & Lassiter, 2014). Therefore, my study utilized semi-structured interviews an interview guide as suggested by Neyland (2008).

Some of the problems which required careful management in association with interviewing were

as follows: (1) questions of researcher influence, (2) becoming too closely involved with research subjects, (3) the time and cost of interviewing, (4) epistemological issues along with gender, (5) ethnicity, (6) age, and (7) background of the interviewer (Neyland, 2008). Ybema, Yanow, Wels and Kamsteeg (2009) stated that one of the difficulties is distinguishing between what people say they do and what they actually do.

Data Collection

As described earlier, this research followed the modified qualitative approach developed by Vogelsang et al. (2013). Phase one of this study involved defining the research question. Phase two was conducting, recording, and transcribing interviews. Phase three involved analysis of interview transcriptions and phase four utilized an interpretive approach to develop qualitative descriptions (Vogelsang et al., 2013). This study utilized purposive sampling that focused upon HR professionals with at least three years of experience in the HR area and experience in workplace learning. Initially, the Society of Human Resources Management (SHRM), the Office of Continuing Education and Training (OCET) at Kapiolani Community College, and the Association of Talent Development (ATD), were contacted for possible recommendations for potential interviewees. However, viable leads were obtained only through my personal contacts at ATD. Once potential interviewees were identified, e-mail and/or phone communication were followed to solicit participation. The selection process was conducted through the initial communication with the potential selectees.

When applicants were considered qualified to be interviewed for the study, they were interviewed according to an interview protocol in order to increase the reliability of research (Yin, 2008). The issues of ethics were addressed by disclosing my positions and potential biases, and by protecting the participants through carrying out informed-consent procedures, protecting their privacy, and anonymizing the reporting (Cresswell, 2007). Based on the protocol, the session began with an introduction by the interviewer and an explanation of the overall objectives of the interview, followed by a check securing understanding and consent. Following the introductions, information about informed consent and IRB permission were explained in detail, including items such as confidentiality, no intention of harm, rights, and freedom from prejudice if he/she decided to withdraw from the study.

The interviews lasted approximately an hour and were documented using a digital recorder on iPhone, with backup performed on QuickTime Player on MacBook Air. The session was recorded for audio only with no names or video of the participant used. Consequently, the recorded interviews were transcribed by utilizing Temi and published using a standardized dictation format with Microsoft Word. The transcriptions were then coded with MAXQDA software, which creates codes during the excerpt identification process. The coding follows the qualitative clustering method, such as grouping and then conceptualizing excerpts that have similar patterns or characteristics. Moreover, the coded segments included specific words, themes or issues that commonly occurred within and across the interviews. Moreover, the inter-rater validity was examined by having a third person use the same codes and apply them to a sample transcription.

Data have been securely stored for confidentiality on a computer protected by a password that only the researcher has access to. The recording was transcribed by the interviewer only and will be destroyed once the study is completed. For accuracy, the complete transcript was emailed to the interviewee for review, providing the researcher a chance to go back and discuss the transcripts to determine whether the contents seemed accurate to those who participated in the research.

Data Analysis

As mentioned previously, the interviews were transcribed by utilizing Temi, an online software program, and coded with MAXQDA that created codes during the excerpt identification process. Transcriptions of the interviews were published with Microsoft Word and the completed transcripts were imported into MAXQDA, which then identifies excerpts from the transcript while highlighting the codes. For sections requiring more than one code, multiple labels were coded. Furthermore, codes were combined as needed to create new categories. The data were analyzed through open coding, and under each variable (strategic, individual, structural and organizational) sub-themes were identified as to which research question each sub-theme informs. Open coding and identifying recurring themes are the two most common analysis techniques in qualitative research (Ary et al., 2011).

Some of the sub-themes were found to be significant and therefore serve to provide insights into each of the three research questions (Bryman, 2012). The data, which were shown as narratives and

through the coding process, would emerge in regards to how HR professionals perceived workplace learning and e-learning, what factors they considered in their decision-making, and how they perceived the effectiveness of workplace learning and e-learning. Based on synthesized descriptions of the coded interview transcriptions, further discussions and analyses were developed, which informed the three research questions. As this study is meant to be an explorative study, finding insights through thematic analysis utilizing the conceptual framework is considered to be important. Overall, the results yielded by the qualitative analysis of interviews revealed insights to workplace learning, particularly its impact on selection and implementation of workplace e-learning.

A member check for the transcriptions were performed to confirm accuracy by sharing the complete transcripts with the interviewees for review. Performing a member check was important to verify the details of transcriptions, to make any necessary changes as the interviewees saw necessary, and to ensure that their anonymity is protected and no details of the organizations would be disclosed by accident.

RESULTS

This qualitative study examined the perceptions of HR professional regarding e-learning for their employees in the workplace in the service industry in Hawaii. It appeared that at present, face-to-face workplace learning was still a common delivery method and appropriate for certain groups of employees. However, the participants saw changes in learning environments in the industry, workplace, and employees. As a consequence, e-learning in the form of online or hybrid modes seemed to be expected to be more commonly utilized in the near future, while face-to-face workplace learning would still remain for more specific learning purposes. Overall, because of the busy life that the employees have, the hybrid mode of workplace learning is preferred as a compromise between face-to-face and e-learning modes.

From the interviews, it was found that the challenges involving workplace learning are complex and intertwined. There were more than a few challenges in development and implementation of workplace learning in organizations regardless of the delivery mode. The open coding and overall analysis of data from the interviews have provided rich information and valuable insights into the perceptions of the HR professionals involved in development and delivery of workplace learning. From the seven qualitative interviews, it was observed that there are more than a few conditions for delivering workplace learning in organizations in general regardless of delivery modes. These include the cost of the training, the cost of the labor during the training, staffing issues during the training, organizational objectives, employee goals and motivation, employees' technical competency, technological infrastructure, and learning objectives.

Many of the issues that were discussed by the participants appear to indicate their lack of knowledge of learning theories, institutional design models, education technologies and pedagogical or andragogical theories, which are needed to develop and support learning and to understand the current e-learning industrial environment. Also, HR's attitudes of dependency on the corporation to create a culture where HR does not feel the need to further their knowledge and education for the betterment of workplace learning. These two critical factors influenced by HR professionals might well be impacting the effectiveness of workplace learning. Essential learning outcomes such as "cultural relevancy" or "job relevancy" may not be appropriately and effectively incorporated into design of the workplace learning in the service industry in Hawaii.

