



## Editorial: E-Assessment and Its Role and Possibility in Facilitating Future Teaching and Learning

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Along with the development of information communication technology, e-assessment technology has gradually come into maturation and been widely applied to teaching practices and educational studies. Digital assessment has the advantage of providing examinees with instant feedback, reducing teacher's work load, assisting digital learning, and developing student's ability to do self-assessment. Other advantages of this kind of assessment are reduction of paper consumption, quick collection and analyzes of data, easier manipulation with test item resources, etc.

E-assessment can be implemented in e-teaching environments as well as in conventional teaching environments. Regarding the purpose of use in educational process, this assessment method can be utilized in two ways: (a) to assess and diagnose student's learning, and (b) as teaching and learning strategies. The former one is used as a summative purpose. After the examination is completed, test items and examination paper are analyzed to reveal their quality and student's learning status. There are also adaptive assessment systems which are developed based on modern testing theory, such as cognitive diagnosis models (CDMs), to precisely diagnose student's misconceptions and their cognitive status. This kind of assessment quickly provides full and multi-dimensional feedback so as to help teachers improve teaching and students learning. For the latter, e-assessment and teaching activities are closely combined. Test items in e-assessment play the role of an instructor. Examinees learn in the process of assessment and teaching activities. In addition, since self-assessment is able to help learners monitor their own learning process and achievements and understand whether they themselves have caught the key learning points, it makes self-regulated learning easier for learners. This special issue of *Eurasia Journal of Mathematics, Science, and Technology Education* addresses issues related to the implementation of e-assessment in teaching and

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learning. It contains 7 papers presenting the research results of 15 researchers from 8 institutions in Asia and Europe.

The paper of De Marsico, Sciarrone, Sterbini, and Temperini, "*Supporting mediated peer-evaluation to grade answers to open-ended questions*," showed an approach to semi-automatic grading of students' answers to open ended questions. The authors developed and implemented a framework based on a Bayesian Network. Their experiments with this framework show its good performance in terms of grading accuracy, as well as its interesting predictive power of the student's final outcome. In their paper "*The Multiple Faces of Peer Review in Higher Education, Five Learning Scenarios developed for Digital Business*", Herzog and Katzlinger present an analysis of their experiment with different tasks and different learning scenarios using peer review. They point out the necessity of differentiation according to the target group and learning level of students. Further analysis of other criteria such as lead time, support expense, social interaction, etc. and their impact on learning performance is also provided. The paper of Lin and Wang, "*Implementation of Personalized e-Assessment for Remedial Teaching in an e-Learning Environment*," adopted a personalized Web-based dynamic assessment in an e-Learning environment. The authors proposed a technique to develop the dynamic assessment items and prompts. The personalized Web-based dynamic assessment and the item construction techniques are valuable for the strategy designs of self-assessment, self-directed learning and self-regulated learning in an e-Learning environment. The paper of Farhan and Aslam', "*An Interactive Assessment Framework for Visual Engagement: Statistical Analysis of a TEDx Video*," developed a framework for assessing the visual engagement of the video lectures. This paper introduced a new algorithm and data collection module to help teachers and students to understand the overall visual attention of the videos. The findings is valuable for the research and practice about MOOCs (Massive Open Online Courses) and SPOCs (Small Private Online Courses). The paper of Iqbal and Saleem, "*Delay Assessment Framework for Automated Question-Answering System: An Approach for eLearning Paradigm*," introduced an algorithm for the delay assessment analysis. They also developed a data analysis model for delay assessment. The findings are valuable for the research on questioning and answering of teachers and students in an e-Learning environment. The techniques are also useful for the MOOCs and SPOCs. The paper of Chou, "*An Analysis of the 3D Video and Interactive Response Approach Effects on the Science Remedial Teaching for Fourth Grade Underachieving Students*," adopted an interactive response system in a 3D video teaching environment for remedial teaching. The findings indicated that the interactive response system is an effective e-assessment technique on improving student science learning effectiveness. The paper of Chiu and Hsieh, "*Role-Playing Game Based Assessment to Fractional Concept in Second Grade Mathematics*," investigated differences in academic performance and learning attitudes between RPG-based assessment and traditional lectures as well as the satisfaction of students toward the RPG scenario. The results of an experiment showed that learning by using RPG-based assessment in elementary schools can effectively improve the performance and learning attitudes of students.

Each paper published in this special issue has been reviewed from two anonymous referees and all the manuscripts have been revised. We would like to thank the precious work of the reviewers that improved the initial manuscripts.

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