ICEL 2019

2019 International Conference on

Education and Learning

http://ICEL2019.gaics.org

Conference Organizers

Global Academic-Industrial Cooperation Society

American Public University

Ritsumeikan University

Osaka International House Foundation, Osaka, Japan

August 28-30, 2019

Contents

Welcome from the ICEL Conference Chair

On behalf of the Organizing Committee, we are honored and delighted to welcome you to the 2019 International Conference on Education and Learning (ICEL), held at Osaka International House Foundation, Osaka, Japan on August 28-30, 2019, which is jointly together with the International Conference on Health, Nutrition, and Exercise Science (HNES), International Conference on Hospitality, Tourism, and Sports Management (HTSM), International Conference on Engineering, Science and Applications (ICESA), and International Conference on Industry, Business and Social Sciences (IBSS). Together these conferences form the 2019 Global Academic-Industrial Cooperation Society (GAICS) Joint Conference in Osaka, Japan.

These five conferences operate separately but are managed and organized under the Global Academic-Industrial Cooperation Society (GAICS). The 2019 GAICS Joint Conference in Osaka, Japan is a prestigious gathering of researchers held to share and strengthen interdisciplinary research around the world. This event emphasizes interdisciplinary interaction and collaboration. Through this interdisciplinary joint conference, participants can build a global link, share viewpoints from different perspectives, and seek collaboration and research opportunities across fields.

The success of organizing an international conference fully depends on the integrated effort of many participants. We would like to take this opportunity to thank all the researchers who submitted their manuscripts and participate in the conference, and to all the reviewers for their great assistance and support. We also would like to thank the many international committee members for their full support and great enthusiasm. In addition, a special thanks would like to be given to Dr. Yuko Yato and Dr. Yukako Wada for helping host the conference and to Dr. Kassem A. Saleh and Dr. Masafumi Terada for their keynote speech.

If Kyoto was the city of the courtly nobility and Tokyo was the city of the samurai, then Osaka was the city of the merchant class. Osakans take pride in shedding the conservatism found elsewhere in Japan, and this spirited city – Japan's third-largest – is a place where people are a bit brasher and interactions are peppered with playful jabs. Greater Osaka has an extensive network of railway lines, comparable to that of Greater Tokyo. Major stations within the city include Umeda, Namba, Shinsaibashi, Tennōji, Kyōbashi, and Yodoyabashi.

Finally, we hope this conference will be a great success and will be fruitful to all participants in both academic and social aspects. We also hope that you will enjoy your stay in Osaka.

Dr. Bob Barrett, ICEL 2019 Conference Chair
August 28, 2019

Committee

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Conference Chair of ICEL 2019

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Conference Local Chair

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- **Jie Zhang,** Xi'an Jiaotong Liverpool University, China
- **Xin Zhang,** Shantou University, China
- **Kristian Pérez Zurutuza,** EHU-UPV, UNED, Spain

Keynote Speaker 1

Kassem A. Saleh, Ph.D., PMI PMP-RMP

Dr. Kassem A. Saleh received his BSc, MSc, and PhD in Computer Science from the University of Ottawa in Canada. Dr. Saleh worked as a Software Design Engineer at Northern Telecom in 1984 and then as a Computer Systems Specialist at Mediatel, Bell Canada, from 1985 to 1991. Kassem was on the faculty of Concordia University in 1992, Kuwait University from 1992 to 2000, and the American University of Sharjah from 2000 to 2007. He is currently Professor in Information Sciences at Kuwait University. His research interests include software engineering, information security, quality and risk management and project management. Dr. Saleh has published more than 130 refereed journal and conference papers and one textbook on Software Engineering and has presented numerous tutorials, lectures and invite talks at international conferences and universities. The Journal of Systems and Software has ranked Dr. Saleh among the top ten scholars in the field of systems and software engineering in eight of its annual assessments published from 1996 to 2003. Dr Saleh holds professional certifications in software engineering (IEEE CSEM), information security (ISC2 CISSP), project (PMI PMP) and risk management (PMI PMP-RMP), quality engineering (ASQ CQE, ASQ CSQE) and business analysis (PMI PMP-BA).

TOPIC: Risk Management for Successful Projects and Operations - Why and How?

Abstract

Risks are facts of our lives whether personally or at work. Risks can be positive (opportunities) or negative (threats). They should be managed and treated properly, continuously and systematically otherwise undesirable situations and outcomes, and missed opportunities may result leading to business failures, loss of competitiveness and disasters. The proper use of risk management skills is one of the major requirements for planning and executing successful projects and operations in enterprises. In this talk, you will be exposed to the systematic processes that need to be performed to manage risks and deal with them should they become a reality. In particular, we will talk about the various risk response strategies used to treat positive and negative risks.

Keynote Speaker 2

Masafumi Terada, Ph.D., ATC

Dr. Terada is the assistant professor at Ritsumeikan University where he holds academic appointments in Faculty of Sport and Health Science. He earned his BS from University of Nebraska at Kearney, and his MS and Ph.D. from the University of Toledo. He also completed post-doctoral training at the University of Kentucky. His primary area of research deals with ankle and knee injuries to reduce the long-term consequences of these conditions over the lifespan. He studies these injuries from a multifactorial perspective using diverse tools ranging from laboratory- based outcome measures of biomechanics and motor control to patient-generated outcome measures. In his career, Dr. Terada has over 30 published and/or in-press peer-reviewed manuscripts in scientific journals and has presented over 60 abstracts at international, national and regional scientific meetings.

TOPIC: An Interdisciplinary Approach to Sport Injury Prevention and Management

Abstract

Participation in sports and physical activities has an important role in a healthy lifestyle. However, it is associated with an inherent risk of musculoskeletal injury. Musculoskeletal injuries represent the second greatest cause of disability worldwide. With increasing government and society emphasis on sport and physical activity, the number of musculoskeletal injuries will remain constant or increase as more individuals participate in physical activities. It is critical to establish a more cost-effective and efficient method for preventing and managing musculoskeletal injury. Successful sports health care is interdisciplinary in nature. An interdisciplinary approach plays an integral role in reducing risk of sustaining of musculoskeletal injuries during sports and physical activities. The interdisciplinary approach provides the current best evidence regarding the use of translating the novel biomechanics techniques into clinical practice. Therefore, collaborations within the broader fields of sports medicine can improve clinical outcomes for patients with a musculoskeletal injury. This talk will feature an interdisciplinary team that has shown a unique set of skills that enable us to tackle the cutting-edge approaches of preventing and managing sport injury. At the conclusion of the program, participants will be able to explain the benefits of a collaborative approach to sport injury prevention and management.

IBSS, ICEL, ICESA, HTSM, HNES 2019

Conference Schedule

August 28, 2019 (Wednesday) 08:00-15:30 Half-Day Local Tour 15:30-17:30 Check In & Welcome Reception Party	
Time	**Event**
08:00-15:30	**Industry Tour**
08:00-08:15	**Meet Up** **Osaka International House Foundation**
08:15	Departure
09:15	Visit The Momofuku Ando Instant Ramen Museum
12:00	Lunch Time
13:30	Visit The Entrepreneurial Museum of Challenge and Innovation
15:00	Return
15:30	Arrival **Osaka International House Foundation**
15:30-17:30	**Check In & Welcome Reception Party** **Osaka International House Foundation**

Conference Schedule

<table>
<tr><td colspan="5">August 29, 2019 (Thursday)
ICEL International Committee Meeting at 13:20 in Room 1 Floor 3rd</td></tr>
<tr><td>Time / Room</td><td colspan="4">Event</td></tr>
<tr><td></td><td>(Session) A</td><td>(Session) B</td><td>(Session) C</td><td>Sakura (east)</td></tr>
<tr><td>09:00-16:00</td><td colspan="4">Check In</td></tr>
<tr><td rowspan="2">09:30-10:30</td><td colspan="4">Room Sakura (east)</td></tr>
<tr><td colspan="4">Opening Ceremony
Keynote Speeches
Distinguished Papers Award</td></tr>
<tr><td>10:30-10:50</td><td colspan="4">Coffee & Tea Break</td></tr>
<tr><td rowspan="2">10:50-12:10</td><td>A1</td><td>B1</td><td>C1</td><td>Room Sakura (east) 1</td></tr>
<tr><td>HTSM
(Oral)
#0030 #0048
#0082 #0090</td><td>HTSM
(Oral)
#0040 #0042
#0083 #0092</td><td>HNES
(Oral)
#0040 #0046
HTSM
(Oral)
#0136 #0138</td><td>IBSS (Poster)
#0044 #0056
#0057 #0072
HNES(Poster)
#0028 #0029 #0031 #0033
#0041 #0043 #0047</td></tr>
<tr><td>12:10-13:20</td><td colspan="4">Lunch Time</td></tr>
<tr><td rowspan="2">13:20-14:40</td><td>A2</td><td>B2</td><td>C2</td><td>Room Sakura (east) 2</td></tr>
<tr><td>HTSM
(Oral)
#0036 #0053
#0077</td><td>ICEL
(Oral)
#0027 #0036
#0044 #0109</td><td>IBSS
(Oral)
#0037 #0051
#0067 #0113</td><td>ICESA
(Poster)
#0029 #0032 #0034 #0037
#0043 #0045 #0046 #0058
#0060 #0061</td></tr>
<tr><td>14:40-15:00</td><td colspan="4">Coffee & Tea Break</td></tr>
<tr><td rowspan="2">15:00-16:20</td><td>A3</td><td>B3</td><td>C3</td><td>Room Sakura (east) 3</td></tr>
<tr><td>HTSM
(Oral)
#0044 #0065
#0079</td><td>ICEL
(Oral)
#0068 #0070
#0072</td><td>IBSS
(Oral)
#0052 #0054
#0070 #0077</td><td>HTSM (Poster)
#0049 #0057 #0071
#0101 #0104 #0145
ICEL (Poster)
#0043 #0049 #0064
#0088 #0090 #0096
#0101 #0102 #0104</td></tr>
<tr><td>16:20-16:40</td><td colspan="4">Coffee & Tea Break</td></tr>
<tr><td rowspan="2">16:40-18:00</td><td>A4</td><td>B4</td><td>C4</td><td>Room Sakura (east) 4</td></tr>
<tr><td>HTSM
(Oral)
#0099 #0118
#0132</td><td>ICEL
(Oral)
#0071 #0094
#0107</td><td>ICESA
(Oral)
#0063 #0070
#0071</td><td></td></tr>
</table>