There appears to be a negative cycle of dependency, where the HR professionals are not developing their workplace learning by themselves. Instead, they are depending upon their corporate headquarters on the US mainland or outsourced companies for development of workplace learning for their employees in Hawaii. Due to this vicious circle, it appears that the HR professionals may not be so involved in the decision-making regarding the integration of e-learning in the workplace in the service industry. As a consequence, there seems to be a conflict between responsibility and authority within the organization. This conflict seems to derive from the lack of decision-making authority even if they wanted to be more involved in development of workplace learning. They feel responsible for development and implementation of effective workplace learning and their frustration about lacking the authority to decide on e-learning in the workplace was demonstrated during the interviews. Thus, this vicious cycle of dependency needs to be broken before this conflict could be resolved among the HR professionals and the employees in the service industry could receive more effective workplace learning that is developed and executed by the HR professionals in Hawaii.

REFERENCES

Ary, D., Jacobs, L. C., Sorensen, C. K., & Walker, D. A. (2014*). Introduction to Research in Education* (9th ed., pp. 205-252). Boston, MA: Cengage Learning.

Bryman, A., (2012). *Social Research Methods.* New York, NY: Oxford University Press.

Burma, Z.A. (2014). Human Resource Management and Its Importance for Today's Organizations. *International Journal of Education and Social Science 1*(2). Retrieved from www.ijessnet.com

Cantoni, L., Kalbaska, N., & Inversini, A. (2009). E-learning in tourism and hospitality: A map. *Journal of Hospitality, Leisure, Sports and Tourism Education (Pre-2012)*, *8*(2), 148.

Chen, H. J., & Kao, C. H. (2012). Empirical validation of the importance of employees' learning motivation for workplace e-learning in Taiwanese organisations. *Australasian Journal of Educational Technology*, *28*(4), 580-598.

Cresswell, A. (2007). Getting to "know"connectors? Evaluating data-driven learning in a writing skills course. *Corpora in the Foreign Language Classroom* (pp. 267-287). Brill Rodopi.

Damanpour, F. (2017). Organizational Innovation. Retrieved from the *Oxford Research Encyclopedia, Business and Management*. Online Publication Date: Aug 2017 DOI: 10.1093/acrefore/9780190224851.013.19

Damanpour, F., & Aravind, D. (2012b). A review of research on organizational structure and innovation: From organic to ambidextrous structure. In M. D. Mumford (Ed.), *Handbook of Organizational Creativity* (pp. 483–513). Boston: Academic Press.

Dawley, L., & Dede, C. (2014). Situated learning in virtual worlds and immersive simulations. In Spector, J. M., Merrill, M. D., Elen, J. & Bishop, M. J., *Handbook of Research for Educational Communications and Technology* (4th ed.), 723-734. New York, NY: Springer. doi 10.1007/978-1-4614-3185-5

European Commission. Directorate-General for Employment. (2001). *Promoting a European Framework for Corporate Social Responsibility: Green Paper*. Office for Official Publications of the European Communities.

Gratton, L., & Scott, A. (2016). *The 100-year Life: Living and Working in an Age of Longevity*. Bloomsbury Publishing.

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Sage Journals, 18*(1), 59-82. Retrieved from https://doi-org.eres.library.manoa.hawaii.edu/10.1177/1525822X05279903

Huselid, M.A. (1995). The impact of human resource management practices on turnover, productivity, and corporate financial performance. *The Academy of Management Journal 38*(3), 635-672.

Jia, H., Wang, M., Ran, W., Yang S.J.H., Liao, J., & Chiu, D.K.W., (2011). Design of a performance-oriented workplace e-learning system using ontology. *Expert Systems with Applications 38*(4), 3372-3382. doi:1016/j.eswa.2010.08.122

Kalbaska, N., Lee, H. A., Cantoni, L., & Law, R. (2013). UK travel agents' evaluation of e-learning courses offered by destinations: An exploratory study. *Journal of Hospitality, Leisure, Sport & Tourism Education*, *12*(1), 7-14.

Kimiloglu, H., Ozturan, M., & Kutlu, B. (2017). Perceptions about and attitude toward the usage of e-learning in corporate training. *Computers in Human Behavior*, *72*, 339-349

Mallat, N. (2007). Exploring consumer adoption of mobile payments–A qualitative study. *The Journal of Strategic Information Systems*, *16*(4), 413-432.

Neyland, D. (2008). *Organizational Ethnography*. Thousand Oaks, CA: Sage Publications.

Ogawa, Michael-Brian C. (2015). Interactions and innovation in educational on-line communities. Retrieved from http://etec.Hawai'i.edu/proceedings/2015/ogawa.pdf

Oh, E., & Reeves, T.C. (2014). Generational Differences and the Integration of Technology in Learning, Instruction, and Performance. In Spector, J. M., Merrill, M. D., Elen, J. & Bishop, M J. (Eds) (2014). *Handbook of Research for Educational Communications and Technology* (4th edition). (pp. 819-828) New York, NY: Springer. doi: 10.1007/978-1-4614-3185-5

Oliver, M., & Carr, D. (2009). Learning in virtual worlds: Using communities of practice to explain how people learn from play. *British Journal of Educational Technology, 40*(3), 444-457. doi: 10.1111/j.1467-8535.2009.00948.x Retrieved from http://edtc6325group2.pbworks.com/f/Learning_in_VirtualWorlds.pdf

Ozcelik, G. & Ferman, M. (2006). Competency approach to human resources management: Outcomes and contributions in a Turkish cultural context. *Human Resources Development Review 5*(1), 72-91.

Payne, A. M., Stephenson, J. E., Morris, W. B., Tempest, H. G., Mileham, A., & Griffin, D. K. (2009). The use of an e-learning constructivist solution in workplace e-learning. *International Journal of Industrial Ergonomics, 39*, 548-553.

Stone, D. L., Deadrick, D. L., Lukaszewski, K. M., & Johnson, R. (2015). The influence of technology on the future of human resource management. *Human Resource Management Review*, *25*(2), 216-231.

Taylor, J. C. & Stern, Gary M. (2009). *The trouble with HR: An insider's guide to finding and keeping the best talent.* American Management Association: New York, p.65.

Vogelsang, Kristin & Steinhueser, Melanie & Hoppe, Uwe. (2013). A Qualitative Approach to Examine Technology Acceptance. International Conference on Information Systems (ICIS 2013): Reshaping Society Through Information Systems Design.

Wang, M. (2011). Integrating organizational, social, and individual perspectives in Web 2.0-based workplace e-learning. *Information Systems Frontiers 13*(2), 191-205. doi: 10.1007/s10796-009-9191-y

Ybema, S., Yanow, D., Wels, H. and Kamsteeg, F. (Eds) (2009). *Organizational Ethnography: Studying the Complexities of Everyday Life.* Thousand Oaks, CA: Sage Publications.

