Introduction to the special issue on advances in multimedia and educational technology

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INTRODUCTION

Introduction to the special issue on advances in multimedia and educational technology

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With the advances in communication and information, multimedia and other new technologies, the paradigm of education has been shifting from the conventional paper-based instruction to technology-embedded instruction. Educational institutions around the world have been incorporating new technologies into existing curriculum and course design in order to reinforce traditional textbook-based and classroom-based instruction. These technology-mediated learning environments have helped learners interact with contents, peers, and teachers. Now, thanks to the development of digital devices such as mobile phones and smart pads, ubiquitous learning following anywhere and anytime principles has become the new educational trend.

The objective of this Special Issue is to investigate and explore the impact and outcome of integrating new technologies into the field of education and training. Articles for this Special Issue address a range of education and training settings, focusing on the theory, practice, and development of multimedia and educational technology. Particularly, there is a focus on pedagogical applications of new technologies in order to offer innovative ideas and insight in the fields of education and training.

The first paper entitled “Utilising behavioural analytics in a blended programming learning environment,” (Paredes, Huang and Hsiao) reports on a study of the investigation of students’ learning effectiveness in programming learning. To achieve this, they utilised Web Programming Grading Assistant, which was a homegrown educational web application that provided augmented grading and feedback giving interfaces for handwritten assignments. By analysing the relation between students’ effort and academic performances, they concluded several educational implications.

The second paper “Combining object detection and causality mining for efficient development of augmented reality-based on-the-job training systems in hotel management” (Koo, Lee and Kwon) proposes an AR-based On-the-job training system which employs text mining and object detection. In the system, syntactic expression of causality is learned and stored in the casual
pattern identifier. After that, causality is mined by constructing multiple sets of causal pairs. Then, real-world objects are detected, and causal pairs associated with that objects are displayed on the trainee’s AR screen. The results illustrate that the trainee group who used this system showed better performance in several learning effectiveness criteria.

The third paper entitled “Systematic review and usability evaluation of writing mobile apps for children” (Saad Missen, Javed, Asmat, Nosheen, Costaty, Salamat and Prasath) details a systematic review of mobile apps for learning writing skills. The study involves the detailed review of the range of functions, target user groups, operating language, acquisition costs, user ratings and the connection between acquisition cost and user ratings, and a participant-based usability evaluation of a sample of apps.

The fourth paper entitled “Video-based learning assistant scheme for sustainable education,” (Jung, Son, Kim, Rew and Hwang) describes a learning assistant system based on educational video platforms that enhances the learning efficiency. The system provides learners various information, such as keywords, topic tags, readability level, keyframes, and named entities, and defines three metrics for evaluating the similarity between videos. By implementing a prototype system on a website for speech videos, they show the effectiveness and feasibility.

The fifth paper entitled “A novel approach for finding research areas for new researchers” (Malik, Khan, Faisal, Mahmood, Seo, and Bhutta) proposes a method for identifying attractive research areas for new scholars. To find the attractiveness of a research area, this study introduces scoring patterns and a strategy for evaluating the work of a scientist. The results showed that proposed method worked effectively and found some unattractive popular research areas and unpopular attractive areas.

The sixth paper entitled “Design and implementation of invention learning curriculum-based serious game contents,” (Yoon and Kim) describes the design and development of a serious game in which gameplay and learning are well-balanced. They evaluated the effectiveness of the game in learning and found that their serious game was effective for elementary school students.

The final paper, “Utilizing Problem Solving: From Self-Assessment to Self Regulating” (Alzaid and Hsiao) integrates an adaptive platform “QuizIT” to personalise the sequence of the recommended assessments in the course. The purpose of the system is to provide a mechanism for the learners to optimise their progress and extend the coverage of the course dataset of questions.

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