Day 1 Breakout Session III (2.10pm - 2.50pm)

Venue: SR 6.05

[84] Choose-Your-Own-Titration-Adventure: Online Interactive Learning to Enhance Students' Laboratory Competencies

Author/s: Jayden Ang, Boon See Chericca Leong, Mei Zhen Loh and Qiao En Yim

Abstract: Videos are a common alternative to in-person laboratory experiments. However, most of these videos are not interactive and make learners passive observers. Scenario-based learning using the choose-your-own-adventure approach can better engage learners in remote learning and allow them to develop the necessary decision-making skills required in in-person laboratory lessons. Decisions related to apparatus selection, sample preparation, measurement techniques, and safety considerations significantly impact the outcome of experiments. Decision-making skills are vital for students engaging in chemistry laboratory experiments. Engaging in decision-making processes helps students develop a comprehensive understanding of experimental variables, their interdependencies, and the underlying scientific principles. Moreover, it encourages students to critically evaluate the relevance and reliability of different approaches, fostering a scientific mindset characterized by skepticism and intellectual curiosity. In this choose-your-own-titration-adventure (CYOTA) activity, students can influence the outcome of pre-recorded experiments by selecting which path to take through a set of videos. A quasi-experiment study was conducted with first-year Nanyang Polytechnic students (experimental group N=360, control group N=89) to determine the effectiveness of the CYOTA activity. Students' practical test results showed that the experimental group was more competent with their laboratory techniques. Student perception of the CYOTA activity was also obtained through a survey instrument. Students' feedback was generally positive and felt that the CYOTA activity was useful in helping them learn. Despite the positive results, it should be noted that the CYOTA activity is a good complementary activity but cannot fully substitute in-person laboratory lessons.

[158] Student Learning in a Digital Age: Advancing e-learning and space earning through staff-student co-creation

Author/s: Rodney Wai Chi Chu, Charles Wing Hung Woo and Kai Pan Mark

Abstract: In the realm of tertiary education, Learning and Teaching (L&T) is a dynamic process that requires educators to align with institutional strategic goals while also considering the digital habits of students. This paper presents an innovative pedagogical trial, the e-learning and space-earning (ESE) Approach, which has been implemented in frontline teaching. The approach emphasizes the crucial role of digital platforms like PADLET and CANVA in reshaping students' learning experiences, offering unprecedented flexibility and accessibility.

The ESE Approach utilises PADLET, a tool that enables students to actively co-create, curate, and communicate their understanding. This is complemented by CANVA, which facilitates visually engaging digital storytelling. Together, these tools foster a peer-referencing and transparent assessment model. The approach also incorporates the concept of Round Table Discussion (RTD), anchoring these tools within a framework of continuous reflection and growth.

The synergy of these elements not only transforms students from passive recipients of knowledge into active stakeholders in their education, but also enables them to take ownership of their own learning. They evolve into co-designers of their educational narratives, making meaningful contributions to the learning environment. This shift in roles is facilitated by the innovative use of

digital tools, which do more than just enhance the learning experience - they make it more engaging, immersive, and importantly, empowering for the students.

This paper provides evidence of the transformative potential of such integrative approaches in the context of student learning. It highlights the promise they hold for a more engaging, immersive, and reflective educational experience in the digital age. The ESE Approach represents a significant step forward in the evolution of L&T, one that acknowledges the changing landscape of education in the digital era and responds with innovative solutions that meet the needs of both educators and students. It's a testament to the power of collaboration, creativity, and technology in shaping the future of education.

Day 1 Breakout Session III (2.10pm - 2.50pm)

Venue: SR 6.06

[133] Enhancing Design Thinking in Education through Knowledge-Building Principles: A Case Study