Yin, R. K. (2008). *Case Study Research: Design and Methods* (4th ed.). Los Angeles, CA: SAGE.

A Study on Development of An Instructional Design and Technology Class and Instructional Designs of Pre-Service Teacher-Training Students

Kento NAKAMURA
1720515@ed.tus.ac.jp
Master student
Department of Mathematics and Science Education, Graduate School of Science,
Tokyo University of Science
Tokyo, Japan

Tadashi MISONO
misono@edu.shimane-u.ac.jp
Associate professor
Institute of Education, Academic Assembly, Shimane University
Matsue, Japan

Yuki WATANABE
wat@rs.tus.ac.jp
Associate professor
Department of Mathematics and Science Education, Graduate School of Science,
Tokyo University of Science
Tokyo, Japan

The Ministry of Education, Culture, Sports, Science and Technology summarized the skills required in the pre-service teacher-training course of all Japanese universities in a document titled "A Core Curriculum of Pre-service Teacher-Training Course." In this core curriculum, pre-service teacher-training course classes are divided into several domains. One of these, "subjects related to instructional design and technology (IDT)", aims for understanding fundamental theories and practices of instructional design (ID). The purpose of this research is to improve the IDT course and lesson plans of pre-service teacher-training students. To accomplish this purpose, we conducted two studies. Participants are pre-service teacher-training student in A University taking an IDT course. They designed pre- and post-lesson plans for their specific subject and answered pre- and post-questionnaire. The first research observed the limitation of just giving instruction of the ID theories and methods. Then, in the second research, in response to this limitation, we revised the template of the lesson plans and provided the checklist of each perspective of lesson plans. As a result, the number of applying the consistency of objective, content, and assessment, Gagné's nine events, and the ARCS model mainly increased compared to the first research.

***Key words*:** Instructional Design, Teacher Education, Pre-service Teacher-Training Course

1. INTRODUCTION

In Japan, the Central Council for Education (2016) considers the new curriculum guidelines which are to take effect in junior high schools in 2021 and in high schools in 2022, as based on the following three pillars: (1) what students will be able to do, (2) what they will be able to learn, and (3) how they will

be able to learn it. Particularly, the last item implies improvements in giving instruction from the active learning point of view. In response to these needs, the Ministry of Education, Culture, Sports, Science and Technology (2017) summarized the skills required in the pre-service teacher-training course of all Japanese universities in a document titled "A Core Curriculum of Pre-service Teacher-Training Course."

In this core curriculum, pre-service teacher-training course classes are divided into several domains. One of these, "subjects related to instructional design and technology (IDT)", aims for understanding fundamental theories and practices of instructional design (ID). Suzuki, Nishibuchi, Yamamoto, and Keller (2004) state that ID models are practical summing of psychological as well as other researches, for helping those who create educational and training materials. Specifically, in an Instructional Design and Technology (IDT) course at A University, pre-service teacher-training students learn three fundamental Instructional Design (ID) theories. The first theory emphasizes consistency regarding objective, content, and assessment. Teaching activities are revised and improved by confirming what students will be able to do, how to judge whether they will learn, and how to support their learning. The second theory is the theory of Gagné's nine events of instruction (Gagne 1974). The last theory is the attention, relevance, confidence, and satisfaction (ARCS) model (Keller 2009). This model is related to learners' motivations.

The purpose of this research is to improve the IDT course and lesson plans of pre-service teacher-training students. To accomplish this purpose, we conducted two studies.

2. RESEARCH 1

2.1. Research Design and Methods

The research participants consisted of 65 pre-service teacher-training course students taking a face-to-face IDT course at the Faculty of Science, A University. Their specific subjects was mathematics, physics, and science. The course was held from September to November 2019 (see **Figure 1**).

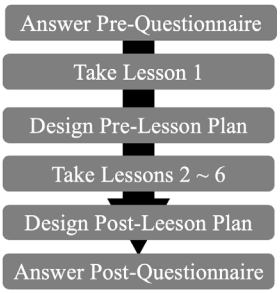


Figure 1. Flow of research 1

2.1.1. Learning Content

Table 1 shows the learning content of the IDT course.

Table 1. Learning Content of the IDT course

Title	Concrete Content
Introduction	Educational Technology, Technological Pedagogical Content Knowledge.
Design Instructions	ID, Gagné's five types of learning outcome, Gagné's nine events of instruction
Active Learning	21st Century Skills, Active Learning
ID considering student motivation	ADDIE model, ARCS model
Learning Environment	learning space, activity, and community
The consistency of objective and assessment method	teaching objective, the way of assessment
Instructional Media	history of instructional media, practical use of ICT

2.1.2. Measurements in the Questionnaire

ID Motivation

We created 24 items of ID Motivation for pre-service teacher-training course students with reference to a six-level definition of learning experience (Parrish and Wilson 2008) using a 5-point Likert scale ranging from 1 “I don’t think so” to 5 “I think so.” Each level has four items (e.g., “I am interested in the content of ID” for level 1).

Teacher Efficacy

We quoted seven items related to subject instruction from the teacher efficacy scale for the Faculty of Education (Igarashi, Miyauchi, and Yamada 2018) using a 5-point Likert scale, ranging from 1 for “I don’t think so” to 5 for “I think so” (e.g., “I can teach in a way that is easy to understand”).

Change of ID Motivation

In the post-questionnaire, we asked whether students changed ID motivation, using a 5-point Likert scale ranging from 1 for “declined” to 5 for “increased.” Then, we asked why they answered as they did both from the perspective of their own motivations and environmental causes.

2.1.3. Lesson Plans

We created a template for lesson plans. Participants designed pre- and post-lesson plans for their specific subject (mathematics, physics, and chemistry). There was room for writing about that day’s learning unit, objective, and detailed plan (learning content and learning activities, and instructional mindfulness and assessment point of view for each activity).

The lesson unit they designed was “Trigonometric Ratio” in mathematics I for mathematics, “Motion of Wave and Medium” in basic physics for physics, and “Substances composed of Ionic Bonds and Ions” in basic chemistry for chemistry.

2.1.4. Assessment of Lesson Plans

Two evaluators from the educational technology laboratory assessed the students’ lesson plans from four perspectives and developed a checklist for each perspective by referring to previous research.

Consistency of objective, content, and assessment

We evaluated the consistency in three steps:

1) Objective Step
   That day’s learning objective was written using behavioral verbs (e.g., “write,” “select”).
2) Assessment Method Step
   The evaluation method used the same learning type as the objective (e.g., verbal information)
3) Assessment Criterion Step
   The evaluation criterion was a rubric, and the goal was met when the highest standard was achieved.

The value of each step was one when it satisfied each criterion.

