

Guest Editorial – Interactive and Innovative Technologies for Smart Education

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Smart education is the key technology that facilitates a major shift from the traditional practice of face-to-face learning methodologies into distance learning paradigms. Due to its distributed nature, a broad range of disruptive technologies such as cloud computing, virtual reality, and augmented reality have been increasingly adopted to enhance the process of the smart education system. As a matter of fact, communication forms a vital part of the educational forum, which becomes extremely complex when dealing with online learning paradigms such as smart education. It has been a long way that smart education has come into existence, but it still needs to improve its interface and interactive methodologies to leverage its full potential towards society. In the present scenario, dramatic improvements in e-learning methodologies such as virtual learning and online interactive learning solve typical intractable problems and offer sophisticated learning experiences to the end-users in a more convenient way. Virtual classrooms have attracted increased attention in recent times as it provides the most reasonable educational services. It efficiently visualizes the data from hundreds of computer networks simultaneously, enabling the users to offer the most relevant and actionable response to the virtual environment using headphones. In addition, the use of advanced network technologies such as 5G makes this process take place in a much faster way, with much more data flow facilities. In summary, smart education in the digital era of computing technology is actually a cool upcoming trend, where the vast amount of individuals from the educational society may unimaginably gain benefit from this learning method. However, emphasizing the need for interactive and innovative technologies for smart education also acquire greater importance as it forms the key requirement of the present-day smart education environment.

As a result, this special section aims to explore more deep insights into interactive and innovative technologies for smart education from various perspectives of the teaching and learning methodologies. It consists of seven articles from different areas of smart education selected among more than 30 submitted papers. Each paper was reviewed by three reviewers. We are grateful for the hard work and enthusiasm of authors and reviewers, without which the current special section would not have been possible.

The first article, “Application of Wearable Motion Sensor in Business English Teaching” by Fen Guo conducts an empirical analysis on motion sensors application in business English teaching. It mainly collects speech information through wearable motion sensor,

analyzes the reading correctness of students through speech recognition, so as to promote students to learn business English better. Firstly, the wearable sensor is used to collect and preprocess the speech information of students' business English reading as the input of speech recognition. Secondly, the linear predictive cepstrum coefficient (LPCC) and Meier frequency cepstrum coefficient (MFCC) of students' business English reading speech are extracted, and the mixed parameters of LPCC and MFCC are taken as speech features. Finally, the correctness of reading speech is recognized by combining HMM and WNN. Through the simulation analysis of students' reading speech recognition, it is shown that the speech recognition based on wearable motion sensor is feasible and the recognition method has good performance. In addition, the feasibility of wearable motion sensor in business English teaching is verified by the establishment of experimental class, which can promote students' English learning better.

The second article titled "Construction of Innovative Thinking Training System for Computer Majors under the Background of New Engineering Subject" by Guoxun Zheng, Xiaoxian Zhang, Ruojin Wang, Liang Zhao, Chengming Wang, Chunlai Wang is focused on cultivation of talents in computer major and cooperation between industry and university. Computer major has trained a large number of computer related talents for the society. The graduates of this major are an important force of social development, and also make a significant contribution to the development of the national economy. Paying attention to the new demand of social development for high-quality computer talents, targeted training is the key to the development of scientific and technological innovation. Firstly, this article points out the main problems affecting the cultivation of talents in this major. Then, based on the basic idea of a new engineering subject, it discusses how to renew the basic educational concept of computer major, strengthen the cooperation between industry and university, reform according to the requirements of new engineering subject, and realize incremental optimization, stock adjustment and cross-integration from various aspects.

