Online learning and blended learning: new practices derived from the pandemic-driven disruption

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Over the past decade, enabled by educational and technological innovations, teaching and learning in higher education has been undergoing many changes, not only on instructional design and delivery but also on student advising and assessment. Many promising practices have evolved to integrate the traditional learning with innovative means in order to create a new learning environment to maximize learning flexibility, enhance learning effectiveness and enrich learning experience. Blended learning, online learning and personalized learning are exemplars of these integrations.

The last couple of years since the outbreak of COVID-19 pandemic, higher education institutions have been practicing blended learning, online learning and other modes of technology-mediated learning in order to sustain teaching and learning under stringent social distancing requirements so imposed. Whereas lectures and tutorials have to be conducted online as far as possible, face-to-face sessions are still necessary, such as practicum sessions and laboratory classes. For those institutions without much experience of deploying such non-traditional modes of learning, the sudden conversion of the classroom-based sessions to online sessions has posed a lot of challenges. At least, the teaching plan and curriculum as well as the instructional means and assessment methods need to be adjusted to accommodate a blended mode or a totally online mode of learning. Both teachers and students may not be readily adapted to and engaged in the new teaching and learning environment.

Inevitably, the pandemic impacted higher education institutions all over the world. According to the International Association of Universities, UNESCO, in April 2020,

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50% of higher education institutions stopped all campus activities, 30% partially opened but with major disruption, and 10% opened as usual with containment measures, where 1.5 billion or 89% of students were affected (Marinoni, 2020). However, the pandemic-driven disruption accelerated the move towards online teaching and learning, causing a rapid pedagogical shift from traditional class to online class sessions, personal to virtual instruction, and seminars to webinars (Mishra, et al., 2020; Mhlanga, et al., 2022). Students' learning styles and behaviours were changed, such as on learning strategy and study planning (Gonzalez, et al., 2020), learning engagement (El-Sayad, et al., 2021), learning motivation (Jereb, et al., 2022), learning anxiety (Arribathi et al., 2021), and use of open online resources (Cheung, 2021).

Without doubt, teaching and learning has undergone different levels of transformation to cope with the present unusual circumstance, as so-called new normal. Enabled by educational and technological innovations, new practices of online learning and blended learning were derived. It is time for both educational researchers and practitioners to re-visit the practices to prepare for the challenges ahead. This special issue aims to report the latest research findings with promising results on how educational and technological innovations could effectively be applied to accommodate teaching and learning under stringent social distancing requirements imposed by the pandemic. All these findings would contribute to derive new practices that can be readily deployed to cope with similar circumstances in future. There are nine papers in this special issue, briefly summarized as follows.

The first paper by Simonova, et al. investigated the main didactic features of online distance instruction. Hypotheses were set to evaluate students' opinions on the teachers' support for learners, types of study materials exploited, means used for practicing and fixing new knowledge, assessment of performance, and feedback on online distance instruction. For this study, two courses delivering online distance instruction were selected. One received positive evaluation that was appreciated, liked, enjoyed and considered efficient by the students, whilst the other one received negative evaluation that caused students discomfort in their learning. The results showed significant differences in the frequency of occurrence of observed features between the courses. It was found that teacher training was necessary under any conditions, and the preparation to use exploit technology for educational purposes was critical. Recommendations were made for successful online distance instruction.

Hew, et al. conducted two studies to explore the use of chatbots to support students in online learning activities. The first study focused on goal setting, where the participants were asked to complete a goal setting activity prior to attending class. They were engaged by a chatbot with questions developed from the SMART (specific, measurable, achievable, realistic and timely) goal-setting framework. The second study focused on social presence, where the participants were tasked to complete listening practices, where a chatbot designed from the social presence framework (interpersonal, open, and cohesive communication) was used to guide them through the listening exercises. Evaluations were conducted on the participants' behavioural engagement, perceived usefulness and ease of use of the chatbots. The findings showed positive learning experiences with both chatbots, and based on the findings, some suggestions were provided for instructors to apply chatbots in teaching and learning.

Interaction between teachers and students is critical for online lines, not only on teaching quality but also on learning effectiveness. The next paper by Xie, et al. investigated the teacher-student interaction in the online learning spaces. A design model was developed by analysing the principles underlying the interaction between teachers and students in the online learning spaces, which covers four elements, namely, subjects, behaviours, tools, and environment. Different interaction forms were identified, and various features supported by the online learning spaces were considered. The model was further refined and validated after three round of teaching practices, where a real-time dynamic AI system was used to analyse the teacher-student interaction. Evaluation was conducted, showing that the model could significantly foster students' engagement during the interaction, and that students' examination scores and problem-solving ability were significantly improved after the intervention.