Integration of Gagné’s nine events of instruction theory

We developed checklists for each level of Gagné’s nine events by referring to Suzuki (1995), for example, “Use questions, contradictions, or facts that overturn the learners’ knowledge so as to stimulate their intellectual curiosity” and three other items for the first event, “Gain learner’s attention.”

The value of the event was set to one if at least one check was on the checklist of the event, and zero if none was available.

Integration of the ARCS model

We developed checklists for each domain of the ARCS model (Attention, Relevance, Confidence, and Satisfaction) by referring to Keller (2009). For example, we asked, “Are there references to specific

people rather than mankind, people or other such abstractions?" We asked about 16 items for the domain of "Attention"

Each domain was evaluated for at least one check in each criterion.

Defective Descriptions of Lesson Plans

We defined two categories of defective descriptions of lesson plans by referring to Kasai, Nagano, and Nuziguchi (2016). The first category, "loss of method description," describes the intent of an activity but does not describe the method of the activity. The second category, "unclear intention," describes the content and methods of the activity but does not describe the intent of the activity. The value of each category is the number of its description(s) of the activity.

2.2. Results

Forty-three participants answered questions about both pre- and post-questionnaires and pre- and post-lesson plans. From these, we chose 18 students specializing in mathematics in order to focus on mathematics.

2.2.1. Qualities of Lesson Plans

To confirm qualitative changes in students' lesson plans, we used the McNemar Test for each of the following steps: consistency of objective, content, and assessment. As a result, the number of lesson plans satisfied in (1) objective step (χ^2=3.00, p<.10) increased. Seventy-two percent of students satisfied this step in post-lesson plans. On the other hand, (2) the assessment step (χ^2=0.33, n.s.) and (3) the assessment criterion step did not increase. No one accomplished the third step in the post-lesson plans.

Moreover, each item was not normally distributed according to the Shapiro−Wilk Test. We used the Wilcoxon Rank Test to determine the total number of Gagné's nine events, the ARCS model, and two categories of defective description of lesson plans. As a result, the number of Gagné's nine events (W=7.00, n.s., r>.50) and the ARCS model (W=2.00, n.s., r=0.50) did not increase. In addition, the loss of method description did not change (W=2.00, n.s., r>.50), but unclear intention in the lesson plans (W=3.50, p<.05, r>.50) increased.

2.2.2. Motivation

In order to discuss changes in ID motivation, we used the Wilcoxon Rank Test to discuss changes of "ID Motivation" items. As a result, the item "ID is interesting" (W=15, p<.10, r>.30) increased.

Items "I have opportunities to improve ID through other students' feedback" (W=54.00, p<.10, r>.50) and "Through designing instructions, I want to become a teacher and play an active role at the school as soon as possible" (W=32.00, p<.05, r>.10) decreased.

3. Research 2

In response to the results and discussion of research 1, we redesigned the method of the IDT course.

In research 2, participants consisted of 138 pre-service teacher-training course students taking online IDT courses in the Faculty of Science and Faculty of Industrial Science and Technology, A University. Their specific subject was Mathematics, Physics, Science, and Biology. The course was held from May to July 2020. The research flow was almost the same as that of research 1.

3.1. Research Design and Methods

We changed two main perspectives in response to the results and discussion of research 1: (1) we provided checklists of ID theories and models, and (2) we redesigned a template of lesson plans.

3.1.1. Learning Content

We largely did not change the learning content of the IDT course. However, we provided checklists of each perspective on ID theories and models in response to the less integrated of Gagné's nine events and the ARCS model, and the consistency of objective, content, and assessment. For example, after

learning the ARCS model, participants would be provided a checklist of the ARCS model to integrate this model with their lesson plans.

3.1.2. Measurements in the Questionnaire

ID Motivation, Teacher Efficacy was the same as in research 1.

Teaching Experience

We made one item of "Teaching Experience (ID Motivation) Level" by referring to Learning Experience Level (Kawamoto et al. 2018).

Specifically, this 6-point Likert scale was from 1 "I am not interested in the content of this lesson, and this lesson is useless for designing instructions" to 6, "ID is important in the life, and I am happy to design instructions imaging at the school."

Self-Regulated Learning Strategy

We quote 24 items of self-regulated learning strategy scales (Hatano, Oikawa, and Hanzawa 2011) using a 5-point Likert scale.

3.1.3. Lesson Plans

We changed the template of the lesson plans. In that day's plan area, we added three rows for each activity in that day's lesson: (1) "intention of the activity," (2) "a number of Gagné's events of instruction" (e.g., two for the second event "Inform Students of the Objectives"), and (3) "A category of ARCS model" (e.g., A for "Attention") so that evaluators can understand the intention of its activity,

In research 2, participants designed not only pre- and post-lesson plans but completed six lesson plan assignments.

3.1.4. Assessment of Lesson Plans

Two evaluators from the educational technology laboratory assessed the students' lesson plans from three perspectives using the same checklist developed in research 1. A perspective of defective description was excluded from the assessment because the template of the lesson plan had changed.

3.2. Result

118 participants answered both pre- and post-questionnaire and pre- and post-lesson plans. From them, we chose 56 students specialize in mathematics in order to focus on mathematics.

3.2.1. Qualities of Lesson Plans

First, it was compared that the quality of pre-lesson plans of participants of research 1 and those of research 2. As a result, the last step of the consistency "assessment criterion" level was the same. Moreover, A total number of Gagné's nine events of instruction ($U=479.00$, n.s., $r>.10$) and the ARCS model ($I=390.00$, $p<.100$, $r>.50$) integrated to their pre-lesson plans have no significant difference. Therefore, we can say that two groups of participants have the same level of designing instructions before the course.

Then, to confirm qualitative changes in students' lesson plans, we used the McNemar Test for each of the following steps: consistency of objective, content, and assessment. As a result, the number of participants satisfy (1) objective step ($\chi^2=25.00$, $p<.001$) increased to 61%. Moreover, the number of participants satisfy (2) assessment step ($\chi^2=16.00$, $p<.001$) increased to 36%. However, participants (3) assessment criterion step ($\chi^2=1.60$, n.s.) did not increase (remained to be 14.3% in post-lesson plans).

The number of Gagné's nine events ($W=9.50$, $p<.001$, $r>.50$) and the ARCS model ($W=0.00$, $p<.001$, $r>.50$) increased. Focusing on each events of Gagné's nine events, first event "gaining attention" ($\chi^2=10.00$, $p<.010$), second event "informing learners of the objective" ($\chi^2=12.00$, $p<.001$), third event "stimulating recall of prior learning" ($\chi^2=14.00$, $p<.001$), and eighth event "assessing performance" ($\chi^2=7.00$, $p<.010$) increased in post-lesson plans. Focusing on each perspective of the ARCS model, "attention" ($\chi^2=6.00$, $p<.050$), "Relevance" ($\chi^2=12.00$, $p<.001$), and "Confidence" ($\chi^2=5.00$, $p<.050$) increased in post-lesson plans.

