

# Preface

With technology integrated into education, various best practices in innovations of infusing technology into education have emerged in different parts of the world. However, there is a problem of scaling up these innovations to promote using technology in education for smart learning. With the purpose to promote innovative use of technology in education to scale-up educational innovations all over the world, this edited volume is composed of 14 best practice cases on technology enhanced educational innovations. Experts from Turkey, Tunisia, Cyprus, Italian, Malaysia, China, India, and Finland have contributed to these cases, providing the current state of the art in the use of technology in education in their counties. Topics cover the best practices of smart classroom building, effective use of tablets and interactive whiteboards, virtual learning environment, digital learning spaces, game-based learning, synchronous remote classroom, micro-lectures, and so on. The book therefore covers new emerging technologies and pedagogies in different countries for promoting learning effectiveness.

Chapter 1 by the editors provides a framework of Context-Input-Process-Output (CIPO) to analyze and evaluate the status of ICT in education in a region which is the basis of utilizing the cases of best practices in the local context. The key components of case studies for ICT in education are discussed and some suggestions are given to promote the scale-up of innovative cases for utilizing ICT in teaching and learning.

Chapter 2 by Petek Aşkar, Arif Altun, Nurettin Şimşek, and Selçuk Özdemir describes a pilot project with the purpose of evaluating the effectiveness of tablet PCs and interactive/smart whiteboard for 9th grade students and their teachers in Turkey. In the case, they found that (a) teachers think that interactive/smart whiteboard would have more impact, whereas students consider tablet PCs would have more impact and (b) students are more anxious about using tablet PCs and interactive whiteboards during instructional processes than teachers.

Chapter 3 by Sadegül Akbaba Altun and Hale Ilgazb provides students', teachers' and administrators' firsthand experiences on using tablet PCs in their schools from a qualitative paradigm in Turkey. It was found that students preferred

tablet use for entertainment, communication, and educational purposes. Teachers had doubts about the educational benefits of tablet PCs. Administrators faced mainly the technical problems.

Chapter 4 by Dr. Riadh Besbes is a study from Tunisia entitled *Teaching and Learning Effectiveness Enhancement Project “TLEEP”*, with the aim to improve teaching and learning effectiveness within academic institutions by exploiting data mining methods on collected databases for educational knowledge extraction. It is claimed that the project’s data mining strategy in the educational context could support and develop teachers’ expertise, enhance and scaffold students’ learning, and improve and raise the education system’s performance.

Chapter 5 by Dr. Riadh Besbes introduces a project of *Learning Effectiveness Enhancement Project (LEEP) from Tunisia*, which creates productive, student-centered learning environments that have the following overarching objectives: improve ability to personalize learning and individual progress, enhance student engagement and motivation, strengthen teaching effectiveness, equip teachers and stakeholders with useful data that helps to shape interventions, sharpen educational policies, and lighting learning pathways.

Chapter 6 by Dr. Riadh Besbes introduces the project *Teaching Effectiveness Enhancement Project (TEEP)*. This study aims to improve teaching effectiveness within academic institutions by measuring observational data, collecting them in databases, and extracting knowledge from them using intelligent processes. An intelligent system is designed, able to help to assess in quantifiable terms, 35 educational concepts from teachers’ practices, attitudes, and behaviors in learning contexts within the class session. This study finds that all processed results on educational concepts can be automatically generated by this system.

Chapter 7 by Vimala Judy Kamalodeen, Trinidad and Tobago investigates whether teachers are ready for the new digital learning spaces. Results show that teachers preferred asynchronous tools such as blogs over synchronous tools such as chats and chose to participate when and how they wanted. Findings also showed a preference to reading over writing.

Chapter 8 by Betul Yikici, Zehra Altinay, Fahriye Altinay, Gulyuz Debes, and Yusuf Deviren discusses how to develop teachers’ ability through three cases in Cyprus. Awareness of ICT competence and digital literacy through trainings for all target groups are very essential in developing countries. It has been observed that teachers help each other for the new trends, which shows their enthusiasm. The education ministry should make mandatory in-service training activities for digital citizenship and digital literacy.

Chapter 9 by Earp, Jeffrey, and Dagnino Caponetto introduces pilot experiences performed in the MAGICAL project in game making for learning from Italy. They found the experience appeared to have particular benefits for enhancing learner motivation and engagement, and for triggering collaborative attitudes and behavior. They also found there was a need to ensure that the technological infrastructure is properly prepared and managed, and functions as expected; other lessons learned from the case were also discussed.

Chapter 10 by Mei Lick Cheok and Su Luan Wong introduces the study of teachers' experience by using FROG Virtual Learning Environment in Malaysia schools conducted by the Ministry of Education (MOE). After discussing the outcomes of the project, a few challenging areas that the MOE will still need to look into to ensure sustainability and scalability of the programme are put forward.

Chapter 11 by Hsien-Sheng Hsiao and Jyun-Chen Chen introduces a smart classroom project to spread inquiry-based nature science courses for elementary school in Taiwan. The research guides the concept of the standard operating procedure, which means everything has its standard operating procedure to ensure effectiveness and quality; this is also beneficial for large-scale promotion.

Chapter 12 by Mari Petrelius, Mikko-Jussi Laakso, Ilkka Jormanainen, and Erkki Sutinen introduces a case from Joensuu region in Finland, with the aim to improve teachers' ability to use ICT toward the level needed for the implementation of the new K12 curricula. The new Finnish K12 curricula is characterized by the use of ICT as both a tool and a learning outcome in all the subject areas.

Chapter 13 by Imran A. Zualkernan and Asad Karim describes the use of a host of learning technologies to provide just-in-time teacher training and mentoring and technology-based formative assessments to remote rural schools in Pakistan. The case study deals with improving numeracy skills for grade 5 students in government schools that have little or no ICT infrastructure.

Chapter 14 by Liang Yu and Shijian Chen introduces the case of Chengdu No. 7 online school in which Synchronous Remote Class (SRC) is one of the methods to solve the shortage of high quality teachers in rural areas in China. SRC uses the video conferencing system to connect K-12 classes in developed and undeveloped areas to share the high quality teacher's class with cyber face-to-face communication between classes.

Chapter 15 by Yongbin Hu, Jinbao Zhang and Ronghuai Huang introduces a typical government-led project "J class" microlecture project, which is an ICT in education project with the vision to provide quality learning resources, support individualized learning, and balance district-wide education in Putuo district, Shanghai.

ICT is playing a significant role in education in the digital age, and learning is being reshaped by various educational technology innovations. This book captures those innovations in the form of best practices from different parts of the world. Teachers, school administrators, policy makers, and also researchers from all over the world are expected to benefit from this book on how to integrate technology into teaching and learning in K-12 schools. It is also our editors' aim to achieve through our efforts.

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