Conference Schedule

August 30, 2019 (Friday)
Osaka International House Foundation, Osaka, Japan

Time / Room	Event		
	(Session) A	(Session) B	(Session) C
09:00-16:00	Check In		
	A5	B5	C5
09:30-10:50	**HTSM** **(Oral)** **#0066 #0102** **#0106 #0125**	**ICESA** **(Oral)** **#0055 #0057** **#0062 #0069**	**IBSS** **(Oral)** **#0036 #0042** **#0060 #0074**
10:50-11:10	Coffee & Tea Break		
	A6	B6	C6
11:10-12:30	**HTSM** **(Oral)** **#0001 #0085** **#0087 #0088**	**ICEL** **(Oral)** **#0065 #0082** **#0086 #0093**	**IBSS** **(Oral)** **#0048 #0068** **#0076 #0079 #0082**
12:30-13:20	Lunch Time		
	A7	B7	C7
13:20-14:40	**HTSM** **(Oral)** **#0069 #0121** **#0141 #0149**	**ICEL** **(Oral)** **#0054 #0061** **#0062 #0069**	**IBSS** **(Oral)** **#0062 #0063** **#0088 #0091**
14:40-15:00	Coffee & Tea Break		
	A8	B8	C8
15:00-16:20	**HTSM** **(Oral)** **#0123 #0134** **#0137 #0140**	**ICEL** **(Oral)** **#0038 #0046** **#0078 #0089**	**IBSS** **(Oral)** **#0083 #0098** **#0110 #0105**

Conference Floor Map

2F
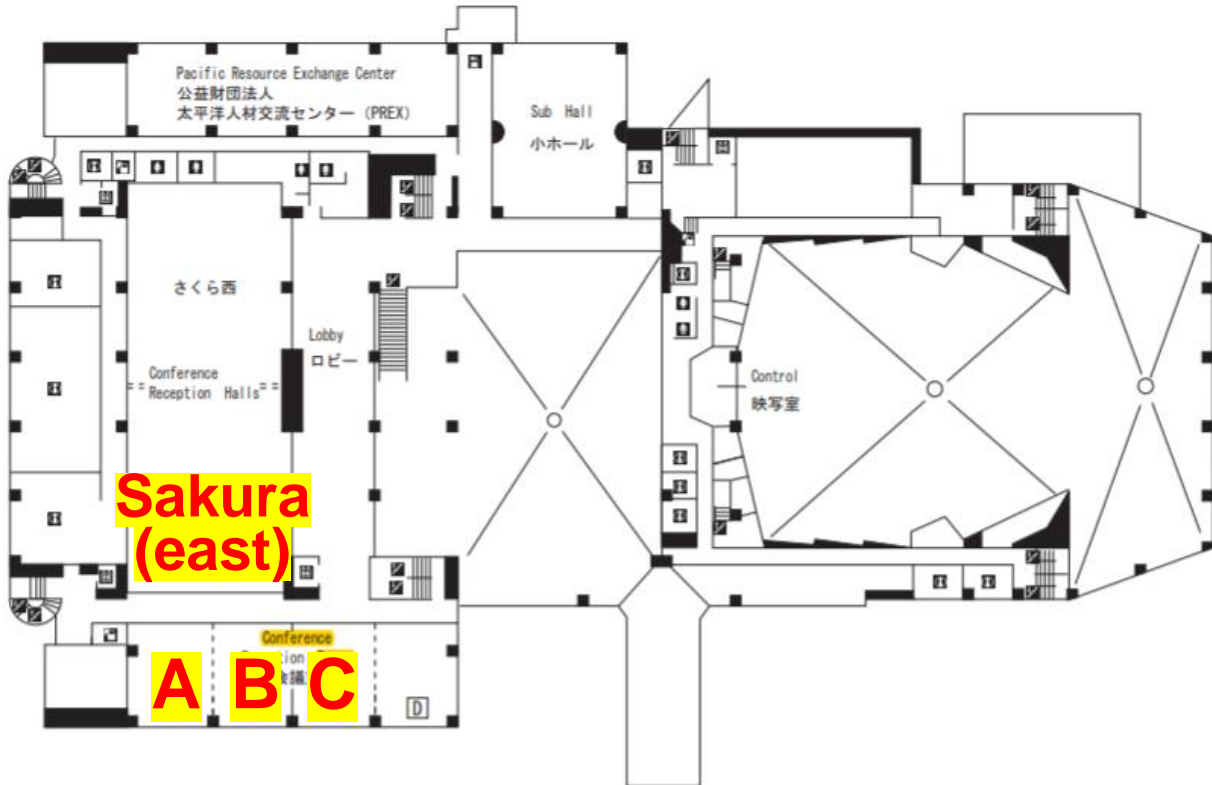
3F
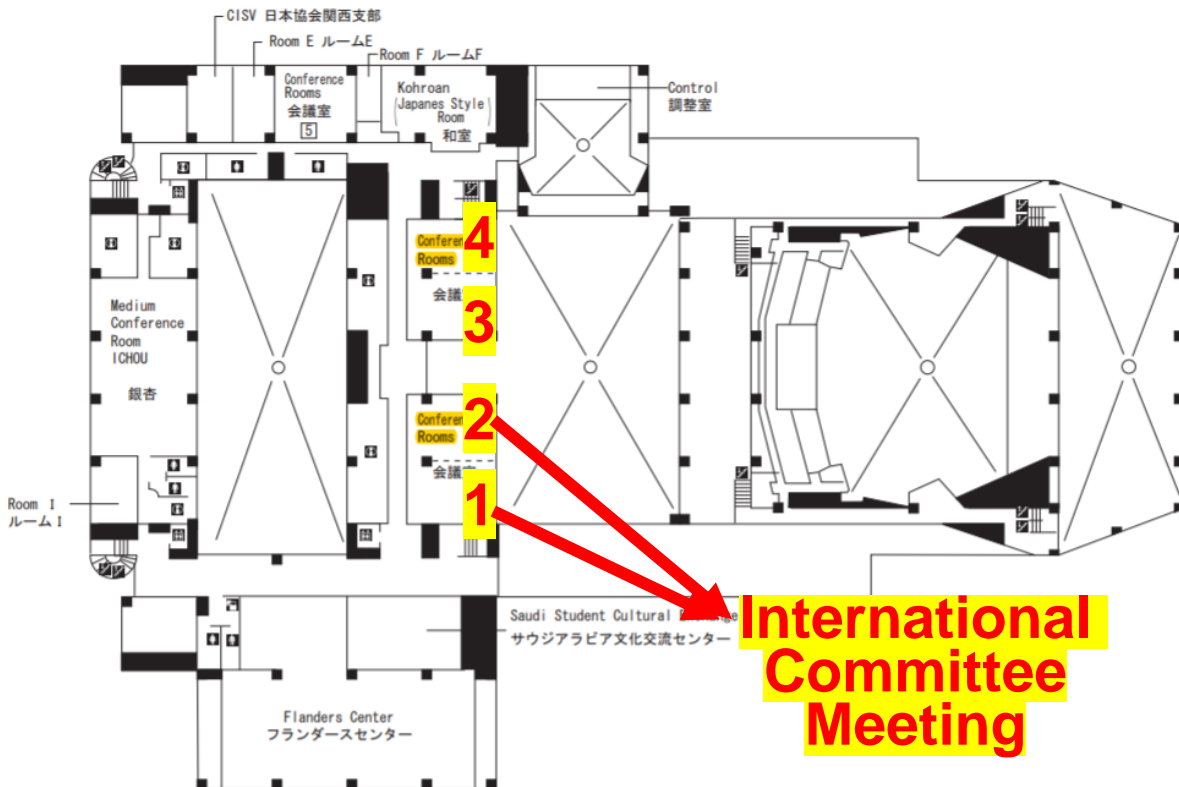
Guidelines for Presenting Authors and Session Chairs

Presentations are brief discussions of a focused topic delivered to a group of listeners in order to impart knowledge or to stimulate discussion. Begin your presentation by telling your audience what your topic is and what you will be covering. A notebook is equipped with an LCD projector for every session room. Each speaker must bring his/her own **USB memory stick** for transferring the file(s) to the notebook setup at each session. **No overhead projectors** will be provided. Please arrive at your session early so that you have time to test the connection to the projector and know the session chair and colleagues going to present at this session. Visual aids (such as maps, photos, film clips, graphs, diagrams, and charts) can enrich and enhance the effectiveness of a presentation.

During the presentation, the Session Chair's role is to coordinate the smooth running of the session. Please begin and end the session on time. The order of presentations are printed in the session program. If a speaker cancels or does not show up, the original time schedule should be adhered to rather sliding every talk forward. As a session chair, please check the session program before you start chairing the session. In case that one of your session's speakers cancels at the very last minute, you might have available a short talk of your own to help maintain the continuity of the session. Each session normally contains 80 minutes, with the time per presentation determined by the number of papers in the session. Equal time should be given to each paper. A well-prepared **Session Chair** can help ensure that the speakers give high quality, trouble-free talks and that the audience appreciates the entire session.

Finally, thank you for your participation and contribution to the conference.

Session: B2	13:20-14:40	29-Aug-2019	Meeting Room B2
Session Chair: Dr. Sunny Sun		ICEL

ICEL_0027

Peer Instruction, Mobile Technology and Learning Effectiveness -A Pilot Study in Intermediate Accounting

Philip Chan, The Hong Kong Polytechnic University, Hong Kong

Sunny Sun, The Hong Kong Polytechnic University, Hong Kong

Ching Yee Tam, The Hong Kong Polytechnic University, Hong Kong

ICEL_0036

Building belonging through authentic leadership: authentic decisions: The QModel

Andre Casson, Australian International School, Singapore

Eddie Groughan, Australian International School, Singapore

ICEL_0044

The Development For Board Game Design As Educational Materials: A Case Study For The Issue Of Agricultural Farming Integrating Into Green Renewable Energy

Chieh-Ju Huang, Chienkuo Technology University, Taiwan

Sheng-Ming Wang, National Taipei University of Technology, Taiwan

ICEL_0109

The Project-Based Living Technology Curriculum Development through Bunun Indigenous Knowledge Systems

Chen Chun-Yu, National Kaohsiung Normal University, Taiwan

Chang Pei-Hsuan, National Kaohsiung Normal University, Taiwan

Chang Mei-Chen, National Kaohsiung Normal University, Taiwan

Lin Hsiu En, National Kaohsiung Normal University, Taiwan

Peer Instruction, Mobile Technology and Learning Effectiveness - A Pilot Study in Intermediate Accounting

Philip Chan, Sunny Sun*,Ching Yee Tam

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The Hong Kong Polytechnic University Kowloon, Hong Kong

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Abstract

The major objective of this study is to have a trial application of Peer Instruction (PI), an innovative pedagogy invented by Eric Mazur in early 1990s, in accounting education. A secondary objective is to test the mobile technology as a medium in applying PI. Involving students in teaching and learning, PI has been proved to be highly successful and widely adopted in various disciplines. Combining UReply as a mobile-enabled platform, we tested the effectiveness of PI. In particular, Intermediate Accounting, a technically challenging accounting course, has been employed as the experiment subject. During September to October, 2017, 6 rounds of PI for 3 topics were carried out. Overall, the resulted 459 valid observations show that, after the peer discussion, (1) the percentage of students hitting the right answer has an average increase of 17.24%; (2) students changing from the wrong answer to right answer is more than 3 times of those changing for the opposite direction. Results hold for both qualitative and quantitative questions. The post-test discussion also shows that students reckoned the benefits of PI through UReply. This pilot study demonstrates that PI can also be effectively applied in difficult accounting subjects with modern technology. Echoing the existing literature, however, the success of PI reigns over many factors including culture differences, participants' motivation, well-designed and tested questions at appropriate complexity and difficulty level

Keyword: Peer instruction, Mobile technology, Learning effectiveness, Accounting

Building belonging through authentic leadership: authentic decisions: The QModel

Andre Casson*, Eddie Groughan

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Abstract

The emphasis of this paper orients to the sway of Kaplan and Kaise (2003) where "leadership consists of opposing strengths, and most leaders have a natural tendency to over-develop one at the expense of its counterpart. The resulting imbalance diminishes their effectiveness. But leaders who work to guard against such lopsidedness can increase their versatility and their impact".