4. CONCLUSION

In this research, we conducted two studies aiming at improving IDT course. The first research observed the limitation of just giving instruction of the ID theories and methods. Then, in the second research, in response to this limitation, we revised the template of the lesson plans and provided the checklist of each perspective of lesson plans. As a result, the number of applying the consistency of objective, content, and assessment, Gagné's nine events, and the ARCS model mainly increased compared to the first research. However, we have to consider more on the motivation or teacher efficacy to the quality of lesson plans of pre-service teacher-training students.

REFERENCES

Central Council for Education. (2016). Youchien, Shou Gakkou, Chu Gakkou, Koutou Gakkou Oyobi Tokubetsu Shien Gakkou no Gakusyu Shidou Youryou Tou no Kaizen Oyobi Hitsuyou na Housaku Tou ni Tsuite. https://www.mext.go.jp/b_menu/shingi/chukyo/chukyo0/toushin/1380731.htm (accessed 2020.07.31) (in Japanese)

Gagne, R. M., & Briggs, L. J. (1974). Principles of instructional design. Holt, Rinehart & Winston.

Hatano, K., Oikawa, M., & Hanzawa, R. (2011). An Attempt to Create A Self-Regulated Learning Strategy Scale for University Students. Annual convention of the Japanese Association of Educational Psychology, 53, 325. (in Japanese)

Igarashi, R., Miyauchi, T. & Yamada, H. (2018) Changes in Teacher-efficacy and Anxiety towards Practice-teaching of Student Teachers through Practice-teaching and Preparatory-training, Journal of The Human Development Research, 8, 67-78. (in Japanese)

Kasai, T., Nagano, K. & Mizoguchi, R. (2016). A Practical Use of Visualizing Lesson Structures to Enhance Skills to Design Instructions in Teacher Training Education and Its Effect. SIG-ALST, 5(03), 70-75. (in Japanese)

Kawamoto, H., Watanabe, Y. & Hidaka, K. (2018). Primary Factors that Influence Learning Experience in Higher Education. Japan Society for Educational Technology, 41(4), 363-374. (in Japanese)

Keller, J. M. (2009). Motivational design for learning and performance: The ARCS model approach. Springer Science & Business Media.

Ministry of Education, Culture, Sports, Science and Technology. (2017). Koyusyoku Katei Koa Karikyuramu. https://www.mext.go.jp/b_menu/shingi/chousa/shotou/126/houkoku/1398442.htm (access ed 2020.07.31) (in Japanese)

Parrish, P. and Wilson, B. G (2008). A design and research framework for learning experience, A paper presented at the 31st Annual Convention of the AECT, Orlando, FL.

Suzuki, K. (1995). Housou Riyou karano Jugyou Dezeina- Nyumon. Nippon Housou Kyouiku Kyoukai. (in Japanese)

Suzuki, K., Nishibuchi, A., Yamamoto, M., & Keller, J.M. (2004). Development and evaluation of Website to check instructional design based on the ARCS Motivation Model. Information and Systems in Education, 2 (1): 63-69

Suzuki, K. (2008). Instructional Design no Kiso Toha Nanika: Kagaku tekina Oshiekata Heno Osasoi. Syoubou Kenshu. 84. 52-68. (in Japanese)

The Pathways to the Profession of Faculty Mentors through Collaborative Experiences in Higher Education

Yukari KATO
kathy@tmu.ac.jp
Professor
Tokyo Metropolitan University
Tokyo, Japan

This study examines the awareness of faculty mentors though mentoring experiences with their mentees at the three-day intensive teaching portfolios workshop. Data arising from discussions with and reports from 12 mentors at the final mentor meeting were recorded and analyzed using a qualitative data analysis method known as the Steps for Coding and Theorization method (SCAT). In total, 198 units were extracted from the transcripts of the final meetings held on September 12, 2019. The analysis revealed the following three points: (1) mentors indicated that they could not know how to advise their mentees effectively so that their mentees did not change and revise their teaching portfolios; (2) mentors were hesitated to give advices on how to revise their manuscript to their mentees because of the different background and teaching styles between them; (3) mentors were inspired by other mentors' actual expertise and mentoring style which were shared in mentor meetings.

Key words: Faculty Learning, Professional Development, Teacher Learning, Qualitative Research, Faculty Growth

INTRODUCTION

In the research field of professional development, one area that has started to receive greater attention is the study of professional developers themselves, the matter by which they learn about, enter into, and progress with the field (McDonald, 2010). Fraser et al. (2010) suggested that the field of professional development should learn more about adult professional theory, professional socialization of academics, and how their careers are structured to support academics in their personal and professional development. There has also been a shift in the role of professional developers, moving from support for teaching needs of individual faculty to a broad range of services, programs, and initiatives at institutional levels within post-secondary education (McDonald, 2010).

Since 2009, the Osaka Prefecture University College of Technology has conducted an intensive three-day seminar guided by mentor faculty to create teaching portfolios. It is designed to engage mid-career faculty members in teaching and learning theory, practice, and scholarship and establish and support a faculty community of practice that provides mentorship and leadership in higher education (Kato, 2013; Kato, 2014; Kato et al., 2018; Kato, 2019). Faculty participants enrolled in this seminar reflect on their own teaching practices through the creation of a teaching portfolio. At the same time, faculty mentors get opportunities to consult with a supervisor with a vast experience in teaching and mentoring different levels of trainees at peer-support "mentor meetings."

The research report here is conducted in the context of the "faculty mentor's growth". This study focuses on the professional growth and change of mentor faculty through the experiences at the intensive workshops conducted in the Osaka Prefecture University College of Technology since 2009.

RESEARCH DESIGN & METHODS

Previous studies have analyzed discussions at the final mentor meeting by employing the Steps for Coding and Theorization (SCAT) method, which is a sequential, thematic, and qualitative data analysis technique (Otani, 2008; Otani, 2011). With SCAT, the authors anecdotally reported the following six types of experiences that the mentors encounter: reflecting on an immature mentor, waiting for a mentee's awareness, collecting education data, recognizing a mentee's growth, leadership skills, and the values of Teaching Portfolio. In unbalanced mentee–mentor relationships, novice mentors particularly feel anxious and hence refrain from asking questions or advising older mentees; they are rather content with merely listening to their mentees' stories (Kato et al., 2018). Data on learning from one's mentoring experience were divided into two categories and seven subcategories. Category 1 (reflecting on an immature mentor) included the following four subcategories: difficulties with human relations, the inductive approach, self-awareness of immaturity, and no sense of accomplishment (Kato et al., 2018). The present study seeks to investigate differences in what constitutes good mentorship among mid-career faculty mentors by comparing the results of the author's previous qualitative research (Kato et al. 2018; Kato, 2019). Within the scope of this primary aim, this study also investigates how mentoring experiences influence the awareness of faculty mentors' growth by comparing the images among them.

