

## Guest Editorial: Authentic Edutainment with Advanced Technologies

**Rustam Shadiev<sup>1</sup>, Wu-Yuin Hwang<sup>2</sup>, Gheorghita Ghinea<sup>3</sup> and Maiga Chang<sup>4</sup>**

<sup>1</sup>Nanjing Normal University, Nanjing, Jiangsu Province, China // <sup>2</sup>National Central University, Jhongli, Taiwan  
// <sup>3</sup>Brunel University London, Uxbridge, Middlesex, United Kingdom // <sup>4</sup>Athabasca University, Edmonton,  
Canada // rustamsh@gmail.com // wyhwang@cc.ncu.edu.tw // george.ghinea@brunel.ac.uk //  
maigac@athabascau.ca

### Introduction

Advanced information and communication technologies provide great potential for creating new learning environments. The learning process becomes more authentic and educationally entertaining with the help of modern advanced technologies (Shadiev, Hwang, & Huang, 2017). For example, learners experience authentic learning situations with educationally entertaining features, both in the classroom and outside of school, when using advanced technologies. As a result, learning becomes more attractive, effective, and meaningful (Kiernan & Aizawa, 2004; Kramsch, 1993).

Several critical characteristics of an authentic environment were highlighted by Herrington and Oliver (2000) and Newmann and Wehlage (1993). First, this type of environment provides authentic contexts that reflect the way knowledge will be used in real life. That is, learning should take place in a physical environment containing a large number of resources, which preserves the complexity of a real-life setting and reflects the way the knowledge will ultimately be used. Second, it provides authentic activities. Such activities reflect the kinds of activities in which people participate in the real world; they are meaningful and relevant to students and present complex tasks that are completed over a sustained period of time rather than a series of shorter disconnected examples. Third, it creates opportunities for learners to share their learning experiences and to practice with other learners who have various levels of expertise. That is, the students share their experiences and are able to access the experiences of other learners who have various levels of expertise. As a result, the students learn about different perspectives on the topics by considering various points of view and model their skills and performance based on those of experts. Fourth, it offers an authentic learning assessment embedded within the tasks that promotes reflection. The assessment is integrated with learning activities, peer assessment is encouraged, and the learners are assessed based on their outcomes. The learners have the opportunity to compare themselves with other learners who are in various stages of accomplishment and, thus, have the opportunity to improve their own performance and skills.

These characteristics of an authentic environment can be supported by advanced learning technologies (Shadiev, Hwang, & Liu, 2018). Scholars have argued that advanced learning technologies provide a wide range of educational affordances, including the following: pedagogical avails (in situ contextual information, recording, simulation, communication, first-person view, in situ guidance, feedback, distribution and gamification), benefits to educational quality (engagement, efficiency, and presence), and various logistical advantages (hands-free access and free up space) (Bower & Sturman, 2015; Sawaya, 2015). With the aid of advanced learning technologies, authentic edutainment learning environments have been successfully created and used in different fields of knowledge, such as language learning (Huang & Huang, 2015; Lin & Lan, 2015; Liu & Chen, 2015; Shadiev, Huang, Hwang, & Liu, 2018), science education (Looi et al., 2011; Varma, 2014), and mathematics (Carr, 2012; Ross, Morrison, & Lowther, 2010). For example, using mobile technology (e.g., smartphones), students learned basic concepts in the classroom and then applied the newly learned knowledge by solving real-life problems outside of the classroom (Agbatogun, 2014; Lin & Yu, 2016; Lin & Lan, 2015; Liu & Chen, 2015). Current mobile technologies are portable and feature multiple functions (Hwang, Ma, Shadiev, Shih, & Chen, 2016). Such characteristics are useful in supporting the learning process by incorporating many resources from the digital and physical worlds, such as creating multimedia content in an authentic environment, sharing it with classmates and the teacher, studying the content of peers' work and providing feedback on specific content (Ahn & Lee, 2015; Huang, Yang, Chiang, & Su, 2016; Huang & Huang, 2015; Huang, Shadiev, Sun, Hwang, & Liu, 2017). Furthermore, the learning process can become a healthier and happier experience with the support of wearable devices, such as clothing and accessories that incorporate computers and advanced electronic technologies, e.g., optical head-mounted displays or smartwatches (Bower & Sturman, 2015; Sawaya, 2015). That is, learners are able to not only participate in the learning process but, at the same time, monitor their physical health. Learners are able to make various adjustments throughout learning, such as by becoming more physically active, to achieve a healthier and happier learning experience.