Author/s: Edwin Seng

Abstract: This working paper presents a case study that delves into the synergistic application of knowledge-building principles within the realm of design thinking in educational settings. It explores the proposition that the integration of these principles can effectively mitigate the common challenge of generating innovative ideas in design thinking activities. The study thoroughly reviews relevant literature to identify and scrutinize the obstacles inherent in idea generation phases and juxtaposes knowledge-building with design thinking processes. The central hypothesis is that knowledge-building — with its emphasis on collective intelligence and shared responsibility for knowledge creation — can significantly augment the iterative and collaborative nature of design thinking. Through a methodical examination of existing studies, this paper investigates the capacity of knowledge-building to enhance the efficacy of design thinking outcomes. It posits that a confluence of these methodologies can substantially empower learners to both generate and elaborate ideas with greater proficiency. Contributing to the discourse on contemporary educational strategies, this paper offers valuable insights into how knowledge-building principles can be harnessed to fortify the design thinking framework, thereby facilitating a more robust and productive ideation process. The case study aims to enrich pedagogical approaches by equipping students with advanced problem-solving and creative thinking skills through the harmonious blending of these two educational methodologies.

[143] Engaging students in developing academic integrity: Principles for scenario designs

Author/s: Peter Lau

Abstract: Engaging students in developing academic integrity: Principles for scenario designs The International Centre for Academic Integrity (ICAI) proposed five fundamental values of academic integrity, including Honesty, Trust, Fairness, Respect and Responsibility in 1999 and then added the sixth value, Courage, in 2014. This presentation reflects on the findings of two studies on engaging research postgraduate students in learning academic integrity (understanding the above-mentioned six fundamental values) in 2021 and 2022. With the application of Augmented Reality (AR) technology in a mobile app (see Wong et al., 2018), participants (postgraduate students of a university tutor training course) were challenged to make ethical decisions at critical moments in various cases, some of which were developed from real-life scenarios reported in previous studies. In the first study, flexible thematic analysis of participants' reflections indicated an interesting finding: two posteriori codes (Empathy and Mindfulness) resulted from an examination of the student reflections. Students demonstrated concerns about these personal values or abilities in developing academic integrity. Inspirations regarding empathy and mindfulness had been drawn from psychopathy studies: a lack of empathy and mindfulness in the personality (high levels of "Meanness" and "Disinhibition") would lead to a low level of mastery motivation, which in turn would contribute to a greater tendency of academic misconduct. In the second study, results showed that the scenarios which were designed to provide process feedback (e.g., identifying misconception in judging misconduct from proper behaviours) and self-regulation feedback (e.g., exploring possible consequences of different decisions) are more engaging, compared with the scenarios focusing on task feedback (e.g., clarifying rationale of the principles). Results also showed

that authenticity and relevance are two other engagement factors in scenario design. Some scenario designs will be selected to discuss. To conclude, scenario design and feedback are the keys to developing academic integrity. Besides, educators and policymakers should caution that an over-emphasis on disciplinary measures (policies and penalties) for academic misconduct prevention is not enough, as a penalty does not foster mastery motivation.

Venue: SR 6.07

[131] A glass half full or half empty? An exploratory study of career optimism and adaptability of hospitality and tourism student interns

Author/s: Catherine Cheung and Danni Wang

Abstract: Purpose: This study aims to examine the relationship between career adaptability and optimism among hospitality and tourism student interns. Gender differences in relation to career optimism and career adaptability of student interns were also examined.

Method: A sample of China-based students studying tourism and hospitality management with internship experiences attempted our online survey and a total of 230 questionnaires were collected. A regression model was developed to understand the relationship between career optimism and career adaptability among student interns.

Results: A regression model was developed to test the relationship between career optimism and career adaptability among student interns. Career optimism is found to be a significant predictor of career adaptability. In principle, optimistic people work smart, indicate better career satisfaction, and participate in activities that increase their insights (Rottinghaus et al., 2005).

A series of independent samples t-tests were conducted to test whether gender impact students' career adaptability and optimism. There is significant effect of gender on students' career adaptability. Whereas, results did not show males and females interns have significant differences in career optimism.

Our study results show differences from the existing literatures, for instance Hirschi (2009) claimed that studies in the past have shown the development of career adaptability was unaffected by gender. On the contrary, our study revealed gender od student interns was significantly related to career adaptability, with males being more adaptable than women. This result has significant contributions to the literature by offering fresh perspectives that might potentially guide career development interventions for males and females tourism and hospitality students interns. Strategies can be implemented to influence students' career attitudes and intentions to enter the industry by painting a more optimistic picture of the future and seeking to promote positive career views.