This study defined how mentoring experiences influence the awareness of faculty mentors' growth as professionals and educators for mid-career faculty. Under the heading of this main aim, the following research questions were addressed:

1. What did you do in your role as a mentor or a supervisor?
2. What problems and difficulties did you experience during mentoring?
3. How do you feel about your own development as a mentor?
4. What is your opinion of the mentor meeting?

Participants

Ten mentors, two supervisors, and a coordinator participated in this project and were divided into two groups: A and B. Among 13 participants, nine professors were professors at the same college of technology, three mentors were from national colleges of technology, and one supervisory mentor was invited from a university.

Procedure

During three-day workshop, each mentor group separately held six mentor meetings to discuss how to support mentees and promote collaborative mentorship for the creation of teaching portfolios. In the final group discussion, a supervisor of group A acted as a facilitator and encouraged all participants to reflect on the mentoring process and what changes were seen before and after the mentoring experience. With the participants' permission, the final meeting was conducted and recorded on September 12, 2019.

The authors transcribed the audio recordings. The transcripts were analyzed using the Steps for Coding and Theorization (SCAT) method, a sequential, thematic qualitative data-analysis technique (Otani 2008, 2011). This approach was selected for its explicit analysis process, in that the process integrates qualitative data analysis with theoretical coding, and for its efficiency and validity of theorization from relatively small-scale data (Otani 2008). It includes coding steps from open to selective, storyline creation using final selective codes, and creating theories from the storyline. Accordingly, each utterance of each mentor was considered to be a single recording unit. These recording units were classified into categories and subcategories on the basis of their similarity of semantic content, with further themes extracted thereafter (Kato 2014). In total, 198 units were extracted from the transcripts of the final meeting (73:58 min) on the last day of the workshop.

RESULTS

Qualitative Analysis

Qualitative analysis identified 10 main categories and 29 subcategories. Examples of each aspect of the nine main themes are provided below, with subcategories and main categories denoted by angle brackets (<…>) and square brackets ([…]), respectively. In the paragraphs that follow, double quotation marks ("…") denote representative descriptions, and the numbers inside brackets denote unit numbers for each participant.

Mentor's Growth through Mentoring Experiences

Following the first research question, "What did you do in your role as a mentor or a supervisor?" the nine itemized subcategories were aggregated into three main categories: [Mentees' first], [Approach to educational philosophy], [Quality control].

The second research question "What problems and difficulties did you experience during the mentoring?" prompted us to aggregate three itemized subcategories into one main category: [Reflection on mentorship]. This main category included the following three subcategories: <Communication competence>, <Feeling of wrongness>, and <Rule of two>.

The third research question, “How do you feel about your own development as a mentor?” suggested aggregating nine itemized subcategories into three main categories: [Relationship of trust], [Overcome differences] and [Data collection for mentors’ educational improvement], which identified the benefits in being a mentor.

Factors contributing to the peer meetings that fell under the fourth research question were grouped into three categories [Learning from other mentors], [Under the supervision], and [Ask for a second opinion]. At the mentor meetings, mentors recognized mistakes and changed their mentoring strategies through discussion with others, which was a peer learning for mentors’ growth (Kato et al. 2018).

CONCLUSION

It was observed that the previous qualitative study of mentorship provided only approximate classifications of the learning activities of mentors because it focused on selected aspects of mentor experiences (Kato et al., 2018). The results of the present study are compatible with previous quantitative and qualitative analysis as a means to add rigor to evaluate subtle differences between experienced and supervisory mentors with various backgrounds. An enhanced understanding of the perceptions of mentorship may help develop the professional development that will foster diversity among future academic educators in higher educational institutions.

In accordance with previous findings (Kato et al., 2018), this study also indicated that experienced mentors recognized the importance of helping mentees identify their problems related to the effective mentoring skills and the value of mentor meetings. This tendency indicated that mentors emphasized the importance of information sharing between mentors for improving their mentor skills and attitudes toward their mentees.

However, it may be difficult to determine exactly where and when a particular insight occurred. Reflections also varied in the way in which cooperating mentors and supervisors are involved in discussions during mentor meetings. Reporting about one’s mentoring process appears to be a complex endeavor. It is imperative that future studies continue to employ both qualitative and quantitative analysis to learn more about the nature and quality of mentorship that emerges under different conditions.

REFERENCES

Fraser, K., Gosling, D. & Sorcinelli, M. D. (2010). Conceptualizing evolving models of educational development. In J. McDonald, & D. Stockley (Eds.), New Directions for Teaching and Learning, 122, 49–58, NJ: Wiley Periodicals, Inc.

Kato, Y. (2013). A virtual collaboration for the professional development of Japanese language teachers. *Asia-Pacific Collaborative Education Journal*, *9*(1), 53–61.

Kato, Y. (2014). Professional development: fostering integrative knowledge and pedagogy of Japanese language teachers through e-portfolio. *International Journal for Educational Media and Technology*, *8,* 24–40.

Kato, Y., Higashida, S., Kaneda, T., Kitano, K., Furuta, K., Hayakawa, K., Wada, T., Kurahashi, K., Ishimaru, H., Doki, C. & Yamashita, S. (2018). Awareness of mentors in the peer-mentoring conferences. *International Journal for Educational Media and Technology, 12*, 41–48.

Kato, Y. (2019). Mentors' Awareness of Effective Consultation Skills in a Teaching Portfolio Workshop: A Text-Mining Approach. *International Journal for Educational Media and Technology, 13*, 35–43.

McDonald, J. (2010). Charting pathway into the field of educational development. In J. McDonald, & D. Stockley (Eds.), New Directions for Teaching and Learning, 122, 37–45, NJ: Wiley Periodicals, Inc.

Otani, T. (2008). "SCAT" A qualitative data analysis method by four-step coding: easy startable and small-scale data-applicable process of theorization. *Bulletin of the Graduate School of Education and Human Development (Educational Sciences)*, Nagoya University, *54*, 27–44 (in Japanese).

Otani, T. (2011). SCAT: Steps for coding and theorization. *Kansei Engineering International Journal, 10*(3), 155–160 (in Japanese).