While the Kaplan and Kaise study maintained a specific focus on 'forcefulness', the proposed QModel adopts a broader perspective. The QModel offers the supposition that there are three domains for leadership, in relation to creating 'belonging' within an organisation or community.

The combination of each of the three domains, IQ, EQ and LQ, generates leadership decision-making where authenticity and creating a sense of organisational belonging are inherent.

Keyword: Authentic leadership, authentic decisions, belonging, quotients, QModel

The Development for Board Game Design as Educational Materials: A Case Study For The Issue Of Agricultural Farming Integrating Into Green Renewable Energy

Chieh-Ju Huang[1]*, Sheng-Ming Wang[2]

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Abstract

The purpose for educational materials aims to help the students learn more about the contents from the teaching process. And educational materials from this research are the assisted instructions for improving teaching effectiveness. The form of educational materials in this research is board game since the learners here are 3-6 grades students in elementary school. The subject is basically "Science and Technology", especially the issues of agricultural farming and green renewable energy. In this board game, biomass energy is the connection between farming and energy, which is the organic material produced by farming and conversing to usable energy. From designing this board game, this research starts from understating how and what the teachers teach from the issues of agricultural farming and green renewable energy in Taiwan. Following "Learning by doing" by John Dewey, the game rules are basically designed for the players learning the corresponding knowledge from the social behaviors in the playing process. The players can learn and cultivate the basic knowledge and literacy of green energy through the learning methods of future classrooms such as exploration, experiment, experience, and empowerment. Because of the illustrative visual style, this game can be carried out with related courses in school, so that students will raise attention, understand the relevance of knowledge, enhance self-confidence, and get satisfaction from the feedback during playing. This board game starts with the extraction of character cards, and then gets on with the cultivation of four crops, harvesting seeds, leaves, and evolving into fruit harvests to gain energy house block rewards. Different functional cards are used on the way to achieve crop evolution, and it can also block other players such as the basic roles from bugs, winds, water, and sun. When the crop is harvested, the player can get an energy house block. These blocks present each energy as biomass, winds, water, firepower, and solar energy. After collecting biomass, winds, water, and firepower blocks in order, lights are activated when the solar block is placed on the roof. A mercury resistor is placed in the roof to control the electric current and illuminate by the direction of the display. It reminds that energy can generate power for the special feedback while winning. The future study will start from the testing and evaluation of this board game, and hopefully it can cooperate with the teachers who teach in elementary school for "Science and Technology" in order to getting the feedback and testing the teaching and learning effects after playing this board game. This project is supported by the National Science Council, Republic of China, Taiwan, under the Contract No. MOST 106-2514-S-027-001-, and has the honor to get "Red Dot Award 2018: Design Concept".

Keyword: Educational Materials, Board Game Design, Green Renewable Energy Education, Agricultural Farming Education

The Project-Based Living Technology Curriculum Development through Bunun Indigenous Knowledge Systems

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Abstract

The school education is connected closely and inseparable to cultures. In Taiwan , the minority of cultures are easily ignored such as the indigenous people, because of the courses are mostly designed based on the mainstream culture. With little connection to the indigenous students' experience, their learning performance and confidence will be poor. The subjects of this study were the 7th graders of Bunun's school in south Taiwan. The goal of this study aimed to discover their learning styles and difficulties and then to develop the living technology course suitable for the Bunun's students. The course was designed on the basis of the Bunun's culture and students' experience, and was conducted in Project-Based Learning model, according to the core competency in Living Technology of Taiwan's Curriculum Guidelines of 12-Year Basic Education. "Liu-long", the Bunun's traditional transportation, is core topic of the course. After the practice of the course, exploration of Bunun's culture, students' learning styles and performance were collected through students' feedback, interview records, and classroom observation logs. Through the integration with Bunun's knowledge systems, we will develop the culturally responsive living technology curriculum and teaching materials that are in great need.

Keyword: learning style, the Bunun, culturally responsive curriculum, Project-Based Learning, living technology

Session: B3	15:00-16:20	29-Aug-2019	Meeting Room B
Session Chair: Dr. Wendy FM Chan		ICEL

ICEL_0068

Factors Affecting Perceived Quality of Students on Selection of Community Colleges in Hong Kong

Wendy FM Chan, PolyU Hong Kong Community College, Hong Kong

YC Yip, Hong Kong Shue Yan University, Hong Kong

ICEL_0070

Educational Game on Sign Language

Paula Escudeiro, GILT- Research Unit, ISEP/IPP, Portugal

Nuno Escudeiro, GILT- Research Unit, ISEP/IPP, Portugal

ICEL_0072

Examination on Students' Learning Effectiveness in Design Thinking of a Psychology Course

Meng-Fang Tsai, National Pingtung University of Science and Technology, Taiwan

Factors Affecting Perceived Quality of Students on Selection of Community Colleges in Hong Kong

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Abstract

The education system in Hong Kong was reformed in 2000. The Hong Kong government encouraged high education institutions to supply additional tertiary places in selffinanced community colleges so that 60% of secondary graduates will have postsecondary education opportunities by 2010/11. The number of community colleges and related sub-degree programs in Hong Kong increase from 4 to 20 and 2468 to 24000 respectively from year 2000 to 2006. The supply of full-time sub-degree places increase from 9397 to 31768. The mass expansion of higher education market leads to strong competition.

Research on students' choice on community colleges in Hong Kong is limited as this is a new market. Decision making factors in America are different from Asia due to cultural difference. This research adopts a consumer's perspective view and has an exploratory study on understanding the students' decision making on community colleges in Hong Kong based on their perceived quality. It aims to identity which factors in community colleges' product features affecting students' decision making.

The findings from the quantitative survey conclude that the brand name, professional qualification, and articulation rate to university have positive effect on students' perceived quality whereas school fee has negative effect. Articulation rate to university is the most important factor for students to select a community college. However, college facilities have no effect on students' perceived quality and thus the decision making. The research study resulted in a decision making model that help educators and management team of self-financing institutions to plan various marketing strategies for their survival in the private tertiary education sector.

Keyword: Community Colleges, Associated Degree, Perceived Quality, Articulation

Educational Game on Sign Language

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Abstract

Educational digital content available for the deaf and hearing-impaired community is very scarce. However, due to extraordinary progress of the new technologies, remarkable opportunities to bring a better quality of life to the public in general arose. Making these opportunities available to those who endure handicap and disabilities is a core concern in today's society and a must to promote equity and inclusion. The target community addressed by our work, the deaf and hearing-impaired community, has its own language, known as Sign language. The work presented in this paper consists in the development of a game to make the process of learning sign language enjoyable and interactive. In order to do this, a game was created in which the player controls a character and interacts with various objects and non-player characters with the aim of collecting several gestures from the Portuguese Sign Language. These gestures can then be represented by the character. This allows the user to visualize and learn or train the various existing gestures. To raise the interactivity and to make the game more interesting and motivating, several checkpoints were placed along the level. This will provide the players a chance to test the knowledge they have acquired so far on the checkpoints by using Kinect. A High Scores system was also created as well as a history to ensure that the game is a continuous motivating process as well as a learning process.

Keyword: Educational game, Gesture language, Sign Language Game development, Portuguese Sign Language

Examination on Students' Learning Effectiveness in Design Thinking of a Psychology Course

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Abstract

In general, the learning in psychology is more likely to focus on memorization of related theories and concepts. However, many social issues can be closely associated with psychological theories or concepts. It becomes crucial to provide opportunities and allow students to apply the learned knowledge into real social issues and find out innovative solutions for the issues. There is little research on using design thinking instructional approach and examining students' learning experiences in psychology.

The study was conducted in a psychology course in a university, to examine students' learning experiences in design thinking. The researcher employed a mix-method research approach to collect quantitative and qualitative data. For design thinking final project, students had to choose one out of the four human-centered society-related topics (i.e., companion, aging society, lack of resources for children in rural areas, and cyberbullying). Students needed to follow five-step design thinking procedures over the semester and applied the learned content knowledge in psychology, to develop innovative solutions for the needs of their chosen topic.

The Questionnaire on Learning Experiences in Design Thinking (QLEDT) was piloted and finalized in an earlier study. QLEDT was administered to all students, and 57 valid responses (20 male and 37 female students) were received towards the end of the course. The results indicated that students' interactive collaboration and integrative learning experiences were all above 4, following 5-point Likert Scale. Results of t-test indicated that male and female students showed no significant differences, indicating students perceived their learning experiences similar. By coding 57 students' reflections on design thinking project, there were eight areas of competence identified: teamwork, interpersonal communication, thinking for the needs, data collection and integration, selection of feasible solutions, innovative thinking from different perspectives, hands-on, and logical thinking.

The study helped the instructor make reflections on modifying the course design for further improving students' learning. The findings provide valuable suggestions and challenges teachers may face in using design thinking in their classroom practices.

Keyword: Design Thinking, Learning Effectiveness, Psychology, Reflection

Session: B4	16:40-18:00 | 29-Aug-2019	Meeting Room B
Session Chair: Dr. Linlin Zhao		ICEL

ICEL_0071

Building blocks for success: Unpacking information and digital literacy for doctoral research training

Linlin Zhao, Monash University, Australia

ICEL_0094

Mechanisms for Ensuring the Quality of Professional Certificates in Taiwan's Construction Industry

Hsiao-Shen Wang, National Taipei University of Technology, Taiwan

ICEL_0107

Comparison upon Policy and Practice of Manpower Development of Japan, Korea, Singapore, and Taiwan and Its Implication

Wang Cheng-Yen, National Kaohsiung Normal University, Taiwan

Building blocks for success: Unpacking information and digital literacy for doctoral research training

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Abstract

Marked by digital immersion, connectivity and information deluge, the digital age has not only contributed to an increasingly competitive global research environment, but has also profoundly reshaped doctoral researchers' information behaviours and highlighted their emerging information needs. To thrive in the current climate, doctoral researchers need to develop high-level information and research skills, ranging from discovering and using diverse information sources, conducting and participating in research and professional activities through varied digital systems, communicating and disseminating scholarship via a range of digital media, collaborating in digital networks, and lifelong learning of emerging technologies, to building and managing professional and academic identities within the digital environment.