In the third article with the title "Multimedia Teaching System Based on Art Interaction Technology" by Xiaozhong Chen aim is at improving the Massive Open Online Course (MOOC) platform, which is the largest application of hybrid learning. It integrates animation technology and multimedia technology, and designs a multimedia-teaching platform based on art interaction technology, which effectively improves the attraction of MOOC platform to learners. Firstly, this paper introduces multimedia, animation and interactive animation technologies in detail, and applies them to MOOC platform. Secondly, according to the analysis of the research results of teaching platform requirements, the design principles and system framework of this paper are given. Finally, the information processing system of B/S architecture mode is built to make the improved platform have high response speed and data processing ability. In addition, this paper constructs a small-scale multimedia hybrid learning platform for testing and finds that the multimedia teaching platform based on art interactive technology designed in this paper can well promote students' autonomous learning and improve the effect of students' learning.

The fourth article titled "The Research and Implementation Feasibility Analysis of an Intelligent Robot for Simulating Navigational English Dialogue Under the Background of Artificial Intelligence" by Wei Sun uses the test data set to test the analytical model of navigational English dialogue instructions. The experimental results show that the conditional random field (CRF) + domain dictionary + ambiguity resolution method has the

highest segmentation effect. The calculated percentages of the analytical model are correct rate: 76.85%; recall rate: 80.36%; F-value: 88.46%. This paper implements a robot teaching and reproduction method based on simulated navigational English conversation and human-computer interaction under the background of artificial intelligence, and designs robot motion realization experiments and speech recognition experiments. The three-dimensional error after fine-tuning the voice is between 1.6798mm and 2.9968mm. This article constructs a simulation navigational English dialogue robot system. The FAQ component has up to 79.2%; others have a lower accuracy rate of only 59.03%.

In the fifth article with the title “Interactive and Innovative Technologies for Smart Education” by Babatomiwa Abdulazeez Omonayajo, Fadi Al-Turjman, Nadire Cavus the focus is on new concepts and ideas that have been recently emerged in the process of obtaining and disseminating cognitive, ethical, and public knowledge. In the current state of education, a learner, tutor, and the knowledge being transferred are all present, and smart education has made learning more flexible and convenient. This concept is accomplished through the use of smart devices and technologies that are interconnected to access digital resources. Smart education refers to a new way of learning that has gotten a lot of attention, notably during the 2020 COVID-19 Pandemic. This article examines the technologies that have aided smart education in achieving its educational goals. With smart technological solutions, modern technologies are enhancing the teaching - learning process in today’s education. Smart education, with the help of sophisticated technology, simplifies the activities of teaching, learning, networking, and cooperating, as well as making speedy alerts more productive.

The next article titled “The Impact of Digital Transformation in Teachers’ Professional Development During the COVID-19 Pandemic” by Ayden Kahraman, Huseyin Bicen presents a study conducted to reveal the positive and negative aspects of professional development programs applied to teachers involved in distance education during the COVID-19 process and investigate whether they contributed to the digital transformation with the competencies they acquired through these programs. A total of 30 teachers participated in the study voluntarily. The research has been carried out as a case study. In order to ensure the validity, reliability, and consistency of the data, the mixed research method consisting of the qualitative and quantitative phases has been used for acquiring data. Once the teacher-oriented professional development program was completed, the teachers were subjected to an achievement test and a self-assessment questionnaire. A focus group interview was conducted to collect various views of 18 teachers regarding the program. This study also reveals that teacher-oriented professional development programs can be applied efficiently through online education and have a crucial role in strengthening and enhancing the technical competencies of the teachers involved in distance education.

The last article titled “Data mining technology in the analysis of college students’ psychological problems”, by Jia Yu, and JingJing Lin expounds on the research status of data mining and the status quo of college students’ psychological health problems, deeply analyzing the feasibility of introducing data mining technology into the analysis of college students’ psychological health. After studying and analyzing the decision tree technology of data mining, and taking the psychological health problem data of the students in a university in 2021 as the research object, this paper uses the decision tree to analyze the psychological health problem data. The main work includes the following: determining the mining object and mining target; preprocessing the original data; and according to

the characteristics of the data used, choosing the decision tree algorithm to construct the decision tree of the students. Finally, based on the analysis and comparison of the decision tree model before and after pruning, classification rules are extracted from the optimal decision tree model, thus providing a scientific decision-making basis for mental health education in colleges and universities.

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