Development of a model for teaching support system based on a program for the use of nudge and gamification to improve career proficiency

Han Hee, Lee
hanybugy@naver.com
Doctoral student
Pukyung National University
Busan, Korea

Gyun, Heo
gyunheo@pukyung.ac.kr
Professor
Pukyung National University
Busan, Korea

Research on career programs for elementary school students at the Education and Welfare Preferential Support Business School is insufficient. Also, it is very rare to find a study on the development of programs to enhance career-related variables such as career-related variables of elementary school students at the Education, Welfare and Preferential Support Business School. In addition, it is necessary to develop a model for career exploration programs that can enhance career-related variables such as career-related variables of elementary school students at the Education and Welfare Preferential Support Business School. Therefore, the purpose of this study is to verify the effect on the career proficiency of elementary school students in the Education, Welfare and Preferential Support Project School by developing and implementing career exploration programs.

Key words: Education and Welfare Preferential Support Project, Elementary School Students, Career Sustainability, Nutty, and Gamification

INTRODUCTION

Korean society has grown in a compressed manner with the goal of economic development since the 1960s and 1970s, and achieved rapid quantitative growth and development by expanding the market competition system amid the wave of neo-liberalism in the wake of the 1997 Asian economic crisis. This economic and social development has resulted in a worsening income distribution structure and a widening social gap between classes, accelerating the problem of social polarization, which has led to a decrease in the middle class and a further widening of the poor (Lee Hye-young et al., 2006).

The deepening economic inequality among classes led to widespread concerns that social integration and cooperation could ultimately weaken the national competitiveness, and the need for social integration efforts through the state's policy support for low-income people was raised.

As the social structure and foundation for moving between classes are weakened, education is also passed down between generations, limiting the possibility of class movement through education. While the ultimate purpose of social integration should be realized through the opportunity to choose education, support without alienation or exclusion in the course of education, and the freedom of movement between classes by education, the current situation in which the gap between classes is widening is an important task for Korean society. Education is no longer able to play a role as a layer-movement ladder for members of society, and parents' economic and social status continues to the next generation, causing social inequality and alienation among classes to become entrenched. There are still relatively

marginalized classes in education, and social conflicts due to the widening gap between the rich and the poor are becoming increasingly serious social problems (Park Myung-shin et al., 2014).

As classes are divided by region and school, and the influence on educational achievement varies greatly from class to class, educational opportunities are becoming increasingly unequal, and countermeasures are needed. Starting with this awareness of the problem, the Ministry of Education has been pushing for various educational welfare projects to establish an educational safety net to address educational inequality.

The support project for educational welfare investment preferred areas, which began as a pilot project in 2003, has become a representative project to bridge the gap between classes of education (Lee Bong-ju et al., 2008). In particular, the Education and Welfare Preferential Support Project is an important national support project that virtually guarantees educational opportunities through equality of starting points for low-income students, and is actively developed by designating areas where low-income students are concentrated.

The educational welfare priority support project is Korea's representative educational welfare project 16 years after its implementation. Since the project was implemented in 2003 with the aim of resolving the educational gap between vulnerable children and teenagers and ultimately improving the quality of life, its effectiveness has been proven and has been continuously expanding so far.

There have been many changes, especially since 2011. In recognition of the achievements of the projects and social needs that had been implemented since 2003, the legal basis was provided by the partial revision of Article 54 of the Enforcement Decree of the Elementary and Secondary Education Act, and the financial stability was secured by the conversion of special grants from the central government to ordinary grants from municipal and provincial education offices.

The name of the project was also changed from the education welfare investment priority support project to the education welfare priority support project, and the implementation entity was also converted into a policy project supervised by the superintendent of education. This change is of great significance in that the nature of the education welfare priority support project takes the initiative in the region or the site and executes the project on its own.

Elementary school students at the School of Education and Welfare Priority Support generally do not receive enough parental support for physical, psychological and cognitive growth due to poverty caused by their parents' low income. As a result, it has both career-related variables, career-related variables, and learning-related variables, such as learning-related variables, due to low self-efficacy and lack of learning skills. As a result, elementary school students at the School of Education and Welfare Preferential Support may recognize the practical limitations early on due to negative family sentiment and cultural environment, forming low educational and vocational aspirations (Roh Sung-hwan, 2003).

And the financial difficulties of parents, the lack of knowledge and time, and psychological difficulties make the level of expectations for the future lower, and have low career maturity. As a result, elementary school students at the School of Education and Welfare Priority Support are likely to experience a vicious cycle of poverty, which makes them poor again after growing up due to low expectations for their careers, jobs and future.

There is a limit to the general career program focusing on how to write a place of activity to learn about one's characteristics or look into the world of work. In addition, there is a limit to the lack of activities that reflect the characteristics of elementary school students at the Education and Welfare Priority Support School. The program, which is operated for elementary school students at the Education and Welfare Priority Support Project School, needs to be added with activities that reflect their characteristics.

The Busan Metropolitan Office of Education is holding a two-day career camp for elementary school students during vacation at the Busan Career and Advancement Support Center (dream.pen.go.kr), which is located on the first floor of the Busan Education Research and Information Center. Major activities include traveling to visit me, basics of success, attractive me, lists of dreams, vision visualizations, career golden bells, surpassing me, and increasing confidence. Japanese/Korean/Chinese/or others which is not English books or articles, write the romanized titles if they exist.

RESEARCH DESIGN & METHODS

The subjects of the study are students who attend S Elementary School in Nam-gu, Busan, and Y Elementary School in Gijang-gun. The experimental group S Elementary School students (different grades) are prescribed a program for career exploration and are not given to Y Elementary School students. Pre-inspection results are derived by utilizing the career proficiency test paper before the program is injected into the experimental group and the control group, and the degree of change of career proficiency between the two groups is compared by utilizing the homogeneous test paper after the program is injected.

The Ministry of Education and the Korea Vocational Competency Development Institute planed and developed by the Korea Youth Counseling and Welfare Development Institute (Sumi, Kim Dong-il, Lee Dong-hyuk, Cha Joo-hwan, Yang Mi-jin, So Soo-yeon, Yoo Jun-ho, Kim Ji-hye, Lee Ji-eun, and Lee Tae-young) to measure the results using CareerNet Career Proficiency Test (63 questions, which takes 15-20 minutes). The Careernet Career Proficiency Test was developed in 2001 and has been widely used by students and teachers as online prosecutors for the past 11 years.