Although many studies have considered the application of advanced learning technologies for learning and instruction, there is not much research that focuses on learning and instruction in authentic edutainment

environments, where all of the involved components of the environment (the learning environment, the advanced learning system, and/or the adaptive system) support the learning process. Taking this into account, there is a need to propose new approaches, techniques, methods, and processes in the field of authentic edutainment, with the purpose of considering the cognitive and affective aspects of the teaching-learning and decision-making processes.

This special issue aims to present innovative theoretical work and original applications in the field of authentic edutainment. This special issue focuses on original scientific contributions in the form of theoretical and experimental research and case studies that apply new perspectives or theories on the learning processes involved in authentic edutainment. This special issue also includes research on novel technologies that support authentic edutainment.

After a rigorous review process, twelve research papers were selected for inclusion in this special issue. These papers address original scientific contributions in the form of theoretical and experimental research and case studies that apply new perspectives on authentic edutainment.

The first paper, titled *Development of a SoLoMo game-based application for supporting local cultural learning in Taiwan*, was written by Yen-Ting Lin, Yu-Ming Tseng, Yi-Sheng Lee, Tz-Chi Wang, Shu-I Tsai, and Yun-Jhih Yi. In this paper, the authors aimed to promote students' local cultural learning. To accomplish this goal, the authors developed a game-based local cultural learning application based on the social, local, and mobile (SoLoMo) principle. The authors investigated the effect of implementing the SoLoMo game-based application on the students' learning performance in regards to the local culture.

The second paper, *User-Oriented EFL Speaking through Application and Exercise: Instant Speech Translation and Shadowing in Authentic Context* by Thi-Huyen Nguyen, Wu-Yuin Hwang, Xuan-Lam Pham, and Zhao-Heng Ma, reports on a study on aiding English as a foreign language (EFL) learning with a learning activity that was adapted to students' interests and the application of the ezTranslate system. The language learners attended language-learning lessons that engaged them in learning while concurrently participating in physical exercise in a real context.

Ting-Ting Wu, Yueh-Min Huang, Chen-Ying Su, Lei Chang, and Yi Chen Lu, the authors of the third paper, titled *Application and analysis of a mobile e-book system based on project-based learning in community health nursing practice courses*, introduce an e-book system that integrated project-based learning and authentic learning into a community health nursing practice course. The authors explore how the e-book features affected learning interest, motivation, performance and cognitive load.

In the fourth paper, *Enhanced Agility of E-Learning Adoption in High Schools* written by Gebremariam Mesfin, Gheorghita Ghinea, Tor-Morten Grønli, and Wu-Yuin Hwang, the authors report on a study that investigated the practice of adopting digital media (including a combination of text, images, audio and video) into the school curricula in Ethiopia. The authors surveyed the accessibility of multimedia-rich e-learning resources, the experiences of students and teachers while using multimedia technologies, and their opinions on adopting multimedia in the teaching-learning process.

The paper titled *Educational Games to Enhance Museum Visits for Schools* by Benoît Bossavit, Alfredo Pina, Isabel Sanchez-Gil, and Aitziber Urtasun focuses on enhancing a visit to the museum through a series of mini-games that shed light on various abstract concepts. The authors selected representative sculptures, designed the corresponding activities, and tested their approach on pupils from primary and secondary schools and students from an educational practice.