As a strategic partner in research and education, Australian academic libraries are known for their strong tradition of supporting doctoral research training. Although many universities are re-strategising their doctoral training programs to adapt to the changing landscape, questions remain regarding the sufficiency of traditional library information literacy programs in addressing the emerging needs of contemporary doctoral researchers. Academic libraries and librarians are challenged to design and deliver library research support programs that 1) meet doctoral researchers' information needs in the digital environment; 2) facilitate lifelong learning of information and research skills; 3) empower both doctoral researchers and academic librarians through practice; and, most importantly, 4) are supported by research and evidence. To design the desired programs requires a deep understanding of information and digital literacy in the context of research and research training.

This paper investigates the emerging information needs of doctoral researchers, examines what constitutes digital literacy for researchers, and analyses the relationship between information literacy and digital literacy in the context of research and research training.

Through a systematic mapping review, the paper identifies a significant gap in the seemingly large body of current literature on digital literacy, i.e., the lack of research on digital literacy in the context of research and research training. The paper then proposes a conceptual model of digital literacy for researchers to assist academic librarians with developing desired library research support programs. The model is inspired by Jisc's seven elements of digital literacy model, Paul Glister's underpinning knowledge and the three dimensions of learning identified by the Australian Quality Framework Level 10 (Doctoral Degree graduate outcomes). The model lays the foundation for a research project investigating the processes and issues of designing a digital-focused library doctoral research support program and contributes to the growing understanding of information and digital literacy in the context of research and doctoral research training

Keyword: Higher Education, Lifelong Learning, Information and Digital Literacy, Doctoral Research Training

Mechanisms for Ensuring the Quality of Professional Certificates in Taiwan's Construction Industry

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Abstract

Professional certificates verify the technical skills of professionals and technical personnel and imply that they possess professional ethics. According to statistical data, the gross enrollment ratio for higher education in Taiwan was nearly 85% in 2017, which indicates that college certificates and university diplomas are no longer an indicator of students' distinctive technical skills. Consequently, industries have begun to pay more attention to using professional certificates for assessing students' technical skills and recruiting technical personnel. Major countries around the world have dedicated themselves to establishing and implementing professional certification systems. By contrast, Taiwan has yet to improve its poor professional certification systems. This study analyzed professional-certificate-related rules and regulations as well as the methods of implementing these rules and regulations by examining related laws, literature, and official documents. Subsequently, this study investigated the professional skills of professionals and technical personnel who had received professional certificates and offers recommendations to ensure that such certificates match the professional skills required by industries. Construction covers a wide range of fields, such as technology, labor, and building materials and equipment. To ensure the quality of professional certificates, industry-, education-, and labor-related authorities, associations, and societies should work together to establish professional standards and certification systems. Moreover, technical and vocational schools and training institutions should be used to retrain professionals and technical personnel holding professional certificates. Finally, technical and vocational education institutions should establish professional skill standards and professional certification systems and plan their courses accordingly.

Keyword: Construction Industry, Professional Certificates, Quality of Professional Certificates, Professional Skills

Comparison upon Policy and Practice of Manpower Development of Japan, Korea, Singapore, and Taiwan and Its Implication

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Abstract

The quality of manpower is the core of competitiveness of a country and also the major target of adult continuing education. The paper focuses on four Asian countries, Japan, Korea, Singapore, and Taiwan to compare their policy of manpower development. The aims of the paper are as follows: 1. to reveal the similarity and difference of policy of the four countries. 2. to explore the implication of policy to adult continuing education. 3. to make recommendations to other countries according to the findings. Documentary analysis and semi-structure interview were both applied chronologically. Documentary analysis was used to analyze the central governmental websites and publications of the four countries. An instrument of two-way cross table was used to analyze the different documents. Triangle examination was conducted by the author, a research assistant and an invited expert to make sure the validity and reliability of content analysis. There were three interviewees intentionally sampled from policy-makers and practitioners in each country via the semi-structured interview outline. The content of interview was analyzed via NVivo edition 10, a package of software, for dealing with qualitative data. Implication and accordingly recommendation would be raised for related policy-makers, practitioners and following researchers.

Keyword: A Comparison of Japan, Korea, Singapore, and Taiwan, Policy-making, Manpower development, Adult continuing education

Session: B6	11:10-12:30 | 30-Aug-2019	Meeting Room B
Session Chair: Dr. Chi Kin Mak		ICEL

ICEL_0065

Effects of Robotics-based Learning Activities on Critical Thinking Skills of Sub-degree Engineering Students

Kin Sang Eric WOO, The Hong Kong Polytechnic University, Hong Kong

Sun Pui NG, The Hong Kong Polytechnic University, Hong Kong

Chun-kit Wilson KWAN, The Hong Kong Polytechnic University, Hong Kong

ICEL_0082

The Connotion and Teaching Practice of Children's Aesthetic Education

Yu-pei Hu, Luoyang Normal University, China

ICEL_0086

On Randomisation of Linear Algebra Questions in E-assessment

Chi Kin Mak, University of New South Wales, Australia

ICEL_0093

Lure of Artificial Intelligence: Learning A Foreign Language with Intelligent Language Tutoring Systems (ILTSs)

Nil Goksel, Anadolu University, Turkey

Effects of Robotics-based Learning Activities on Critical Thinking Skills of Sub-degree Engineering Students

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Abstract

Community colleges play a key role in the Hong Kong education system. Critical thinking is an essential attribute for graduates to further their study and career. Over the years, some useful pedagogical strategies for enhancing critical thinking have been developed in various disciplines but may not be specifically designed for engineering students. Along with the rapid growth of STEM education, a robotics workshop has been proposed to facilitate the critical thinking of engineering students in Hong Kong Community College (HKCC) of the Hong Kong Polytechnic University. Through different robotics-based learning activities, students not only gain the basic knowledge and hands-on experience in robotics, but also apply them in solving a designated task in real practice on their own. After the workshop, all students were able to provide critical counter suggestions of modifying the robot in order to accomplish the given challenging task with ease or in shorter duration. Having summarized all the solutions attempted by the students, it was observed that the current challenging task allowed them to think of lots of possibilities in various dimensions. It was also proven that this kind of robotics activities has great potential to further students' critical thinking ability.

Keyword: STEM, robotics, critical thinking, community college

The Connotion and Teaching Practice of Children's Aesthetic Education

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Abstract

Cultivating the aesthetics of young children is the trend of education in the world, and also an important decision for China's education reform. Children's aesthetic education is an education that satisfies children's aesthetic emotional needs and develops aesthetic ability as well as creative ability. Analyzing and summerizing the core value of relevant theories as well as Chinese and foreign literatures, the author proposes the aesthetic education connotation, teaching stage, teaching strategy and learning evaluation which suit Chinese cultural literacy education. The learning connotation of children's aesthetic education is built on the five core literacy of the visual arts discipline. It develops a teaching program which has "aesthetic-experience as orientation and MBAE (Multiculture Discipline-based Art Education) as learning content". It trains young children in learning activities of "feeling and practicing", "aestheticising and creating" to have the aesthetics ability to enjoy, create, appreciate and apply beauty, and to have rich aesthetic experiences in order to foster aesthetic literacy. This paper also proposes six teaching stages of children's aesthetic education: " aesthetic perception", " aesthetic imagination ", " aesthetic understanding", " aesthetic sentiment", " aesthetic creativity ", "reflection and evaluation" ,with the corresponding teaching strategies. It discusses the meaning and evaluation tools of the "authenticity evaluation", as well as the methods and the way of describing to formulate the evaluation content according to the learning objectives. It provides the guidelines for teachers to write teaching materials and the specific methods for implementing teaching.ultivating the aesthetics of young children is the trend of education in the world, and also an important decision for China's education reform. Children's aesthetic education is an education that satisfies children's aesthetic emotional needs and develops aesthetic ability as well as creative ability. Analyzing and summerizing the core value of relevant theories as well as Chinese and foreign literatures, the author proposes the aesthetic education connotation, teaching stage, teaching strategy and learning evaluation which suit Chinese cultural literacy education. The learning connotation of children's aesthetic education is built on the five core literacy of the visual arts discipline. It develops a teaching program which has "aesthetic-experience as orientation and MBAE (Multiculture Discipline-based Art Education) as learning content". It trains young children in learning activities of "feeling and practicing", "aestheticising and creating" to have the aesthetics ability to enjoy, create, appreciate and apply beauty, and to have rich aesthetic experiences in order to foster aesthetic literacy. This paper also proposes six teaching stages of children's aesthetic education: " aesthetic perception", " aesthetic imagination ", " aesthetic understanding", " aesthetic sentiment", " aesthetic creativity ", "reflection and evaluation" ,with the corresponding teaching strategies. It discusses the meaning and evaluation tools of the "authenticity evaluation", as well as the methods and the way of describing to formulate the evaluation content according to the learning objectives. It provides the guidelines for teachers to write teaching materials and the specific methods for implementing teaching.

Keyword: Children's aesthetic education, Preschool visual art teaching, Aesthetic experience, Aesthetic ability

On Randomisation of Linear Algebra Questions in E-assessment

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Abstract

E-assessment is widely used across all levels of education institutes for programs, courses and subjects. It is welcome by students, staff, institutions for various reasons including flexibility, instant feedback, saving of resources, etc. It is used for both formative and summative assessments. An important objective of low-stakes formative assessments is to help the students learn rather than to assess how well the students learn. Student can access the tests from anywhere in their preferred time. For summative assessment, the test or exam may have to be run in test centres under supervision by invigilators. Alternatively, they can be run using remote invigilation.

It is clear that unless an e-assessment is run at the same time and same place. For both the formative and summative assessments, the LOFT (linear-on-the-fly testing) model needs to be implemented. LOFT generates a unique version of the examination for each student and all versions should have the same level of difficulty and assessing the same objectives. There could be two ways to achieve that, creating a large pool of questions or creating questions with random fields. Either ways, we need to ensure the validity (we are testing what we want to assess) and reliability (all versions should be consistent in level of difficulties and students performance should not be affected by taking different versions).

It is challenging to generating random fields for e-exam questions on Linear Algebra or generating large number of questions of similar assessment objectives. For instance, in questions asking students to find the inverse of a given matrix, whether the entries of the inverse are all integers or some of them are complicated fractions will make a big difference for students.

In this paper, we shall discuss various methods of generating random vectors and matrices for questions in e-assessment with consistent level of difficulty in different versions.

Keyword: Linear Algebra, E-assessments, Randomization, Validity, Reliability

Lure of Artificial Intelligence: Learning a Foreign Language with Intelligent Language Tutoring Systems (ILTSs)

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Abstract

There have been path-breaking developments in technology, which are considered to be essential to ease human lives in terms of health, informatics, business and most strikingly education. These developments specifically in education become inevitable and need to get close attention. Artificial Intelligence, with a technological system that can learn on its own, has become capable of pretending humans with its prominent features designed upon Machine Learning, Deep Learning and Natural Language Processing. When machine-human interaction is predicted to be long-term, it seems possible to use Artificial Intelligence based systems that can be utilized actively to learn and teach a foreign language. With its language recognition features, Artificial Intelligence supported Intelligent Language Tutoring Systems, may assist learners to gain receptive skills like reading-listening, and productive skills like writing-speaking. These intelligent systems can identify language errors and provide immediate feedback within the scope of Open and Distance Learning. In this connection, the central aim of this study is to review the working system of Intelligent Language Tutoring Systems (ILTSs) and to examine the potential use of Artificial Intelligence in foreign language learning.