References: Hirschi, A. (2009). Career adaptability development in adolescence: Multiple predictors and effect on sense of power and life satisfaction. Journal of Vocational Behavior, 74(2), 145–155. https://doi.org/10.1016/j.jvb.2009.01.002

Rottinghaus, P. J., Day, S. X., & Borgen, F. H. (2005). The Career Futures Inventory: A measure of career-related adaptability and optimism. Journal of Career Assessment, 13, 3–24.

[151] Redefining Engineering Education in the Era of Uncertainty

Author/s: Charles Leung

Abstract: The paper presents an effort to further refine recent approaches to engineering education reform for real-world impact. It aims to propose a heuristic framework based on the theory of boundary critique in systems thinking. This framework is intended to interpret, synthesize, and inspire the teaching and learning process in postgraduate engineering education. In addition to examining similar initiatives worldwide, the study specifically investigates the Hong Kong University of Science and Technology (Guangzhou) as a case study in the Asian context. The research team

employed participant observation, individual and group interviews, and document analysis for data collection. By analyzing the collected data, the team developed the proposed framework for sensemaking the current state of achievement and providing guidance for sustainable development. The study's results highlight several key findings. Firstly, traditional engineering education methods were found to be insufficient in preparing students for the uncertainties they will face in their future careers. The study also revealed the need for students to develop a wider range of knowledge and skills, including career adaptability, design and systems thinking, project management, and interdisciplinary collaboration. Additionally, it is important for incorporating real-world experiences and industry partnerships into the curriculum through a service-learning approach. A strategic use of on-site and online arrangements should also be necessary for supporting the development of students' ability knowledge and problem-solving capacity. Based on these findings, the paper draws important conclusions and offers recommendations for redefining engineering education. It emphasizes the need for a holistic approach that goes beyond technical knowledge to address the complex challenges of the postmodern world. The authors propose integrating cross-disciplinary courses, industry collaborations, and experiential learning opportunities to develop well-rounded engineering graduates with cultural sensitivity. They also stress the importance of fostering a shared belief in lifelong learning and career adaptability within the community of practice. The belief should be a foundation to prepare students for handling the uncertainties they will encounter throughout their careers. Therefore, the teaching team working for this innovative approach should have a trans-disciplinary background. Another implication is that it should be unnecessary for students studying this type of engineering program to have a strong science and technology training background in advance. Nonetheless, this innovative proposal should be challenging for all stakeholders; they need to keep negotiate and mediate with one another throughout the process for development.

Day 1 Breakout Session III (2.10pm - 2.50pm)

Venue: SR 6.08

[110] Development and Application of XR Distance Learning through Live Broadcasting for Collaborative Learning — A Case Study in Taiwan

Author/s: Shu-Ping Chang, Yu-Hsiu Weng, Chun-Jung Ma and Kai-Ming Yang

Abstract: With the advancement of the digital era, various innovative teaching methods that integrate virtual and real elements have emerged in educational settings. Extended Reality (XR) encompasses a range of applications that combine physical and virtual environments, along with human-computer interaction devices, including Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR).

Since 2022, Taiwan has allocated funding under the guidance of the Ministry of Education to implement the "Every Classroom Online, Every Student with a Tablet" initiative in primary and secondary schools nationwide. Continuing this effort into 2023, the Ministry of Education has subsidized the establishment of 5G mobile communication network learning environments and 3D virtual live teaching environments across various counties and cities in Taiwan. Research teams have been tasked with assisting these regions in setting up XR distance learning demonstration areas, referred to as "XR Digital Learning Centers." These centers facilitate collaborative live broadcasting through XR technology. In this setup, teaching faculty act as broadcasters in XR studios to deliver content using 360-degree scenes, 3D objects, and virtual teachers (Virtual YouTubers, VTubers) in a blended instructional design. Students and teachers in various schools across the counties and cities can then receive these broadcasts on computers, tablets, or VR headsets, allowing for the integration of VR interactions and information in physical classrooms.

