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Lorna Uden · Dario Liberona (Eds.)

Learning Technology for Education Challenges

9th International Workshop, LTEC 2021
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Proceedings

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Preface

Welcome to the proceedings of the 9th International Workshop on Learning Technology for Education Challenges (LTEC 2020/2021) held at the National University of Kaohsiung, Taiwan, during July 20–22, 2021. Owing to the unique circumstances brought about by the COVID-19 pandemic, LTEC 2020 was postponed and subsequently merged with this year's edition of the conference, which was held in a hybrid format with both in-person and online presentations.

Technology has brought about various changes in the way education is delivered and received. From self-learning to the flipped classroom approach, technology is making a considerable impact on learning and teaching methodologies. Because of the numerous benefits offered, digital learning has become an important part of the education system. Teaching and learning methods have undergone a significant change due to all the trends in educational technology. Every year, new trends emerge to provide something new to the learners. Schools and universities are trying to implement the latest in education technology to improve the teaching and learning process. There are many current trends in learning technology.

Collaborative learning is one of the key features in twenty-first century education, since peer-to-peer learning incorporates the social learning trends that are so widespread in modern society. Collaborative learning technology can enhance problem solving and communication skills and foster creativity, complementing the goals of higher education. This collaborative learning approach helps students to interact with their peers and build their interpersonal skills.

Virtual reality (VR) presents realistic scenarios for students and helps them gain valuable hands-on experience that otherwise would not be available. Their digital environments prompt higher comprehension and retention rates than traditional classroom settings. VR transformative potential will grow exponentially. Lower costs will push institutions to invest heavily in these effective, engaging training tools.

Gamification has been gaining popularity because it increases student engagement. It incentivizes students to learn and practice, improving the overall learning process. Artificial intelligence will continue to increase within educational settings because it helps personalize and streamline instruction. Machine learning can evaluate a student's competencies, find weak areas, and then present supporting materials.

Blockchain technology is a decentralized, transparent way to transact data. There are many ways blockchain can transform education. Schools can use blockchain for cost-effective cloud storage options and for securing student record transfers. Blockchain technology can also make its way into Massive Open Online Courses (MOOCs) and E-portfolios as ways to verify skills and knowledge. Educational institutions are starting to look at learning analytics to optimize learning. Educators can use it to predict student behaviour, design curriculum, and map learning interventions.

Cyber threats have been a cause of worry for many institutions - educational and otherwise. Education institutes are implementing the best data security measures to

protect their online data and their students' interests. Cybersecurity, therefore, is an important research area for learning technology. Mobile learning is gaining popularity in middle management training. Companies updating learning to include the latest mobile and live online learning technology can expect to drive higher levels of engagement and learning effectiveness.

Besides the technological advances, there is also a need for innovative pedagogy, which may include playful learning, learning through wonder, action learning, making thinking visible, virtual studios, and so on.

The aims of LTEC 2020/2021 were to examine how these technologies and pedagogical advances can be used to change the way teachers teach and students learn while giving special emphasis to the pedagogically effective ways we can harness these new technologies in education; to provide a platform for research in the very broad area of educational technology that bridges theory, research, practice, and policy; and to offer participants an overview of the current situation of education and new learning technologies.

The proceedings consisted of 17 papers covering various aspects of technologies for learning including:

- Learning tools and environment
- E-learning and transferability strategies
- Serious games technologies
- Learning practices and knowledge transfer

The authors of the papers hailed from many different countries including Austria, Chile, Colombia, Ecuador, Finland, France, Greece, Italy, Malaysia, Slovakia, Slovenia, South Korea, and the United Kingdom.

We would like to thank the authors, our reviewers, and the Program Committee for their contributions and to the National University of Kaohsiung, Taiwan, for hosting the conference. Special thanks go to the authors and participants at the conference. Without their efforts, there would be no conference or proceedings.

We hope that these proceedings will be beneficial for your reference and that the information in this volume will be useful for further advancements in both research and industry related to Learning Technology for Education Challenges.

July 2021

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