There are three inspection items: career maturity (planality, independence, attitude toward occupation, career optimism), career maturity (self-understanding, rational decision-making, information exploration, desired job knowledge), and career maturity behavior (preparing for career exploration). The test results are presented as a graph of nine career proficiency scores for each individual, and the results of each career attitude, ability, and behavior dimension are presented in pictures and graphs, and the interpretation of results for each dimension and area is presented. The number of students tested has also increased every year, with millions of students conducting tests so far. Career net career test has been used as follows.

It provided diagnostic information on the degree of attitude and ability necessary for career exploration and decision making. By identifying the characteristics of students in the scenes of school career education, basic materials were provided to select and guide appropriate education contents. Used as a tool to measure the effectiveness of career education. By having students check their career level, they provided information on what efforts they needed to make in the future.

A new standard was produced based on data from a nationwide group of standards to reflect changes in characteristics. The results table was revised to improve the effectiveness of the test results. The results table was revised to more effectively convey the purpose of career proficiency testing by reflecting the results of various required surveys raised in the existing test results table. A paper scoring system was prepared. The utilization of test results has been increased.

Offline as well as existing online examinations, this examination includes a total of eight areas: planning, attitude toward occupation, independence, self-understanding, rational decision making, information exploration, knowledge of preferred jobs, career exploration and preparatory behavior.

It is required to measure the area of maturity in the fields of attitude, ability and behavior, and provides students with the opportunity to think about themselves and their career path through the execution of tests. More than 70 percent of the students surveyed said the implementation of the career proficiency test provided an opportunity to think about their career paths and reflect on themselves. This test is evaluated by career decision making ability and by the self-reporting method of Career Maturity Inventory (CMI).

Competency testing has the disadvantage of being overly highly correlated with cognitive abilities, while self-reporting methods are designed to provide self-assessment experience for the various factors within each sub-area. The self-reporting method has the advantage of being able to conduct inspections without any burden if the inspection time is short and you have basic language reading skills.

This inspection has made utmost efforts to verify the reliability and validity of the test, and as a result, it has secured satisfactory grounds for reliability and validity. For reliability, the inspection-re-examination reliability was verified, as well as the internal consistency coefficient, and the validity was reviewed for content equivalence, job-tolerance, and result-tolerance.

This examination can be conducted both online and offline. If offline, results can be obtained through the written test scoring system. In addition, in order to increase motivation for conducting the test and to draw sincerity in response, this inspection applied a editing system that best suits the cognitive and defining characteristics of students through collaboration with professional visual designers. As a result, students were asked to respond positively to the appearance of the test paper. The test only takes about 20 minutes for all middle and high school students.

When it was first developed, the number of questions reached 105 was reduced to 63 through the study of revision of inspection. Therefore, it was designed to measure the level of self-improvement and participate in self-reflection trips without feeling bored with the examination. This examination consists of the course of the examination being an educational experience. While learning what attitudes and abilities are necessary for career exploration and decision-making, students are able to understand how well they have their own attitudes and abilities.

By checking the level of their career development on their own, students can find out whether they have thought enough about their career path and provide information on what efforts they need to make in the future to help students self-reflect.

In fact, 75.3 percent of the surveyed students said they were able to think about their career path through the test, while 70.1 percent said it was an opportunity to look back on themselves.

Self-understanding related to career problems includes aptitude, interest, and values as well as career proficiency. Post-learning and activities to supplement each area were presented along with the test results so that learning could be done to supplement the deficient areas on its own, not just to check the results of the test.

In order to verify the effectiveness of the career support system model based on the career exploration program using nuts and gamification, the results of the test are statistically processed using SPSS/WIN (Version 25.0), and the group's pre-score analysis (Analysis of Covariance: ANCOVA) is conducted as co-variates. In addition, qualitative research through case studies will be conducted on students of schools subject to program prescription based on questionnaires, impressions and targeted interviews, and qualitative data analysis will be conducted using the Nvivo program.

REFERENCES

[1] Joo Jung-hyun (2010). A Study on the Effectiveness of the Support Project for Educational Welfare Investment Preferred Areas: Focused on the Comparison of Effectiveness between the Service Target and the Non-Targeted Youth. a doctoral dissertation at the Graduate School of Sangmyung University

[2] Kim Kyung-hee (2011). Development of programs for education on human rights by subject for the elimination of prejudice and improvement of awareness of mental patients. industrial-academic cooperation group of Seoul Women's Nursing College

[3] Liu Bang-lan et al (2013). The task of developing educational welfare (towards an educational community). Korea Educational Development Institute

[4] Lee Bong-ju (2008). Analysis of the Effect of Education, Welfare and Investment Priority Area Support Project: A Comprehensive Comparison of the Development of Children in Participating Schools and Nonparticipating Schools, the Korea Youth Policy Institute.

[5] Lee Hye-young et al (2006) The Impact of School Education on the Movement of Social Classes, Korea Educational Development Institute.

[6] Noh Sung-hwan (2003). A Study on the Determinants of Youth's Career Attitude and Sustainability in Permanent Rental Apartment Complex. Yonsei University Graduate School of Social Welfare for Master's Degree.

[7] Park In-sim (2007). A Study on the Case of Personal Psychological Consultation on the Unadjusted School Life of High School Students in the Reverse Function Family. a master's thesis at the Graduate School of Education at Daebul University

[8] Park Mi-ran (2009). The Effect of Educational Welfare Program on the School Adaptation of Low-income Children. a master's thesis at Hallym University's Graduate School of Social Welfare

[9] Park Myung-shin et al. (2014). A study on the gender role stereotypes of female college students and their impact on career barriers, and welfare counseling education.

[10] Yoon In-soo (2011). A Study on the Work Experience of School Social Welfare Workers a master's thesis at Konkuk University's graduate school

[11] Yu baek-san (2013). Home background and in-house communication and academic achievement. Master's degree thesis at Korea University Graduate School.

Cancelled Presentation List

It has been noted that the following presentations have cancelled at the conference.

Roundtable Session

S1-D2 Research on the Application of Online Teaching Model during the COVID-19 Pandemic. p.78
Qiuyu Pu

S2-D5 Discussion on the Construction of Classroom Management Model in Live Online Teaching. pp.154-155
Guanchao Feng

Concurrent Session

S1-B2 Two by Two on One. pp.209-213
Katherine Watson

S1-C2 Discussions of Diversity and Understanding: A Faculty Training Pilot on Online Microaggression. pp.235-239
Kae Novak

S1-C3 Online teaching practice of public elective courses based on "inquiry learning and open access". pp.240-243
Huawei Cui, Miao Aimin

S2-E4 Preaching without a Choir: Solutions to Global “Illectronisme”. pp.509-511
Katherine Watson

S2-G4 Development of a model for teaching support system based on a program for the use of nudge and gamification to improve career proficiency. pp.557-560
Han Hee Lee, Gyun Heo