Keyword: Artificial Intelligence, Intelligent Language Tutoring Systems (ILTSs), Open and Distance Learning (ODL), foreign language learning

Session: B7	13:20-14:40 | 30-Aug-2019	Meeting Room B
Session Chair: Dr. Simon Wong		ICEL

ICEL_0054

Assessing Graduates' Employability: Indicators of Employability

Amitha Padukkage, University of Sri Jayewardenepura, Sri Lanka

ICEL_0061

A Comparative Study on the Learning Performance from Multimedia Learning on a Sorting Algorithm

Simon Wong, The Hong Kong Polytechnic University, Hong Kong

Pat Chan, The Hong Kong Polytechnic University, Hong Kong

Ken Tsang, The Hong Kong Polytechnic University, Hong Kong

Joseph So, The Hong Kong Polytechnic University, Hong Kong

Anthony Loh, The Hong Kong Polytechnic University, Hong Kong

ICEL_0062

An Online Evidence-based Assessment System to Promote Collaborative Learning in Tertiary Education

Winnie W. M. Lam, The Education University of Hong Kong, Hong Kong

Dennis Y. W. Liu, The Hong Kong Polytechnic University, Hong Kong

Issac K. H. Lo, The University of Hong Kong, Hong Kong

ICEL_0069

Effectiveness of Dialogue Based Intelligent Tutoring System on Learning Mathematics: Learning Gains and Affective Domain

HueyMin WU, National Academy for Educational Research, Taiwan

HsinJung Yu, National Taichung University of Education, Taiwan

Assessing Graduates' Employability: Indicators of Employability

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Abstract

A recent trend in higher education in Sri Lanka has been to produces highly employable graduates with internationally recognized qualification. Several steps including implementation of quality assurance programme, accreditation with professional bodies and implementing Sri Lankan qualification frameworks have been taken to improve the employability of graduates and quality of the degree programmes by the governing bodies of education in Sri Lanka. Despite the increasing focus on academic standards, quality and graduate employability, there is still a distinct absence of a valid screening tool to test the level of work readiness of the university students before they are awarded their degrees. Therefore, the objective of this research was to identify the graduate employability indicators and empirically test the indicators using three perspectives - gradates' perspective, employers' perspective and lecturers' perspective. Fourteen indicators were identified through the literature review. The indicators were empirically tested through a survey data collected form 140 participants. The paper reports on the development of the graduate employability indicators and applicability of indicators for graduates, employers and lecturers on the importance of 14 employability capabilities. Summary on the three perspectives demonstrate the similarities and deviations of each capability. The results reveal the level of competent required and key capability elements to developing employable graduate. Therefore, mastered and competence in employability capability elements are very important in order to produce highly qualified and competitive graduates.

Keyword: Graduate Employability Indicators, Higher Education, Employability

A Comparative Study on the Learning Performance from Multimedia Learning on a Sorting Algorithm

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Abstract

This paper presents the comparative study on the retention and transfer performance of the students studying a sorting algorithm with the use of two different multimedia materials – (1) narrated animation and (2) narrated animation with highlighting text. In this study, each of the two 70-student independent groups was assigned to view either one of these two multimedia materials. After viewing, these two groups took an identical test in order to obtain their test marks which reflect their retention and transfer performance. The two groups' mean test marks were compared and analyzed by t-test to find whether the students can learn better from (1) narrated animation or (2) narrated animation with highlighting text. This study is significant in the sense that it tests the redundancy principle proposed by Mayer (2009), provides reference for developing learning-effective multimedia materials and forms the basis for explanation or theory-generating in further studies. The analytical results reveal that there was no significant difference between the students' mean test marks with $t(138) = 0.2$ and $\rho = 0.842$ (two-tailed) across the two groups. These results indicate a different view from Mayer's (2009) redundancy principle and assert that the additional printed text should not be regarded as a redundant in multimedia learning.

Keyword: Multimedia learning, Narrated animation, Retention performance, Transfer performance, Java programming course, Insertion sort

An Online Evidence-based Assessment System to Promote Collaborative Learning in Tertiary Education

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Abstract

Collaboration between students is particularly important in tertiary education because most courses include group activities in which they need to work together to reach a common goal. Unlike individual learning, collaborative learning involves interaction and cooperation. However, it is difficult to assess individual contributions in a group. Teachers usually collect the final product and give the same mark to all members in the group, so this may cause unfair marking and lead to conflicts in case of uneven workload. To encourage student collaboration and provide a reliable assessment system for teachers, we proposed an online evidence-based assessment system called GMoodle (https://gmoodle.eduhk.hk) with the Teaching Development Grant (TDG-T0210) in the Education University of Hong Kong (EdUHK). GMoodle provides the basic functions of Moodle plus customized features including chatroom, Wiki and real-time progress report. It is a centralized platform for students to discuss, share resources and work out the solution together. Detailed reports, such as the number of posts/replies, weekly trend of contribution, ranking in group and class, can be retrieved by both students and teachers. The objectives of this system are to promote active and collaborative learning environment through peer motivation and facilitate an evidence-based assessment for setting assessment criteria and identifying free-riders. GMoodle was launched from September 2018 to April 2019 with 337 users involving 10 courses in IT, Mathematics, English language and law in EdUHK. Quantitative and qualitative data were collected from pre/post-test survey, system log and focus group interviews. The effectiveness of GMoodle on group collaboration and assessment was evaluated by statistical analysis by SPSS using ANOVA and t-test. The results showed that the improvement of problemsolving skills and collaborative skills were statistically significance. Furthermore, decision tree was used to discover interesting learning patterns to explore significant factors of active collaboration. The results can be served as practical advice to arouse students' activeness and help teachers to assess collaborative activities fairly and transparently.

Keyword: GMoodle, Collaborative learning, Group assessment, Online evidence-based, Tertiary Education.

Effectiveness of Dialogue Based Intelligent Tutoring System on Learning Mathematics: Learning Gains and Affective Domain

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Abstract

Dialogue-based teaching could elicit a deep understanding for students and offer instructors flexibility in adapting the presentation of the material to meet the need of the individual student. Although tutorial dialogue holds the potential for improving the effectiveness of instruction, it also comes with a cost in time-consuming and human resource. If the system could help students actively construct knowledge with conversations, it would promote the learning performance of the students. Autotutor is an intelligent tutoring system that simulates a human tutor by holding a conversation with the learner. However, fewer studies related to dialogue-based intelligent tutoring system have focused on Chinese and mathematics topics. A Chinese dialogue-based intelligent tutoring system in mathematics is developed in this study. The research questions are:1) Is the learning gains of the dialogue-based intelligent tutoring system more effective than that of traditional group remedial instruction? 2) Is there any difference in the affective domain between the experiment group with dialogue-based intelligent tutoring system and the control group with traditional group-based remedial instruction? The pre-test/post-test nonequivalent group design was adopted in this study. Analysis of covariance (ANCOVA) is used to detect significant differences between the experiment group and the control group in terms of the learning gains and affective domain. The learning gains are the test score on post/pre-test related to the Pythagorean Theorem. The affective domain was measured by the questionnaire. Two classes from the eighth grade of Taiwanese junior high school were selected to participate in the field experiment in this study. For the question(1) Is the learning gains of the dialogue-based intelligent tutoring system more effective than that of group-based remedial instruction? The results of the ANCOVA indicated that the difference between students' post-test scores due to the group allocation was significant. The adjusted R Squared value in ANCOVA was .98. After the post-test scores were adjusted, the mean post-test score for the dialogue-based intelligent tutoring system group was 83, which was higher than the score of the control group (61). For the question (2) Is there any difference in the affective domain between the experiment group with dialogue-based intelligent tutoring system and the control group with traditional group-based remedial instruction? The results of the ANCOVA indicated that the difference in the learning interesting between experiment group and control group was significant. Students have higher interesting in learning mathematics with the dialogue-based intelligent tutoring system. Students who received a dialogue-based intelligent tutoring system outperformed those who received the group-based program.

Keyword: Dialogue, Intelligent Tutoring System, Mathematics, Pythagoras

Session: B8	**15:00-16:20 | 30-Aug-2019**	**Meeting Room B**
Session Chair: Dr. Kevin Burden		**ICEL**

ICEL_0038
Developing and Evaluating Innovative Mobile Pedagogies: The DEIMP Project

Kevin Burden, University of Hull, UK

Sandy Schuck, University of Technology Sydney, Australia

Peter Aubusson, University of Technology Sydney, Australia

Matthew Kearney, University of Technology Sydney, Australia

ICEL_0046
The Global Perspective of Undergraduate Freshmen in Hong Kong

Annie W. Y. Ng, The Hong Kong University of Science and Technology, Hong Kong

Chung-Yee Lee, The Hong Kong University of Science and Technology, Hong Kong

ICEL_0078
Measuring student engagement and learning experience for quality assurance in higher education

Lily Min Zeng, The University of Hong Kong, Hong Kong

Luke Fryer, The University of Hong Kong, Hong Kong

Maggie Yue Zhao, The University of Hong Kong, Hong Kong

ICEL_0089
Problem-solving emphasizing on sense-making: through come-and-go between social and mathematical context

George Gotoh, Niigata University, Japan

Developing and Evaluating Innovative Mobile Pedagogies: The DEIMP Project

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Abstract

As mobile technologies become more multi-faceted and ubiquitous in society, it becomes important for educators to become competent and confident in using these technologies for teaching and learning. Mobile learning is the term used to describe the learning that exploits the potential of such technologies. While a growing body of evidence shows that traditional pedagogies still dominate the educational field, there are diverse learning opportunities offered by the use of mobile technologies and mobile pedagogies, that is pedagogies using mobile devices for teaching and learning. Mobile pedagogies are those pedagogies that make use of the specific characteristics of mobile devices, supporting learning that is authentic, collaborative and personalised (see Kearney, Schuck, Burden & Aubusson, 2012). Emerging digital pedagogies have a potential to be innovative and possibly disrupt notions of schooling. Their affordances, if exploited may shape when, where and how education of the future occurs. We need to consider fresh approaches more attuned to the flexibility and agility of mind required by a world in perpetual, technological transition. For example, the rigid subject matter dominating prescriptive curricula, the fixed scheduling of class times, the bounded formal learning in classrooms, all seem at odds with the tapestry of innovation that drives prosperity, and new knowledge as well as the communication and social integration that characterise modern progressive societies. In this presentation, we present an overview of an ongoing European Erasmus+ project focused on the design and evaluation of innovative mobile pedagogies (DEIMP) (see www.deimpeu.com). This presentation introduces the aims of the DEIMP project, outlines a scoping study done as the first component of the study and then discusses the developments leading from the scoping study that culminate in a MOOC and mobile app to assist teachers to implement innovative mobile pedagogies in their teaching. The aim of the DEIMP project is to clarify principles underlying innovative mobile pedagogies, then to support teachers in understanding these principles to inform their own innovative learning task designs, to trial with their students. These principles were derived from the scoping study, which used a Systematic Literature Review (SLR) and Best/Worst Scaling Study (BWS). They were used in the MOOC development and the MOOC informed teacher construction of learning activities that are showcased on the mobile app. Results of the project to date will be discussed.