The research team has successfully established an XR Digital Learning Center demonstration site at Chihlee University of Technology in northern Taiwan. Workshops and one-on-one guidance sessions have been conducted to assist counties and cities in setting up 14 XR Digital Learning Centers across Taiwan. The team has also developed six levels of XR distance learning modes. Students and teachers on the receiving end (referred to as "Collection Terminals") can access live broadcasts using tablets or VR headsets. These broadcasts enable interactive VR integration or information assimilation during physical classes.

At the broadcasting end (referred to as "Broadcast Terminals"), the following levels are available: Level 1 – 360 Panoramic Viewing Mode: Broadcasters use a 360-degree panoramic camera to deliver collaborative learning content. Level 2 – 3D Live Browsing Mode: Broadcasters use integrated 360 and 3D virtual director systems, enhancing interactive viewing experiences. Level 3 – 3D Interactive Live Mode: Broadcasters use integrated 360 and 3D virtual director systems, accompanied by custom WebVR interactive materials for guided experiences. Level 4 – 3D Immersive Interactive Mode: Broadcasters use integrated 360 and 3D virtual director systems, combined with immersive VR materials from the Education Mega Market and assessment activities. Level 5 – Integration of Virtual and Real Character Interactive Mode: Broadcasters use integrated 360 and 3D virtual director systems to enable interactions between VTuber characters and real individuals. Level 6 – Integration of Virtual and Real Space Interactive Mode: Broadcasters, through course design, create an integrated virtual and real space for interactive teaching, including both physical and remote participants.

Through the execution of the 5G XR Digital Learning Center setup and guidance project commissioned by the Taiwan Ministry of Education, XR teaching offers the following benefits: 1. Enhancing imagination: Virtual imagery and sensory effects in live broadcasts allow students to

immerse themselves in virtual spaces, enhancing learning outcomes. 2. Increasing interactivity: Both broadcasters and students can interact with each other and virtual objects, generating a more authentic experience. 3. Enhancing immersion: By integrating virtual environments and various sensory inputs, students can experience learning through different perspectives, extending beyond traditional textbook images. 4. Enabling collaborative learning: XR teaching facilitates collaborative curriculum development and resource sharing among teachers and students, reducing urban-rural educational disparities and addressing shortages of specialized teachers. This promotes the widespread application of 5G and XR technologies in education.

In addition to guiding counties and cities in the ongoing incorporation of different levels of instructional applications, the research team has also developed teaching materials and implemented courses in rural primary schools. This paper presents an overview of Taiwan's comprehensive promotion strategies and plans, followed by the design, implementation, and outcomes of the "Aviation English XR Distance Learning Demonstration Course." This includes curriculum planning, lesson design details, teaching material development approaches, execution of XR live broadcasting at the broadcasting terminal, student and teacher engagement at the collection terminal, and questionnaire and assessment results. The paper concludes with discussions on strategies for promotion, curriculum design, technological integration, and organizational support.

[121] The Future Health Professional Education: Virtual Technologies in Multiplayer Gamification

Author/s: Mei Kuen Florence Tang, Lik Hang Taylor Tang, Chiu Yung Billy Fu, Chung Hin Kenneth Lai, Charis Yuk Man Li, Miu Yung Olivia Ngan and Sin Nga Ann Lau

Abstract: Background and Aim The core knowledge, including anatomy and physiology, is crucial for fundamental health professional training. Students are required time to memorise and understand the structural relationship and theoretical concept of how body systems work. Digital technology mediates and integrates with teaching and learning in modernised tertiary education, seeking enhanced efficiency and effectiveness. Virtual Reality technology lets learners immerse themselves in three-dimensional elements of virtual world space. Multiplayer gamification is a new concept to bring a group of players into a digital game-like competition for active learning.

Our team is currently developing an innovative, dynamic approach deliverable with a metaverse concept – a real-time 3D interactive Gamified Platform (Re3D IG) for enhancement and perceived motivational support of anatomy and physiology education with the adaption of virtual and augmented realities technologies. The project aims to serve the urgent need to investigate and explore how the integration of virtual technologies as blended elearning tools for a long-term impact on future tertiary education in curricula. The deliverables of the Digestive AR (Augmented Reality) Champion, AR Brian Puzzle Challenger and VR Respiratory are set up for 3D interactive experiences in a gamified competition to promote the study of the digestive system. Our team has investigated the learning outcome from the students' perceptions if the design fits their cognitive learning perspectives.

