

Guest Editorial Preface

Special Issue on Impacts of Digital Learning Strategies and Applications

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Technology-based learning is increasingly important in the 21st century. In the decades, it was found that more and more teaching and learning activities could be enhanced and facilitated by the appropriate use of educational technologies (Hwang & Tsai, 2011). The popularity and advancement of computer, multimedia and communication technologies have further encouraged researchers and educators to develop new learning theories, strategies and systems. In addition, numerous studies in this area have conducted to explore various relevant issues, develop new technology-enhanced learning environments, or design effective web-based learning strategies (Hsu, Ho, Tsai et al., 2012; Yin et al., 2013).

Owing to the increasing demands of knowing how to effectively develop and apply new digital learning strategies to educational settings, it is important to create a forum for sharing the latest developments in digital learning technologies and strategies as well as demonstrating how to use those novel technologies and strategies to improve students' learning performances. The purpose of this special issue is to invite researchers who engage in the studies of using technologies in providing better learning supports and learning environments to share and exchange research experiences and findings.

One of the popular educational technologies is the Instant Response Systems (IRS) that serve as a voting or competitive quiz mechanism in the class (Hsu, 2017; Hung, 2017; Liou, Bhagat, & Chang, 2016). In addition to voting or quiz, the IRS can also be used to support peer-assessment activities (Hsia, Huang, & Hwang, 2016; Wang, Hwang, Liang, & Wang, 2017). In this special issue, in the paper entitled "A proposed cohesive use of online discussion board from the aspects of instructional and social interactions in engineering education," the authors reported a successful experience of applying online discussion board to promote peer interactions and improve students' learning performances. In another paper entitled "Peer interactions, extending pedagogical deliberations into the virtual hallway," the authors addressed the positive impacts of using asynchronous communication on peer interactions and online deliberation.

Concept mapping is another popular learning tool for helping students organize what they have learned (Wang, Huang, & Hwang, 2016). In this special issue, a paper entitled "E-Assessment system for open and short answer" is included. In this interesting study, the researchers aimed to develop an assessment system with open and short answers for guiding students to learn Arabic language; moreover, concept maps were used to represent the structure of simple Arabic sentences for helping students learn the construction of Arabic language.

In addition to promoting peer interactions and helping students organize learning contents, computer-assisted collaborative learning is also a highly recognized approach (Yin, Yau, Hwang, & Ogata, 2017; Zheng, Huang, Hwang & Yang, 2015). For example, it is difficult for instructors to conduct flexible grouping in conventional classes; however, with the help of computer technologies, it is possible and effective to employ various grouping criteria in collaborative learning activities (Wong, Hsu, Sun, & Boticki, 2013). Researchers also indicated that it is important to group students based on their personal characteristics or features, such as students' learning styles, cognitive styles, or knowledge levels (Kuo, Chu, & Huang, 2015). By taking into account the different features and objectives of the application domains, researchers could conduct collaborative learning activities with either the heterogeneous grouping approach (Chang & Hsu, 2011) or homogeneous grouping approach (Hsu, Hwang, & Chang, 2013). In this special issue, the paper entitled "Deepening the understanding of students' study-related media usage" belongs to this category. The authors successfully applied the heterogeneous grouping strategy for promoting individual students' learning outcomes. They analyzed the students' media usage by employing the clustering method.

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To sum up, it is expected that the studies presented in this special issue can inspire technology-enhanced learning researchers and provide school teachers with appropriate references for conducting e-learning activities in the future.