Keyword: Mobile learning, Digital pedagogies, School futures, Innovative teaching approaches

The Global Perspective of Undergraduate Freshmen in Hong Kong

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Abstract

Multinational corporations focused more on the global perspective of graduates with the capability of traversing cultural boundaries. Universities are working to build up their students' knowledge, concepts and attitudes on global perspective to help them facing the challenges of a global society and job market. To better facilitate institutions in cultivating global perspective for students while embarking on their university study journey, understanding the global perspective thinking of incoming first-year students is necessary. By using the Global Perspective Inventory (GPI), this study examined the global perspective-taking of undergraduate freshmen from different regions at an international university in Hong Kong. The results showed that both local and non-local students obtained the lowest score on interpersonal social interaction amongst the six global perspective scales. Cognitive knowing, cognitive knowledge and intrapersonal affect scales indicated that the local students and non-local student groups (America and Europe, East Asia, South Asia, Southeast Asia, and mainland China), in general, possessed knowledge of multicultural issues and respected and accepted of cultural difference. However, as compared with the norm, the local students were significantly lower in all the three scales. Intrapersonal identity and interpersonal social responsibility scales reflected that the local students and non-local student groups possessed acceptance of culture different from their own and social concern for other. But they all scored significantly lower than the norm. Overall, this study indicated that there was still room for improvement in global perspective thinking for incoming undergraduate freshmen. Possible strategies for nurturing various dimensions of global perspective in students were discussed.

Keyword: Global Perspective, First Year Undergraduates, International Students, Institutional Research, Student Evaluation

Measuring student engagement and learning experience for quality assurance in higher education

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Abstract

The rapid expansion of higher education results in ever growing social expectations on the education outcomes and widespread concerns among the stakeholders of the sector about the quality of higher education. As part of the response to such concerns, institutional or national surveys based on different theories are widely used in higher education institutions for quality assurance and benchmarking among universities. Two major schools of theory, student engagement and student learning experience, have guided the development of such instruments in the USA, Australia, UK, Hong Kong, and Mainland China. The measurement of student engagement is multifaceted and differs slightly in the selection of constructs in different regions. Some scholars have criticized student engagement as being too focusing on behavioural engagement and creating a situation where distinguishing whether some constructs represent behavioural engagement and whether they are actually the results of students' university experience. The measurement of student learning experience is based on how students experience certain features of courses or programmes and their relationship with the approaches students take to their studies. While researchers have argued for the importance of focusing on measurement at the programme level for the quality assurance, it is hard for individual teachers to draw implications from such surveys for quality enhancement. Learning is an incremental process. Measuring good practices at programme level provides little information for instructional decisions regarding individual teachers impact. This paper reviews the definitions of engagement and student learning experience, discusses the major theories shaping the development of such surveys, analyses the dimensions evaluated, discusses the challenges faced when using such instruments for quality assurance in different educational contexts, proposes an alternative approach to commencing quality assurance at individual teacher level, and calls for richer characterizations of student engagement and learning experience.

Keyword: Student Engagement, Student Learning Experience, Higher Education, measurement

Problem-solving emphasizing on sense-making: through come-and-go between social and mathematical context

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Abstract

In today's highly advanced information society, attitudes to utilize mathematics is important, not only for experts, but also for an autonomous global citizens continuing to learn throughout life. This paper reports on learning that emphasizes activities interpreting the meaning and relation between social context and mathematical context included in the problem by paying attention to how to use mathematics. That kind of learning is focusing on how mathematics can be used in familiar situations, and is as a basis of learning "mathematical method" such as the way of thinking used in mathematics and way of utilizing mathematics.

In class, we tried to review the meaning of using mathematics in everyday situations and rethink mathematically the problems of everyday life so that we are aware of mathematical involvement in concrete problem scenes. This aims to acquire the ability to read and write mathematical expressions (formula, table, and graph), the ability to utilize it, and the ability to utilize mathematics in realistic problems, by come-and-go between mathematics world and everyday world, so as to recognize the usefulness of mathematics.

Looking at a couple of examples of this kind of learning, it is suggested that it is effective to present problems that can be interpreted diversely through comparative examination of a number of solutions, and incorporate group work appropriately. And it is also an important task to accumulate teaching materials and practical examples and to develop frameworks related to lesson design and evaluation.

Keyword: Problem-Solving, Sense-Making, Mathematical literacy, Context, University education

ICEL_0043

Ordinal Logistic Regression Analysis for Grade Analysis of Calculus

Sirichan Vesarachasart, Thammasat University, Thailand

Roumporn Sittimongkol, Thammasat University, Thailand

ICEL_0049

Self-developed English Grammar App on College Students' SelfRegulated Learning Motivation: an Action Research

Bor-Tyng Wang, Feng-Chia University, Taiwan

ICEL_0064

The influence of the POED scientific inquiry and practice learning model on students' learning performance and hands-on ability

Jyun-Chen Chen, National Academy for Educational Research, Taiwan

Yi-Wei Lin, National Academy for Educational Research, Taiwan

ICEL_0088

Dialog-based Mathematics Intelligent Tutoring System with Two Agents for learning Multiplication and Division of Fraction

Shu-Chuan, Shih, National Taichung University of Education, Taiwan

Shao-Ci, Wang, National Taichung University of Education, Taiwan

ICEL_0090

The Relationship between School Satisfaction of Special Teachers and Educational Community Competencies

Soon-Young Hwang, Pusan National University, Korea

Se-Jin Cha, Pusan National University, Korea

Session: Room Sakura (east) 3   **15:00-16:20 | 29-Aug-2019**   **Meeting Room Sakura (east) 3**

Poster: ICEL

ICEL_0096

A Study on the Actual Condition and Perception of Leisure Activities of the Adult with Disabilities

Hwanga Soon Young, Pusan National University, Korea

Kim Myeong Ju, Pusan National University, Korea

ICEL_0101

A CRA-based Number Sense Teaching Program to Improve Number Sense and Math Achievement for Slow Learners

Kim, Jakyoung, Busan National University, Korea

Kang, Hyejin, Kwangju women's university, Korea

Seo, Juyoung, Education, Donga University, Korea

ICEL_0102

Investigation and Development of Story-Based Remedial Instructional module for Learning Geometry

Ju-Fen Yao, National Chia-Yi University, Taiwan

ICEL_0104

Conversation-based assessment with Virtual Simulations to Enhance Scientific Literacy

Chih-Wei, Yang, National Taichung University of Education, Taiwan

Shih-Man, Lin, National Taichung University of Education, Taiwan

Yi-Ping, Liu, National Taichung University of Education, Taiwan

Chen-Chung Liu, National Central University, Taiwan

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Ordinal Logistic Regression Analysis for Grade Analysis of Calculus

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Abstract

A Study on Ordinal logistic regression analysis for grade analysis of calculus aims to find the factors affecting Calculus II grade and the probability of a grade in Calculus II for students in the Department of Mathematics and Statistics, Thammasat University. The information of 197 students enrolled in Calculus II course in the 2nd semester of the academic year 2016 including student number, name, gender, year of study, major, Calculus I grade and Calculus II grade were collected and analyzed through the Ordinal logistic regression analysis procedure by using SPSS for Windows. The Ordinal logistic regression analysis revealed that the years of study, major and grades in calculus I influence Calculus II grade up to 58.9 percent.

Keyword: Ordinal logistic regression analysis, Calculus grade, Department of Mathematics and Statistics, Thammasat University

Self-developed English Grammar App on College Students' SelfRegulated Learning Motivation: an Action Research

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Abstract

In response to the promotion of the 12-year national curriculum by the Ministry of Education and the emphasis on literacy orientation in Taiwan, higher education should be timely connected to cultivate students' ability to learn independently and solve problems in the future. However, independent learning is not just students' individual learning, and independent learning is not an intrinsic ability, either. On the contrary, teachers play a crucial role in training students to "learn how to learn." Teachers use different teaching strategies to enhance students' interest in learning, so as to guide students' thinking and then construct an understanding model. In addition, Taiwan has long positioned English as a foreign language. In this EFL environment, the focus of teaching is to train students' functional expression, so English grammar continues to play an important role in teaching. However, there are many differences between Chinese grammar and English grammar. How and when to generate grammatical awareness in a second language is still a topic worthy of attention. Therefore, the study proposed to use the self-developed grammar App to enhance students' self-regulated learning motivation. The researcher designed a set of English grammar App suitable for first-year English beginners by using the content of the textbook, and through the diagnosis of the grammatical structure, it provides the adaptive learning grammar path to the learners. In the end, students are expected to increase their learning motivation and develop the habit of autonomous learning of English grammar.

Keyword: literacy orientation, English grammar, App, Self-regulated learning, Adaptive learning

The influence of the POED scientific inquiry and practice learning model on students' learning performance and hands-on ability

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Abstract

In Taiwan, enhancing students' scientific inquiry and practice ability was emphasized in the Curriculum Guideline for 12-year Basic Education Program. However, there are more difficult abstract concept in science subject, and it were the reasons cause students' misconceptions. Besides, more than fifty percent students have almost no hands-on practicing experiences, and the others have some recipes way experiments. Students lacked the scientific inquiry, application knowledge and hands-on making learning materials. To solve the problems, this study developed a PredictionObservation-Explanation-Doing (POED) scientific inquiry and practice learning model for enhancing students' learning performance. The POED learning model was implemented in a fuel cell vehicles course with STEM (Science, Technology, Engineering, and Mathematics) activities and cloud-based learning system to execute a pilot study. It would help junior high school students improve their interdisciplinary knowledge, thinking ability, problem solving ability, hands-on making ability, and scientific inquiry and practice ability. The study will implement a quasi experimental design to examine whether the students who learned using the POED learning model demonstrated better learning performances regarding the comprehension of abstract scientific concepts and scientific inquiry and practice ability. The experimental process will conduct over a period of 10 weeks for a total duration of 900 min. The fuel cell vehicles course include three parts: the power of fuel cell, the mechanism of gearwheel, and the structure of car body. The expected results will be that all of the students improved their comprehension of abstract scientific concepts and scientific inquiry and practice ability.

Keyword: Scientific inquiry and practices, Cloud-based learning system, STEM, POE inquiry learning model.