Methods and Results Under the approval of ethics by the CUHK, the classes of year 1 Chinese medicine, year 1 biomedical sciences and year 2 pharmacy students taking the Anatomy course were recruited. In the study, all the students studied the structures of the systems for the first 60 minutes, examining the plastinated specimens respectively. They were then divided into groups to play the multiplayer gamified competition of deliverables in Re3D IG for each practical session. From the leaderboard in deliverables, the three top-ranking score students were awarded book coupons at the end of the competition. The data collection was from questionnaires using a 7-point Likert scale distributed to all participants. From the data analysis, the year one Chinese medicine students were appraised at about the mean of 5.7 in the 7-point Likert scale analysis for the innovative

setting, which can be their preference in gaining cognitive knowledge. The health professional students can understand and apply their knowledge from the effective gamification designed by Re3D IG.

Discussion and Conclusion Re3D IG in the multiplayer setting is one of the most popular active learning strategies to leverage didactic passive delivery knowledge in the classroom as a potential anatomy learning tool in professional development competence. According to Bloom's Taxonomy, the setting fulfil the cognitive, affective and psychomotor learning domains and provides learners with an entertaining, stimulating and motivating platform. Our team will further explore if there is an urge in the paradigm shift of blended learning using virtual technologies, which can make them more proficient in customising their self-learning styles for teamwork collaboration, knowledge retention and professional development competency beyond the classroom.

Day 1 Breakout Session III – Award Nominee Presentations (2.10pm - 2.50pm)

Venue: SR 6.12

Exemplary Teaching and Learning Award

Author/s: Wong Yau Hsiung

Abstract: My project, "Innovative, Interactive and Immersive Experiences in Active Blended Learning Eduverse (3I- ABLE)" stands as a beacon of innovative teaching and learning in higher education. It's a fusion of immersive learning, interactive engagement, gamification, Virtual Reality (VR), and Artificial Intelligence (AI). By harnessing these pedagogically driven technologies, transformative learning environments have been created to engage students on unprecedented levels. Students are empowered to explore complex concepts through real-world simulations, interactive gamified challenges, and AI-driven personalized guidance. This project sets a new standard for effective integration of technology, making learning not only informative but also deeply engaging and empowering.

Exemplary Teaching and Learning Award

Author/s: Fun Man Fung

Abstract: This initiative integrates Garrison's Community of Inquiry framework and game-based learning to enhance social presence and engagement in organic chemistry education. Through the online multiplayer game Chemistry Point of View.

Day 1 Breakout Session III – Award Nominee Presentations (2.10pm - 2.50pm)

Venue: SR 6.13

Exemplary Teaching and Learning Award

Author/s: Wee Yee Shara

Abstract: We utilized a Hybrid Immersive Virtual Environment (HiVE), a sophisticated six-sided CAVE, to facilitate realistic clinical simulation training for allied health and medical students at our university. This advanced platform was also utilized to prepare paediatric cancer patients and their carers for radiation therapy, providing them with realistic insights into the procedure. Supported by academic mentors and student volunteers, this initiative not only serves as a preparative tool for patients but also as a rich experiential learning opportunity for students, fostering enhanced understanding and empathy towards the unique challenges faced by paediatric cancer patients undergoing radiation therapy.

Exemplary Teaching and Learning Award

Author/s: Kim Hung Joe Lam

Abstract: We apply technology with pedagogies to enhance learning, utilizing virtual environments to facilitate STEM learning activities. We target to improve engagement and develop critical thinking, active learning, teamwork, peer-learning, and problem-solving skills of students. Educational technology and Generative Artificial Intelligence (AI)-assisted virtual tutorials will be used to improve students' active learn-to-learn behavior and higher-order thinking skills. We will also analyze learning analytics data via LMS and virtual tutorial materials to refine our teaching approach. The projects also aim to relieve concerns about the impact of AI on the integrity of students' learning by observing and nourishing their higher-order thinking skills.