

Editorial

Special Issue “Emerging Artificial Intelligence (AI) Technologies for Learning”

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1. Introduction

The future of education lies in the ability to develop technologies which integrate seamless artificial intelligence (AI) components into the educational process, in order to deliver a personalized service which is dynamically tailored to the learner’s characteristics, abilities, and needs. This technology-driven approach is not meant to replace classic established methods entirely, but plays a major role in improving upon them, and in targeting new educational goals where special educational needs cannot be adequately addressed without a more modern approach.

In this context, the presence of AI-based technologies is significantly impacting modern educational systems. Clear examples of this phenomenon are the virtual learning environments (supporting learners’ profiling and learning analytics) used in academia, toy robots or storytelling software tools used in kindergarten and primary education, serious games for training, etc. In the modern world, which demands education to be quick, effective, and able to respond to fast-changing topics and individual learners’ needs, AI seems to be the most suitable tool to cater to these requirements. The state-of-the-art pieces of work published in this Special Issue confirm this, and further show that multiple AI approaches can be used in a variety of application domains within the education field.

A total of eleven selected articles, briefly summarized in order of appearance therein, form this Special Issue. Nebot et al. [1] employ fuzzy logic to design an e-learning toolbox to help teachers to make decisions and carry out improvement actions on their course. Villegas-Ch et al. [2] propose an improved online education model, integrating machine learning and data analysis for managing learning activities, while Szwarc et al. [3] introduce an interactive planning system for a competency-driven allocation of teachers to courses. The e-learning partner program (for elementary and secondary students) conducted by Hou et al. [4] is then thoroughly analyzed. An interesting approach to managing school attendance, suggested by Moodley et al. [5], based on a carefully designed data mining system, can suggest to headteachers how to organize activities to prevent absenteeism. To support remote learners, Fanini and Cinque [6] present an open-source framework for capturing and analyzing virtual reality sessions. D’Errico et al. [7] study the emotional reactions of learners in a virtual reality context. Sun et al. [8] adopt a generative adversarial network to enhance classification, while Qu et al. [9] use an LSTM neural network model and data mining techniques to predict student achievements. Wu et al. [10] employ recurrent neural networks for the infrared spatial point target classification problem. Finally, Do et al. [11] propose an ontology model forming the knowledge bases for intelligent problem solvers in many mathematical courses.



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2. Conclusions

Submissions for this Special Issue are now closed. Further studies and applications of AI approaches in educational and learning contexts continue to be proposed and address challenges such as the explainability and interpretability of AI model's outcomes.

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