Dialog-based Mathematics Intelligent Tutoring System with Two Agents for learning Multiplication and Division of Fraction

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Abstract

Intelligent tutoring systems (ITS) incorporate artificial intelligence techniques in order to construct an effective learning environment adapted to students' needs. Previous studies have indicated that ITSs as a system have a greater potential than CAI to help students overcome difficulties in solving mathematics problems. At present, the most common design of ITSs is a one-on-one tutoring approach, that is to say, the human student interacts with only one agent. There are few studies adopting the design of trialogues. Trialogues provide some advantages over dialogues, e.g., modeling social interaction. Hence, the purposes of this study were to develop a one-to-two ITS for learning multiplication and division of fractions and evaluated the effectiveness of the system. The conversational design of math ITS in this study was constructed by simulating the trialogue algorithms and pedagogical strategies of an experienced human tutor, a peer and a human student. Two agents were a tutor agent and a peer agent. The pedagogical model of conversational trialogues was based on Graesser, Forsyth and Lehman (2017). Furthermore, the learning content focused on fraction multiplication and division that was considered more difficult for elementary students. There are ten learning topics related to fraction multiplication and division developed in this math ITS. In order to evaluate the effectiveness of the proposed math ITS, the one-to-two ITS group was compared to the one-on-one ITS group and the traditional classroom instruction group, a quasi-experiment was conducted. The pretest and post-test were parallel tests which performed with 25 items involving fraction multiplication and division word problems. There were 120 grade 6 students participated in the experiment, 40 students in one-to-two ITS group, 42 students in one-on-one ITS group, and the others (38) in traditional classroom instruction group. The result of ANCOVA showed that the performance of one-to-two and one-on-one ITS groups were both significantly better than that of traditional classroom instruction group. However, there was no significant difference between two ITS groups.

Keyword: Intelligent Tutoring System, Mathematics Remedial Instruction, Conversational Trialogues, Multiplication and Division of Fraction

The Relationship between School Satisfaction of Special Teachers and Educational Community Competencies

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Abstract

Special teachers who teach students with various disabilities may have negative effects on psychological burnout and school satisfaction because they do a lot of things from class to life management and life maintenance. And the educational community is growing as one of the ways to mediate the difficulties in teaching life. In this study, we analyzed the relationship between special teacher 's perception of school community competence and school satisfaction, and examined the possibility of educational community as a way to support special teachers. The questionnaire was composed of 33 items including 4 general information items and 28 educational community competency items. The reliability of the questionnaire is Cronbach's α coefficient 0.97. The subjects of the study were 248 special teachers in Korea. Pearson correlation analysis and oneway ANOVA were performed. As a result of the study, 81(32.7%) special teachers answered 81-90 points, 62(25.0%) special teachers 71-80 points, and 55(22.2%) special teachers 91-100 points. There was a statistically significant relationship between school satisfaction and perception of educational community competence($r=.312$, $p< .01$), and there was also a difference in perceived educational community competence according to school satisfaction ($F=7.76$, $p<.001$). Based on the above results, it can be suggested that the educational community can support the psychological burnout of teachers and improve the school satisfaction.

Keyword: Special teacher, School Satisfaction, Educational Community

A Study on the Actual Condition and Perception of Leisure Activities of the Adult with Disabilities

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Abstract

As interest in leisure has recently increased, participation in leisure activities can be seen as a process of promoting social relations and improving the quality of life beyond the merits of mood and relaxation activities. However, the leisure needs of people with disabilities are as strong as those of non-disabled people, but the program participation rate of people with disabilities is low due to the programs operated by the general public. The purpose of this study is to investigate the actual conditions and perceptions of leisure activities of adults with disabilities and to provide basic data for systematically searching for problems and perceptions through survey results and systematically searching for necessary measures. The questionnaire was composed of 25 items including 3 items related to background variables, 9 items of leisure activity, and 13 items of leisure activity recognition. The subjects of this study were 270 Korean adults with disabilities. Frequency analysis was performed through the SPSS 23.0 program. If you look at the status of leisure activities first, the most frequently participated leisure activities were in order of categories: type (redundant response), rest and change of mood (n=534, 98.9%), hobbies and entertainment (n=381, 70.6%), and social participation•others (n=379, 70.2%). Regarding the degree of participation in leisure activities, the respondents were the most active (n=124, 45.9%), and the respondents were the average (n=110, 40.7%) to see if the cost of leisure activities was sufficient. With the perception of leisure activities, the respondents showed high interest in leisure activities (n=133, 49.3%), necessity (n=190, 70.6%). The types of activities that I would like to do the most are the respondents to tourism, hobby, and entertainment, with 96 (17.8%) respectively. However, most of the respondents 64(44.6%) said that they did not need leisure activities because most of them did not. These results suggest the necessity of various leisure service and program development considering the individual characteristics of disability type and personal needs.

Keyword: Adult Disabilities, Leisure Activities, Leisure Perception, Actual Condition

A CRA-based Number Sense Teaching Program to Improve Number Sense and Math Achievement for Slow Learners

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Abstract

The purpose of this study is to examine effectiveness of a Number Sense Teaching Program based on CRA (concrete-representational-abstract) for slow learners. 5 Slow learners (6-year-old) participated in the CRA-based Number Sense Teaching Program for 29 sessions during 5 weeks. Each session was made of introduction (5 min), main lesson (20 min), and wrap-up (5 min). The main lesson consisted of C (Concrete)-R (Representational)-A (Abstract) stages. Slow learners were measured with a Number Sense Test, developed by Kim et al. (2018) and the Number Subtest of KISE-BATT: Math (Basic Academic Achievement Test: Math), which is a standardized test of math achievement. The results from this study are following: First, the number sense of slow learners gradually improved during intervention. The non-parametric test was performed to compare the pre- and post-test scores of the number sense, and statistically significant changes were observed. Second, the non-parametric test was performed to compare the pre- and post-test scores of the math achievement in Number, and statistically significant changes were not observed. However, all children except one showed higher scores on the post-test than the pre-test on the Number Subtest of KISE-BAAT: Math. The results of this study show that the number sense intervention based on CRA is effective in improving the number sense of the slow learners.

Keyword: Number Sense, CRA, Math Achievement, Slow Learner

Investigation and Development of Story-Based Remedial Instructional module for Learning Geometry

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Abstract

Enhancing geometric thinking is very important for high level mathematical thinking and in daily life. Besides, educational equity is a core element and principle for school mathematics. In fact, mathematics for all has been internationally considered a key issue of mathematics education. This case study was a part of a project supported by the Ministry Of Science and Technology of Taiwan. The main purposes of this study were to develop story-based remedial instructional modules for elementary school students to learn geometry. Three elementary schools were involved in this research, and three story-based remedial instructional modules were designed for the participants, including "Similarity" for grade six, "Volume and Surface Areas" for grade five, and "Angles" for grade four. The researcher tried to help students understand geometry could be useful and beautiful, and learning geometry can be fun. Through analysis of observation, interviews, tests, and related documents, the findings indicated that students enjoyed learning geometry through these "story-based remedial instructional modules", and their mathematics achievements were improved. Then based on students' learning performance, the researcher revise and elaborate these modules. Hopefully, this research could create appropriate and happy environments for disadvantaged students to learn geometry.

Keyword: Elementary school, Geometry, Story-based remedial instructional module

Conversation-based assessment with Virtual Simulations to Enhance Scientific Literacy

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Abstract

This study investigates the effectiveness of a conversation-based assessments with computer agents combine with virtual experiment (http://cosci.tw/) on development of scientific literacy. There are two classes to participate in the buoyant force unit experiment. Data collected include the students' online assessment responses and worksheet that indicate inquiry processes, and pretest and posttest data that indicate scientific literacy. The result shows conversational-based situational problems may stimulate the development of scientific literacy.

Keyword: Conversation-based assessment, Inquiry, Scientific literacy, Virtual experiment, Buoyant force