*Using Exaggerated Feedback in a Virtual Reality Environment to Enhance Behavior Intention of Water-Conservation* is the sixth paper and was written by Wei-Che Hsu, Ching-Mei Tseng, and Shih-Chung Kang. The authors utilized an immersive virtual environment technology (IVET) to expose learners to vivid information with personal relevance and immediacy in order to increase their behavioral intention to conserve water. The participants received exaggerated feedback (EF) that intensified the negative consequences of water consumption (direct EF) or environmental damage (ambient EF), which elicited personal affective responses to test the effects of the experimental intervention.

Yi-Lien Yeh, Yu-Ju Lan, Yen-Ting R. Lin report on a study that examined how children collaborate when creating their own stories in a 3D virtual reality (VR) environment and how their collaboration is affected by

gender in the seventh paper, entitled *Gender-related differences in collaborative learning in a 3D virtual reality environment by elementary school students*.

The eighth paper of this special issue is titled *A study of using wearable devices for healthy and happy English as a foreign language learning in authentic contexts* and was written by Rustam Shadiev, Wu-Yuin Hwang, and Tzu-Yu Liu. The authors attempted to facilitate English as a foreign language (EFL) learning with a learning activity supported by smartwatches. The activity combined EFL learning with physical exercise, such as walking around the school community. The authors tested the feasibility of facilitating EFL learning while encouraging healthy and happy lifestyle choices by examining the applicability of smartwatches in these contexts.

*Investigating Flipped Classroom and Problem-based Learning in a Programming Module for Computing Conversion Course* is the ninth paper and was written by Adriana Elena Chis, Arghir-Nicolae Moldovan, Lisa Murphy, Pramod Pathak, and Cristina Hava Muntean. The authors investigate the effectiveness of combining the flipped classroom (FC) and problem-based learning (PBL) teaching approaches in a computer programming module delivered as part of a skills conversion course. According to the authors, the combined FC-PBL approach incorporates learning technologies and supports authentic learning by providing an authentic context and multiple perspectives through teamwork and collaboration.

The tenth paper, *iAbstract: Game-driven Keyword Auction and Summarization for Academic Reading*, was written by Hercy N. H. Cheng, Calvin C. Y. Liao, and Wan-Chen Chang. In the paper, the authors report on facilitating the reading comprehension skills of graduate students by adopting the reading strategy of summarization under the scaffold of keyword evaluation. In addition, the summarization strategy was transformed into a group-based educational game by incorporating keyword auction mechanisms. The authors aimed to investigate how the summarization approach improves learners' academic reading skills.

In the eleventh paper, titled *Pedagogical Change in Mathematics Learning: Harnessing the Power of Digital Game-Based Learning*, Siew Pei Hwa focuses on the advantages of multimedia technology and the benefits of digital game-based learning. By using sample lessons from an interactive multimedia courseware called "DigiGEMs," Siew Pei Hwa emphasizes the use of digital games as a vital tool in mathematics learning. The study sets out to examine if a positive attitude towards the learning of mathematical concepts exists among young learners. It also describes the efficacy of using multimedia and game-based approaches to motivate mathematical learning in young learners.

Finally, the twelfth paper is titled *Gamifying and Mobilising Social Enquiry-based Learning in Authentic Outdoor Environments* and was written by Morris Siu-yung Jong, To Chan, Ming-tak Hue, and Vincent W. L. Tam. The paper describes the development of a mobile application, Gamified Authentic Mobile Enquiry in Society (GAMES), which supports students in conducting authentic outdoor enquiry-based learning in the area of social humanities. The authors report on a quasi-experimental study in which they evaluated the learning effectiveness of GAMES in supporting students' knowledge construction in comparison to the conventional outdoor enquiry-based learning approach.

