

Guest Editorial: Creative Learning in Authentic Contexts with Advanced Educational Technologies

Rustam Shadie¹, Wu-Yuin Hwang^{2*} and Gheorghita Ghinea³

¹Nanjing Normal University, Nanjing, Jiangsu Province, China // ²National Central University, Jhongli, Taiwan, China // ³Brunel University London, Uxbridge, Middlesex, United Kingdom // rustamsh@gmail.com // wyhwang@cc.ncu.edu.tw // george.ghinea@brunel.ac.uk

*Corresponding author

ABSTRACT: Creativity is an important ability of an individual to meet the challenges of the 21st century. For this reason, creativity development received priority attention of scholars in the field of education. This special issue collected research articles on innovative theoretical perspectives and original applications related to creative learning in authentic contexts with advanced educational technologies. We received 36 articles and 6 of them were included in this special issue after several rounds of rigorous reviews. In this editorial note, we discuss the background for the special issue and quality management. In addition, we briefly introduce each article selected for the special issue.

Keywords: Creative learning, Authentic contexts, Advanced educational technologies

1. Introduction

Creativity is defined as the ability to produce work that is original and useful (Rhodes, 1987). Produced creative work can be both intangible such as an idea and tangible such as an essay (Sternberg & Lubart, 1999). Scholars suggest that creativity relates not only to the product that results from creative activity but also to the person who creates it, the cognitive processes involved in the creation of the product, and the environmental influences (Mayer, 1989; Rhodes, 1987). Creativity is considered as the most important 21st century skills and is a critical component of any learning program (Bryant, 2010; Lin et al., 2020; Rhodes, 1987; Shadie et al., 2017a; Sternberg & Lubart, 1999) because creative learning helps learners be innovative, learn new things, try out new ideas, and have new ways of thinking and problem-solving. For this reason, scholars conclude that creativity is important ability in today's world of innovations and creative performance needs to be facilitated in all academic levels (Lin et al., 2020; Shadie et al., 2022; Shayakhmetova et al., 2020).

Authentic learning environments play crucial role in promoting creative skills development in learners (Davies et al., 2013; Hwang et al., 2019; Jindal-Snape et al., 2013). An authentic environment here is defined as an environment that “preserves the complexity of the real-life context with rich situational affordances” (Herrington & Oliver, 2000, p. 180). Authentic learning environments contains a wide range of available resources that may stimulate learner creativity and make use of such resources supports the growth of ideas (Lin et al., 2020; Shadie et al., 2022). Furthermore, authentic learning environments give learners greater freedom for imagination, provide rich contexts for the purpose of discovering learner schemas and interests (Wu et al., 2016). Scholars suggested that authentic contexts reflect the way that the knowledge will be used by learners in their real life (Herrington & Oliver, 2000; Shadie et al., 2017b). Therefore, it is important to encourage creative learning in authentic learning environments.

Creative learning in authentic contexts can be supported by advanced educational technologies (Huang et al., 2017; Hwang et al., 2021; Shadie et al., 2017a; Shadie et al., 2015). Advanced educational technology here can be defined as a combination of the processes and tools involved in addressing educational needs and problems, with an emphasis on applying the recent and advanced tools such as computers and other electronic devices (Cifuentes et al., 2011). For example, several advanced educational technologies were listed in Brown et al. (2020), Hwang et al. (2022) and Shadie and Yang (2020) among them were social networking, artificial intelligence, virtual and augmented reality, robots and many others. Advanced educational technology has many advantages such as it can be used for simulating and restoring some special learning scenes vividly or extending classroom learning to the outdoor environment, enabling learner interaction with the instructor, peers, and learning content (Huang et al., 2017; Shadie et al., 2017b; Wang, 2020; Wu, 2014). In addition, the technology allows learners to create their own multimedia learning content, share it with their classmates and the instructor, and discuss its strong and weak points thus facilitating creative learning and learner ownership and autonomy (Ahn & Lee, 2015; Huang & Huang, 2015; Shadie et al., 2017a).

Although many studies have considered the applications of advanced educational technologies to support learning programs, there are not so many studies that focus on creativity. Therefore, there is a need to propose new ideas related to creative learning in authentic contexts with advanced educational technologies, which considers various theories, approaches, techniques, methods, and processes. The aim of this special issue is to collect innovative theoretical work and original applications related to technology-supported creative learning programs in authentic contexts. This special issue focuses on learning models and theories that explain this important dimension, their applications for creative learning in authentic contexts and evidence of their effectiveness based on systematic or empirical data. This special issue also brings research on novel technologies design and on their educational applications that bridges the innovation, pedagogy and practice in technology-supported creative learning.