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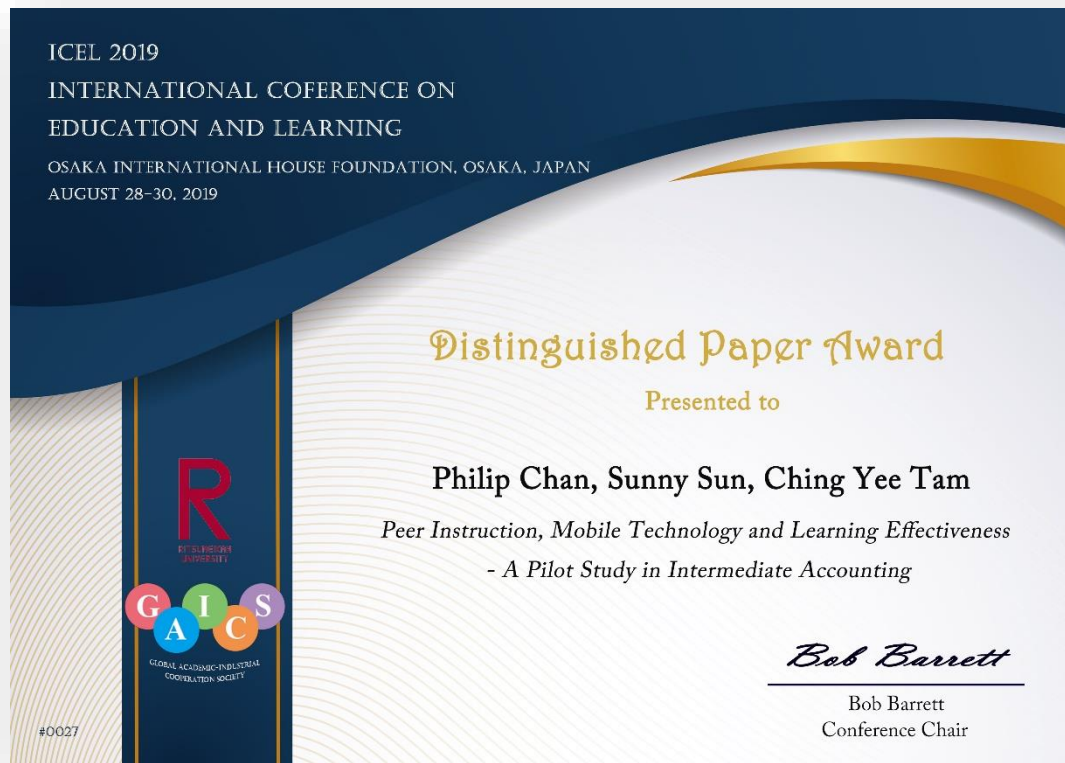
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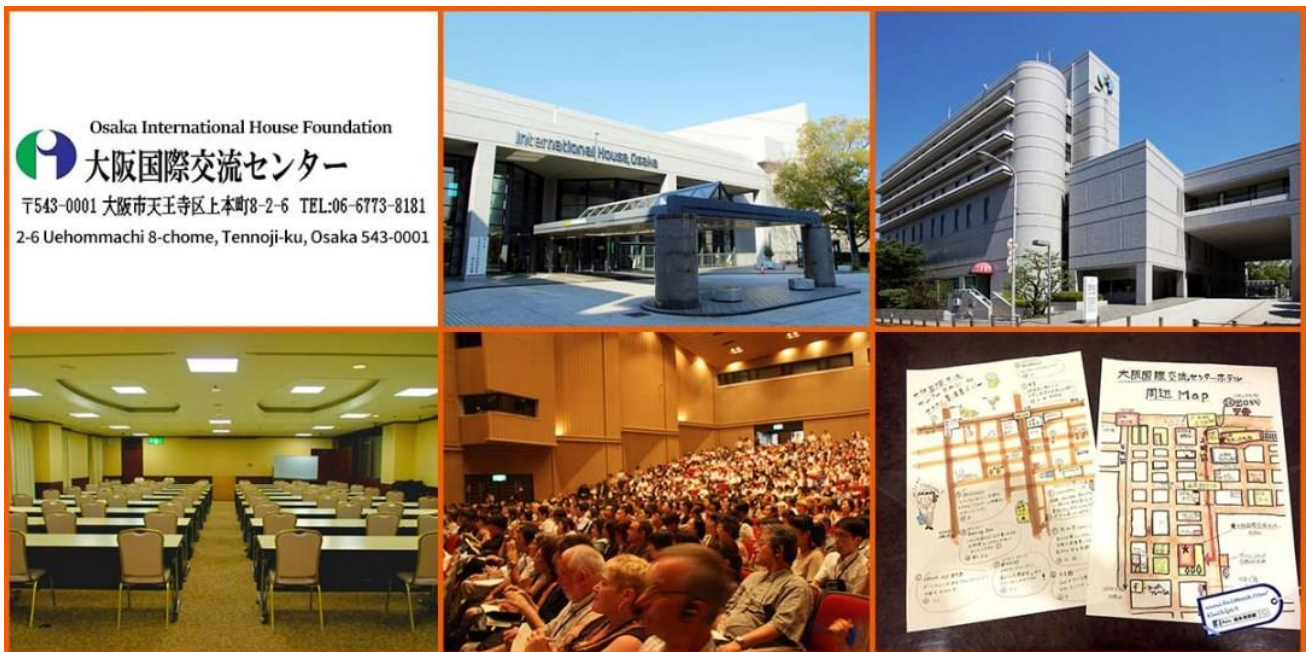
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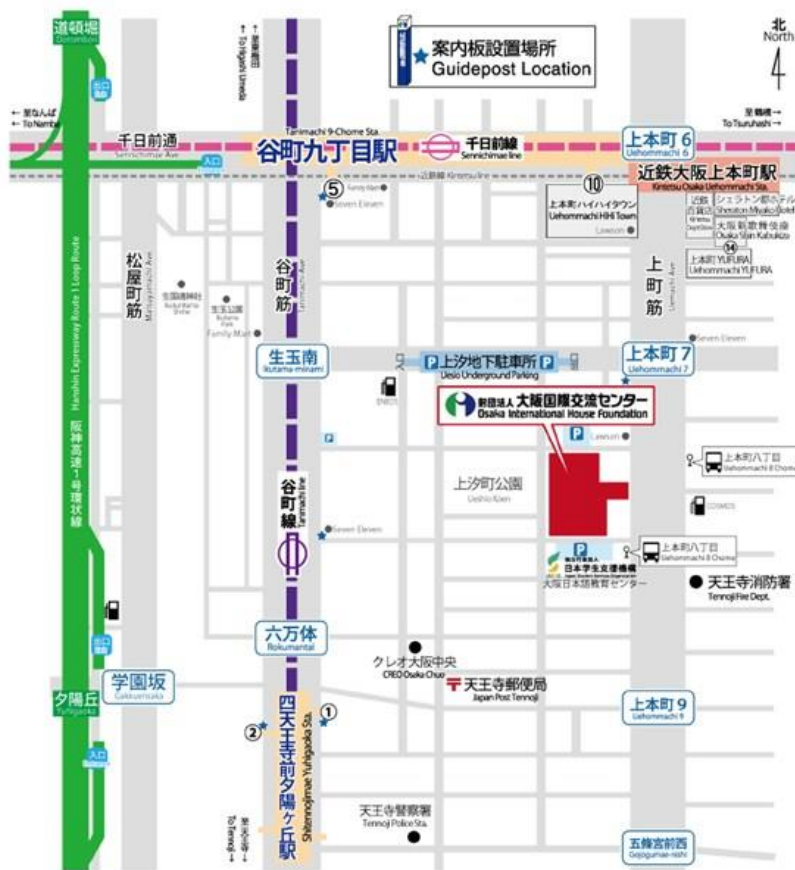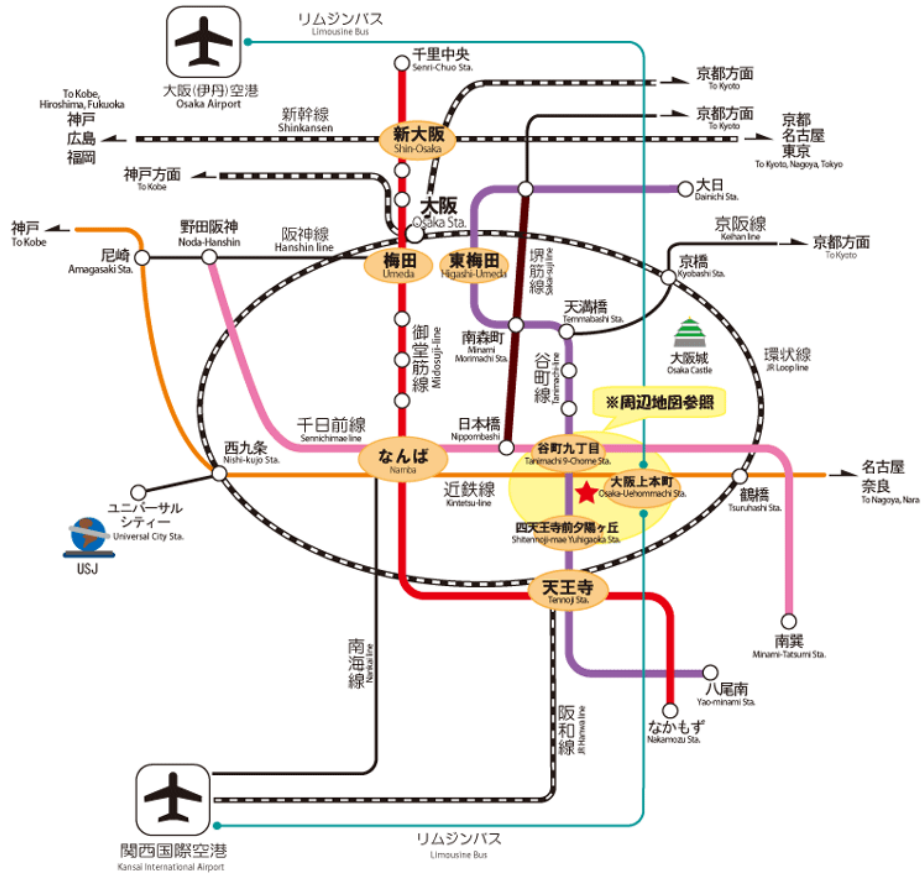
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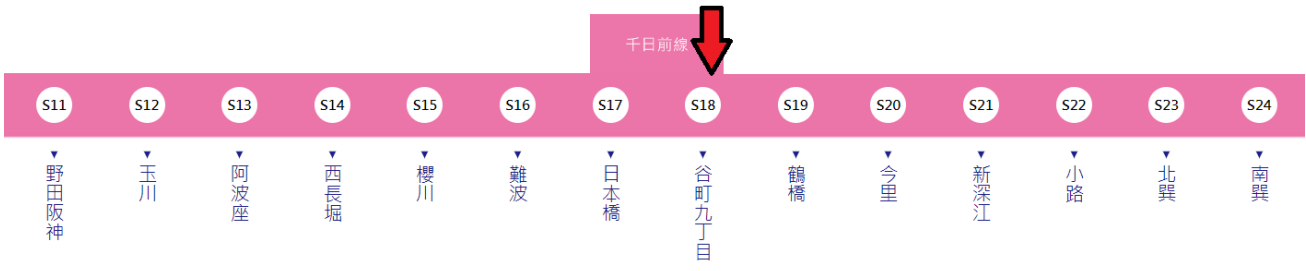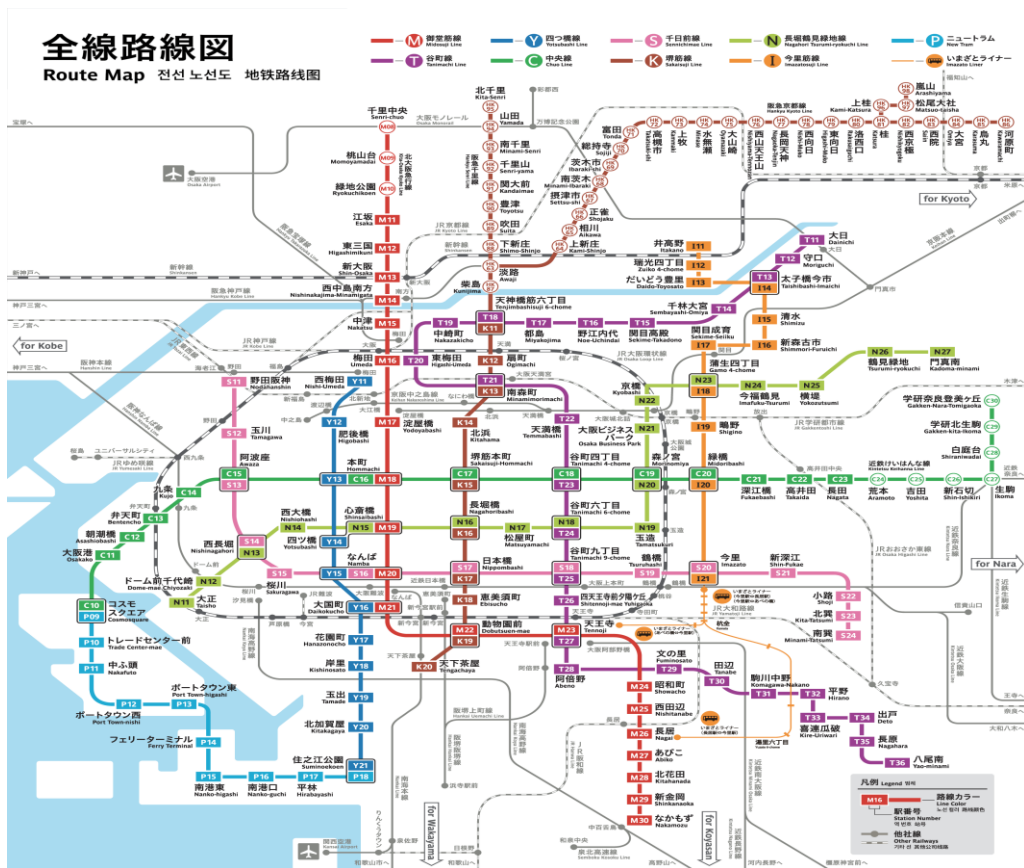10minutes walk.
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