

Editorial

Smart Education Systems Supported by ICT and AI

Boris Aberšek *  and Andrej Flogie

Faculty of Natural Science and Mathematics, University of Maribor, 2000 Maribor, Slovenia; andrej.flogie@um.si

* Correspondence: boris.abersek@um.si

Contemporary society, the society of the future (Industry 4.0 and Society 5.0), will require us to develop entirely new knowledge, skills and competencies, and consequently, new ways of teaching and learning. Our aim with this Special Issue is to bring to attention a form of teaching and learning that transcends these changes' logic and rhetorical appeal. Suppose we want to make substantial changes in the education process, whereby the introduction of ICT and intelligent learning systems are classified as such. In that case, the current education process must be led to the edge of chaos and then reformulated in cognitive modeling. Suppose we want to introduce innovation to this process. In that case, every aspect of the education process and system needs to be studied and reconsidered in light of new and different social expectations.

The text discusses seven research papers that explore the intersection of education and technology. These papers aim to address various challenges and improve different aspects of the education system. Kim et al. [1] focus on the issue of high dropout rates among university students. Dropout prediction models using machine learning have been developed to prevent students from leaving their studies. However, meeting the needs of consulting institutes and academic affairs offices has proven challenging. The authors propose a Student Dropout Prediction (SDP) system, a hybrid model aiming to increase the precision and recall rate in predicting dropouts. The model achieved a higher precision value than existing models, and it also analyzed the reasons for dropping out, providing valuable insights for counselling and personalized support. Ramírez Villegas et al. [2] explore the concept of ubiquitous learning in virtual higher education institutions. Ubiquitous learning refers to learning available at all times and in all places. The paper presents the U-Learning Model Supported by Learning Experiences and Connective Learning (U-CLX Model), which measures ubiquitous learning in four dimensions: time, place, medium, and context. The model provides a framework for assessing the level of ubiquitous learning in virtual institutions and suggests ways to improve their operations. Apoki and Crisan [3] discuss personalized adaptive learning, which combines personalized learning and adaptive learning to cater to individual needs and facilitate personal development. One of the critical limitations of existing systems is the need for reusable personalized content and logic. The paper proposes a modular framework called WASPEC for personalized adaptive learning. The framework aims to foster the creation of reusable personalized content and systems that can efficiently share information. An improved architecture, WASPEC 2.0, is also presented to enhance flexibility. Karakolis et al. [4] focus on bridging the gap between technological education and job market requirements. Technological professions evolve rapidly, and higher education institutions often need help to keep up with the changing skills requirements. The paper presents a skill and course recommender system that helps learners select courses valuable for the job market. A curriculum design service also recommends curriculum updates based on job market needs. These services are built on a text mining service that retrieves job posts and extracts relevant skills. The paper aims to facilitate optimal decisions for learners and education decision-makers, ensuring that education aligns with the job market's needs. Aljohani et al. [5] utilize AI, deep learning, and big data technologies to predict future market needs for sustainable skills in Saudi



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Arabia. Analyzing big data job posts provides insights to improve student satisfaction, retention, and employability. It identifies the skills required for job positions and helps align business and industry with academia. The study aims to support the country's digital transformation and foster innovation. Balaban and Sobodić [6] assess the implementation effectiveness of an online platform for digital competence (DC) certification in schools. The study confirms that integrating and evaluating DC acquisition, evaluation, and certification within formal curricula is possible. It emphasizes the importance of information quality in impacting end-user experience. The study provides valuable insights for schools and policymakers in implementing and assessing platforms for DC certification. Veber et al. [7] explores the implementation of a modern immersive learning model for robotics education. The paper proposes a cyber-physical didactic model (CPLM) that focuses on student problem-solving using cyber-physical systems. The study includes measurements, evaluations, and virtual reality (VR) to enhance spatial and visual memory. The findings suggest that the newer approach to teaching robotics is promising, and further investigation into modern technologies and training methods is needed.

This Special Issue collects much breakthrough research on the development and application of computational modelling use of a learning environment based on ICT and intelligent learning systems for problems especially connected to society and the learning and education system inside this society. Although submissions for this Special Issue have been closed, more in-depth research in the field of Smart Education Systems Supported by ICT and AI continues to address the challenges we face today in computational modelling, and the use of a learning environment based on intelligent learning systems.

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