For this special issue, initially we received 36 submissions from different countries and territories. After that, they were reviewed by well-known international experts in the field. Every article was reviewed by at least three reviewers. After several rounds of a rigorous review process, the best six articles that represent the highest quality suitable for such prestigious journal as *Educational Technology & Society* were selected for inclusion in the special issue. The selected articles address original scientific contributions in the form of theoretical and experimental research and case studies that apply new perspectives on creative learning in authentic contexts with advanced educational technologies.

The first article of the present special issue is *Authentic Learning, Creativity and Collaborative Digital Storytelling: Lessons from a Large-Scale Case-Study* prepared by Nicoletta Di Blas. The author explored whether PoliCultura, a collaborative digital storytelling program for K-12 schools, can foster creativity. All the “stories” submitted to the competition in 2020 were analyzed using a literature-based creativity rubric. The key factors for promoting creativity were discovered and relevant guidelines for educators and researchers were proposed by the author based on the results of the study.

In the second article titled *Open-Ended Tasks Promote Creativity in Minecraft* by Yue Fan, H. Chad Lane and Ömer Delialioğlu, the authors studied the extent to which an open-ended task influences subsequent problem-solving behaviors in a virtual environment. To this end, the authors explored creativity and its relationship with task design in Minecraft and compared a well-defined task group, instructed to follow step-by-step directions, with a group pursuing an open-ended task requiring a higher degree of agency.

The third article by Hyo-Jung Kim, Hyo-Jeong So and Ju-Yeon Park titled *Examining the Effect of Socially Engaged Art Education with Virtual Reality on Creative Problem Solving* focuses on investigating the effect of socially engaged art education with virtual reality on creative problem solving. The participants of the study took part in a four-stage socially engaged art educational program such as appreciation and interpretation of artwork about social issues, discussion on the potential solution to the selected social issue, creating a 3D virtual world to express proposed solutions, and experiencing and sharing 3D virtual worlds. Then participants creative problem-solving skills in three areas such as higher-order thinking, divergent thinking, and problem-solving were examined.

Jin Xinquan, Qiang Jiang, Xingzhu Pan and Wei Zhao in the fourth article titled *The Design and Evaluation of Self-Directed Learning Environment for Creativity Performance* designed an online self-directed learning environment (OSDLE) to improve students’ creativity performance. OSDLE helped students plan their learning, learn instructional content, and evaluate and reflect on their learning. The authors carried out the experiment to measure and compare creativity performance of students who learned in OSDLE with that of students who learned in the traditional classroom.

The fifth article is *Does Motivational Design Matter? Motivating Learners in an Augmented Astronomy App* and it was prepared by Chia-Chen Chen, Hong-Ren Chen and Ting-Yu Wang. In the article, the authors proposed creative situated learning via augmented reality (AR), and they developed an AR-based Cosmos Planet Go App to simulate the motion of planets in the universe. With such approach, the authors aimed to help their students better understand the characteristics and features of each planet through its simulated motion in the universe. A quasi-experimental design was applied to demonstrate the effectiveness of the intervention on students learning outcomes.

In the sixth article by Wei-Shan Liu and Ting-Ting Wu titled *Authentic Learning in a Second-year Elementary School Curriculum: Use of a Self-Driving Vehicle for Discussing Innovative Applications of Driverless Cars*, the authors designed authentic learning activities in which they designed authentic learning activities and introduced remote-control cars in order to improve creative thinking skills and problem-solving abilities of elementary

school students. An experiment was carried out to test the effectiveness of proposed intervention on creative thinking skills and problem-solving abilities.