## References

- Agbatogun, A. O. (2014). Developing learners' second language communicative competence through active learning: Clickers or communicative approach? *Educational Technology & Society*, 17(2), 257-269.
- Ahn, T. Y., & Lee, S. M. (2015). User experience of a mobile speaking application with automatic speech recognition for EFL learning. *British Journal of Educational Technology*, 47(4), 778-786. doi:10.1111/bjet.12354
- Bower, M., & Sturman, D. (2015). What are the educational affordances of wearable technologies? *Computers & Education*, 88, 343-353.
- Carr, J. M. (2012). Does math achievement happen when iPads and game-based learning are incorporated into fifth-grade mathematics instruction? *Journal of Information Technology Education*, 11, 269-286.
- Herrington, J., & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development*, 48(3), 23-48.
- Huang, C. S., Yang, S. J., Chiang, T. H., & Su, A. Y. (2016). Effects of situated mobile learning approach on learning motivation and performance of EFL students. *Journal of Educational Technology & Society*, 19(1), 263-276.

- Huang, Y. M., & Huang, Y. M. (2015). A Scaffolding strategy to develop handheld sensor-based vocabulary games for improving students' learning motivation and performance. *Educational Technology Research and Development*, 63(5), 691-708.
- Huang, Y. M., Shadiev, R., Sun, A., Hwang, W.-Y., & Liu, T. Y. (2017). A Study of the cognitive diffusion model: Facilitating students' high level cognitive processes with authentic support. *Educational Technology Research & Development*, 65(3), 505-531.
- Hwang, W.-Y., Ma, Z. H., Shadiev, R., Shih, T. K., & Chen, S. Y. (2016). Evaluating listening and speaking skills in a mobile game-based learning environment with situational contexts. *Computer Assisted Language Learning*, 29(4), 639-657.
- Kiernan, P. J., & Aizawa, K. (2004). Cell phones in task based learning-Are cell phones useful language learning tools? *ReCALL*, 16(01), 71-84.
- Kramsch, C. (1993). *Context and culture in language teaching*. Oxford, UK: Oxford University Press.
- Lin, C. C., & Yu, Y. C. (2016). Effects of presentation modes on mobile-assisted vocabulary learning and cognitive load. *Interactive Learning Environments*, 1-15. doi:10.1080/10494820.2016.1155160
- Lin, T. J., & Lan, Y. J. (2015). Language learning in virtual reality environments: Past, present, and future. *Journal of Educational Technology & Society*, 18(4), 486-497.
- Liu, P. L., & Chen, C. J. (2015). Learning English through actions: A Study of mobile-assisted language learning. *Interactive Learning Environments*, 23(2), 158-171.
- Looi, C. K., Zhang, B., Chen, W., Seow, P., Chia, G., Norris, C., & Soloway, E. (2011). 1:1 mobile inquiry learning experience for primary science students: A Study of learning effectiveness. *Journal of Computer Assisted Learning*, 27(3), 269-287.
- Newmann, F. M., & Wehlage, G. G. (1993). Five standards of authentic instruction. *Educational Leadership*, 50(7), 8-12.
- Ross, S. M., Morrison, G. R., & Lowther, D. L. (2010). Educational technology research past and present: Balancing rigor and relevance to impact school learning. *Contemporary Educational Technology*, 1(1), 17-35.
- Sawaya, S. (2015). Wearable devices in education. In *Educational Innovations and Contemporary Technologies* (pp. 36-50). London: UK: Palgrave Macmillan.
- Shadiev, R., Huang, Y. M., Hwang, W.-Y., & Liu, T. Y. (2018). Facilitating application of language skills in authentic environments with a mobile learning system. *Journal of Computer Assisted Learning*, 34(1), 42-52.
- Shadiev, R., Hwang, W.-Y., & Huang, Y. M. (2017). Review of research on mobile language learning in authentic environments. *Computer Assisted Language Learning*, 30(3-4), 284-303.
- Shadiev, R., Hwang, W.-Y., & Liu, T. Y. (2018). Investigating the effectiveness of a learning activity supported by a mobile multimedia learning system to enhance autonomous EFL learning in authentic contexts. *Educational Technology Research and Development*, 66(4), 893-912.
- Varma, K. (2014). Supporting scientific experimentation and reasoning in young elementary school students. *Journal of Science Education and Technology*, 23(3), 381-397.