

Guest Editorial: Grand Challenges and Research Directions in e-Learning of the 21th Century

Nian-Shing Chen and Wei-Chieh Fang

National Sun Yat-sen University, Taiwan //
nschen@mis.nsysu.edu.tw // wfjohnny@staff.nsysu.edu.tw

E-learning has received much attention over the past decade. Its affordability has made educational technologies prevalently available in educational system. However, there exist some challenges. First, there has been a discrepancy between the latest development of learning technologies and the adoption of them in schools. Second, there have been questions about the effective implementation of learning technologies in the current educational system. Third, there have been barriers that slow down the integration of learning technology into school curriculum within formal educational systems.

In response to these challenges in e-Learning research, Prof. Nian-Shing Chen and Prof. Chin-Chung Tsai co-organized the World Submit Forum and Asia-Pacific Submit Forum on e-Learning research trends in September 7-8, 2011, Taipei, Taiwan. The two submits invited many internationally well-known scholars to present their ideas and research findings focusing on research trends in e-Learning. A grand panel was also conducted with all the speakers to facilitate two-way interactions and exchanges with the audiences. To share meeting results with more researchers in this field, we also invited five editors to write articles to share their visions and experiences regarding their concerned issues from five major international peer-reviewed journals in the field of e-Learning as follows:

- Dr. Chin-Chung Tsai, editor of *Computers & Education*
- Dr. Nick Rushby, editor of *British Journal of Education Technology*
- Dr. Michael Spector, editor of *Educational Technology Research & Development*
- Dr. Kinshuk, editor of *Educational Technology & Society*
- Dr. Joseph Psotka, editor of *Interactive Learning Environments*

Through the participation of many internationally well-known scholars, this special issue not only provides opportunities for international cooperation and communication in e-Learning studies, but also constitutes a further step in e-Learning research field. This special issue includes seven articles:

Kinshuk et al. manually explored the trends of the highly cited articles published in the *Journal of Educational Technology and Society* from 2003 through 2010. They investigated the research topics, international collaboration, participant levels, learning domain, research method and frequent author keywords. Since the ET&S journal not only includes empirical studies but also studies with innovative system and model design, this article may give both system designers and researchers a research overview over the past years and thoughts for future research.

Spector gives insights into the emerging technologies and research directions by analyzing two reputable publications, “Horizon Report” and “A Roadmap for Education Technology,” along with two sources, “IEEE Technical Committee on Learning Technology’s report” and “European STELLAR project.” The author points out the barriers to progress in adopting educational technologies as well as the critical factor in improving learning and instruction with technologies. This paper may help not only the designers but also practitioners and policy makers in adopting educational technologies.

Chai et al. reviewed papers that had investigated ICT integration using technological pedagogical content knowledge (TPACK), a framework for the design of teacher education programs. They found positive results in enhancing teachers’ capacity to integrate ICT for instructional practice. Based on the papers reviewed, a revised TPACK framework was also proposed for future study.

Rushby first reports key issues in educational technology in the past and further proposed three visions of the future learning technology. In one of his visions, he suggests Geoffrey Moore’s innovation curve can be applied to explain “how rapidly these [educational] technologies will emerge and how they can be deployed in education and training.” His analysis took an approach different from the content analysis.

Lim et al. addressed two gaps, a usage gap and an outcome gap, in educational uses of technology. They first examined the gaps between technology trends and the use of technology, in terms of success of technology implementation and effective teaching, and then discussed the causes of them. They also provided suggestions to close these gaps.

Psotka suggests that education has been slow in adopting disruptive technologies such as educational games and virtual reality environments. He urges that education should not be limited to classroom but can be extended to informal settings, such as home and Internet, where disruptive technologies can be the access point for new information and knowledge other than school. Benefits of disruptive technologies are exemplified in the article.

Tsai et al. suggests that educational technologies are essential in supporting knowledge creation. They proposed a conception of design epistemology, which emphasizes the dynamic, social and creative aspects of knowing and knowledge construction, to develop students' epistemic repertoires, or ways of knowing. With the proposed idea of design epistemology, ICT can serve as an epistemic tool for instruction so learners are encouraged to evaluate perspectives, information and knowledge acquired from ICT-supported environments.