References

- 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. <https://doi.org/10.1111/bjet.12354>
- Brown, M., McCormack, M., Reeves, J., Brook, D. C., Grajek, S., Alexander, B., Bali, M., Bulger, S., Dark, S., Engelbert, N., Gannon, K., Gauthier, A., Gibson, D., Gibson, R., Lundin, B., Veletsianos, G., & Webber, N. (2020). *2020 EDUCAUSE horizon report: Teaching and learning edition*. EDUCAUSE Publications. https://library.educause.edu/media/files/library/2020/3/2020_horizon_report_pdf.pdf
- Bryant, C. (2010). A 21st-century art room: The remix of creativity and technology. *Art Education*, 63(2), 43-48. <https://doi.org/10.1080/00043125.2010.11519061>
- Cifuentes, L., Maxwell, G., & Bulu, S. (2011). Technology integration through professional learning community. *Journal of Educational Computing Research*, 44(1), 59-82. <https://doi.org/10.2190/ec.44.1.d>
- Davies, D., Jindal-Snape, D., Collier, C., Digby, R., Hay, P., & Howe, A. (2013). Creative learning environments in education—A Systematic literature review. *Thinking Skills and Creativity*, 8, 80-91. <https://doi.org/10.1016/j.tsc.2012.07.004>
- Herrington, J., & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development*, 48(3), 23-48. <https://doi.org/10.1007/bf02319856>
- 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. <https://doi.org/10.1007/s11423-015-9382-9>
- 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. <https://doi.org/10.1007/s11423-016-9475-0>
- Hwang, W. Y., Hariyanti U., Chen, N. S., & Purba, S. W. D. (2021) Developing and validating an authentic contextual learning framework: Promoting healthy learning through learning by applying. *Interactive Learning Environments*. <https://doi.org/10.1080/10494820.2021.1876737>
- Hwang, W. Y., Hoang, A., & Lin, Y.-H. (2022). Smart mechanisms and their influence on geometry learning of elementary school students in authentic contexts. *Journal of Computer Assisted Learning*, 37(5), 1441– 1454. <https://doi.org/10.1111/jcal.12584>
- Hwang, W. Y., Purba, S. W. D., Liu, Y., Zhang, Y., & Chen, N. S. (2019). An investigation of the effects of measuring authentic contexts on geometry learning achievement. *IEEE Transactions on Learning Technologies*, 12(3), 291-302. <https://doi.org/10.1109/tlt.2018.2853750>
- Jindal-Snape, D., Davies, D., Collier, C., Howe, A., Digby, R., & Hay, P. (2013). The impact of creative learning environments on learners: A systematic literature review. *Improving Schools*, 16(1), 21-31. <https://doi.org/10.1177/1365480213478461>
- Lin, L., Shadiev, R., Hwang, W. Y., & Shen, S. (2020). From knowledge and skills to digital works: An application of design thinking in the information technology course. *Thinking Skills and Creativity*, 36, 100646. <https://doi.org/10.1016/j.tsc.2020.100646>
- Mayer, R. E. (1989). Cognitive views of creativity: Creative teaching for creative learning. *Contemporary Educational Psychology*, 14(3), 203-211. [https://doi.org/10.1016/0361-476x\(89\)90010-6](https://doi.org/10.1016/0361-476x(89)90010-6)
- Rhodes, M. (1987). An Analysis of creativity. In S. G. Isaksen (Ed.), *Frontiers of creativity research: Beyond the basics* (pp. 216–222). Bearly.
- Shadiev, R., Huang, Y. M., Hwang, W. Y., & Liu, T. Y. (2017a). Cognitive diffusion model: Facilitating EFL Learning in an authentic environment. *IEEE Transactions on Learning Technologies*, 10(2), 168-181. <https://doi.org/10.1109/tlt.2016.2574356>
- Shadiev, R., Hwang, W. Y., & Huang, Y. M. (2017b). Review of research on mobile language learning in authentic environments. *Computer Assisted Language Learning*, 30 (3-4), 284-303. <https://doi.org/10.1080/09588221.2017.1308383>
- Shadiev, R., Hwang, W. Y., Huang, Y. M., & Liu, T. Y. (2015). The impact of supported and annotated mobile learning on achievement and cognitive load. *Educational Technology & Society*, 18(4), 53–69. <https://www.jstor.org/stable/jeductechsoci.18.4.53>

- Shadiev, R., & Yang, M. (2020). Review of studies on technology-enhanced language learning and teaching. *Sustainability*, 12(2), 524. <https://doi.org/10.3390/su12020524>
- Shadiev, R., Wang, X., Liu, T. Y., & Yang, M. (2022). Improving students' creativity in familiar versus unfamiliar mobile-assisted language learning environments. *Interactive Learning Environments*. <https://doi.org/10.1080/10494820.2021.2023891>
- Shayakhmetova, L., Mukharlyamova, L., Zhussupova, R., & Beisembayeva, Z. (2020). Developing Collaborative Academic Writing Skills in English in CALL Classroom. *International Journal of Higher Education*, 9(8), 13-18.
- Sternberg, R. J., & Lubart, T. I. (1999). The concept of creativity: Prospects and paradigms. In R. J. Sternberg (Ed.), *Creativity research handbook* (pp. 3–15). Cambridge University Press. <https://doi.org/10.1017/cbo9780511807916.003>
- Wu, T. T., Huang, Y. M., & Shadiev, R. (2016). The Application of multi-dimensional learning portfolios for exploring the creativity learning behavior in engineering education. *Proceedings of the ASEE Annual Conference and Exposition, ASEE 2016*. <https://doi.org/10.18260/p.27355>
- Wang, Y. H. (2020). Integrating Games, e-Books and AR Techniques to Support Project-based Science Learning. *Educational Technology & Society*, 23(3), 53–67. <https://www.jstor.org/stable/26926426>