Gomez, et al. presented a case study in scaling faculty development for emergency remote teaching owing to the COVID-19 pandemic. It aimed to examine the adaptation of an existing online, asynchronous faculty development resource at a university in the United States in support of the unanticipated need for instructors to practise remote teaching. A course, which was used to support instructors for transition to distance education, was adapted to address the institutional and instructors' needs as a result of the pandemic. Based on the reflective journal, analysis was conducted to provide some insights into the participants' learning experience. The results showed a positive response from the participants in terms of the efficacy of the course in guiding them to achieve the course's learning objectives, even after scaling the course to accommodate a large number of instructors for remote teaching in a short amount of time while maintaining the integrity of learning outcome.

Han and Ellis studied the relations between students' perceptions of the blended learning environment, observed online learning strategies, and academic learning outcomes, based on an introductory course on computer systems. Four types of online learning services were identified, namely, intensive theory application, moderate theory application, weak theory application and moderate theoretical testing, and weak reading and weak theory application. It was revealed that students adopted intensive theory application strategy achieved the highest academic results whilst those adopted weak reading and weak theory application strategy achieved the lowest. Amongst students who adopted the intensive theory application strategy, the proportion of students reporting better perceptions was significant higher than those reporting poor perceptions. This contrasted to the situation on students who adopted the weak reading and weak theory application strategy, where the proportion of students reporting poor perceptions was significantly higher than those reporting better perceptions.

The next two papers continue the study on blended learning in higher education. Owing to the COVID-19 pandemic, blended learning has been adopted in higher education institutions in a short span of time, and thus, many students are beginners in blended learning. Yang, et al. explored the key factors that impact these beginners' continuance intention in blended learning, based on a survey of first-year students at a university in China who experienced blended learning for the first time. It was revealed that performance expectancy, intrinsic motivation and satisfaction significantly impacted beginners' continuance intention in blended learning, and that per-

formance expectancy, intrinsic motivation and confirmation significantly impacted beginners' continuance intention through mediating variable satisfaction. Besides, academic self-efficacy would not directly impact students' continuance intention but indirectly impact students' continuance intention through intrinsic motivation.

As a form of blended learning, flipped classroom requires students to complete online pre-lecture individual learning tasks in preparation for in-lecture peer learning activities, where a known critical issue is the students' lack of motivation to complete the assigned pre-lecture tasks. Jong conducted a mixed-methods study to tackle the issue, which grounded in the instructional motivation theory of ARCS, i.e., attention, relevance, confidence and satisfaction, using spherical video-based immersive virtual reality (SV-IVR). Evaluation was conducted on the motivational affordances of SV-IVR by pre-service teachers with majors in language education, social and humanities educations, and mathematics and science education, who were generally knowledgeable about the pedagogical concept of flipped classroom. The results showed that the participants across the majors perceived SV-IVR as having desirable benefits on attention, relevance and satisfaction, but not on confidence.

Also on the use of technology, Zou, et al. investigated how technology could enhance peer, teacher and self-feedback on students' collaborative writing, critical thinking tendency and engagement in learning. An experiment was conducted to 90 postgraduate students at a university in Hong Kong, divided into three groups – one with technology-enhanced peer feedback, another one with technology-enhanced teacher feedback, and the last one with technology-enhanced self feedback. According to the evaluation results, peer and teacher feedback were significantly more effective than self feedback in assisting collaborative learning. Peer and self feedback were significantly more effective than teacher feedback in promoting critical thinking tendency. Teacher feedback was significantly more effective than self feedback in enhancing cognitive engagement in learning. The results also showed that most students enjoyed technology-enhanced feedback-assisted collaborative writing experience.

While the practices of online learning and blended learning continue to evolve, personalized learning is another area of interests receiving more and more attention from researchers and practitioners in the field. The last paper by Li and Wong reported a comprehensive review of literature on personalized learning in STE(A)M education which covers Science, Technology, Engineering and Mathematics as well as Arts. The review discovered the widespread studies in this area across various countries or territories, levels of education, subject disciplines, and learning mode. The most common objective of personalized learning lied in catering for learning styles. The issue most frequently addressed focused on evaluating the effectiveness of technologies for personalized learning. Blended learning and learning analytics were found as the most popular means to achieve personalized learning. More research on interdisciplinary and integrative approaches for STE(A)M education was suggested.

At the time of writing this editorial which is precisely 3 years after the pandemic outbreak, we notice the continuous evolution of new practices of online learning and blended learning directly or indirectly derived from the pandemic-driven disruption. This collection of papers reports these latest practices which are hoped to be of useful reference for researchers and practitioners in the field.

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