

Preface

During the past years, the increased interest in applying digital technologies aiming to improve learning and teaching has led to significant growth of research and practice of ICT in education. Educational stakeholders recognize the role of ICT as a key enabler of innovation and creativity in K-12 schools and for learning in general. They also highlight that, although the infrastructure to promote ICT use for learning and a sound research base to guide the process are widely available, the full potential of ICT is not being grasped in formal education settings. To this end, this book aims to capture the differences of ICT-based innovations for promoting the effective application of ICT in education by a number of invited chapters in key research areas.

The book is structured into five parts.

Part I: Patterns of Innovation for Instructional Models

The first part includes two chapters. Marlene Scardamalia and Carl Bereiter discuss the meaning of knowledge building/knowledge creation and importance of transformation from teaching for understanding to knowledge building. They argued that the goal of spanning Knowledge Building theory, pedagogy, and technology was to recreate schools as knowledge creating organizations—a formidable educational challenge requiring a shift in the modes of thought that since ancient times have characterized education. Jinbao Zhang and Linglin Meng discuss the ICT supported instructional innovative practice and diffusion mechanism of K-12 in China.

Part II: Methods to Design Learning

The second part consists of three chapters. Michael Spector discusses some issues for ICT supported instructional design by considering the emerging technologies and challenges for effective design of instruction. The chapter also discusses how to prepare educational technologists and the logic models to advance research, design and practice. Chee-Kit Looi, Daner Sun, and Wenting Xie present the importance of informal learning, considering the concept of seamless learning. Some major concepts were discussed and methods were provided for integrating informal learning into formal learning in this chapter. Di Wu, Xiaorong Yu, and Jingyang Rao compare the differences of ICT infrastructure construction status in China and the United States from broadband access, classroom environment and popularity of terminal equipment. The authors also summarize the experience for infrastructure construction of ICT in education from three aspects.

Part III: Development Model of Digital Learning Resources

The third part consists of two chapters. Liang Yu, Chuqian Sheng, and Di Wu introduce the background, purpose and tasks included in the Teaching Site covered by the Digital Education Resources Project promoted by Ministry of Education in China to bridge the digital divide between the Western remote rural areas. Allison Powell's chapter provides a brief description of the field of K-12 online and blended learning in the United States, and an overview of the types of digital content available to K-12 students and teachers. She also discusses how content is developed along with the pros and cons of building content in contrast to purchasing content from a publisher.

Part IV: Promoting e-leadership Using ICT

The fourth part includes three chapters. Stylianos Sergis and Demetrios G. Sampson analyze the 70 existing school leadership decision support systems (SL-DSS), to gather insights that could drive future implementations of school leadership decision support systems towards providing more effective decision support affordances and tackling the identified shortcomings of existing systems. Glen Bull, Nigel Standish, Eric Johnson, and Hossein Haj-Hariri introduce the successful use of digital manufacturing in a Lab School in the US, and point out that central coordination and planning can facilitate effective use of digital manufacturing technology in schools. Martina A. Roth and Jon K. Price introduce the Intel Education Transformation Model, and discuss the effectiveness and impact of the Intel Teach

Leadership Forums in informing and supporting school leaders, such as increased support through funding, time release, priority status, interest, and involvement.

Part V: Enhancing Teacher Development Using ICT

The fifth part consists of three chapters. Daniel Mourlam and Mary Herring review the integration of ICT through the development of pre-service teacher Technological, Pedagogical, Content Knowledge (TPACK), as well as how the Intel Teach Elements (Elements) have been used to develop teacher knowledge of pedagogy and technologies. David A. Slykhuis and John K. Lee explore the application of TPACK and 21st Century Learning Design (21CLD) which are the two conceptual frameworks form the cornerstone of Technology Enriched Instruction (TEI) professional development workshop to promote the effective use of technology in the classroom. Punya Mishra, Danah Henriksen, Liz Owens Boltz, and Carmen Richardson develop a definition of e-leadership that extends from the business sector to encompass educational contexts. They used the Replacement, Amplification, and Transformation (RAT) framework to explain the varying degrees to which ICT has been used in business and education and relate this model to the research in e-leadership and teacher development.

We hope this compilation will benefit learners, educators, scholars, and trainers by providing them with insight into innovative K-12 school strategies. We would like to extend our gratitude to all those who contributed material, provided support, collaborative discussions, review, commentary, and assistance in the editing, proofreading, and development of this text.

Ronghuai Huang
Kinshuk
Jon K. Price



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