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Educational Technology

A Primer for the 21st Century

Springer

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Preface

Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources. From the perspective of technology used in education, educational technology could be understood as the use of emerging and existing technologies to improve learning experiences in a variety of instructional settings, such as formal learning, informal learning, non-formal learning, lifelong learning, learning on demand, and just-in-time learning. Educational technology approaches have evolved from early uses of audiovisual aids to individual and networked computers, and now have evolved to include various mobile and smart technologies, as well as virtual and augmented realities, avatar-based immersive environments, cloud computing, and wearable and location-aware devices. Various terms have been used along the way to refer to educational technologies, such as learning technologies/environments and instructional technologies/systems. We have embraced a broad interpretation in this book to cover instructional design approaches, learning strategies, and hardware and software. Our view is that anything that consistently can support learning and instruction can be considered an educational technology. Some educational technologies are simple and have existed for many years; others are complex, and new ones are finding their way into educational settings every day.

Educational technology focuses on both the technical and pedagogical ways and means of supporting learning and instruction. It is the basis for the success of the e-learning revolution in recent years. Technology-based instruction can surpass traditional classroom-based instruction in quality by providing a wide variety of affordances and capabilities that can promote motivation and result in engaging, efficient, and effective learning.

The demand for educational technologies has been rising steadily; e-learning is a huge and expanding worldwide industry. Commercial e-learning companies, training departments in large companies and organizations, computer software companies, and educational institutions over the world employ large numbers of specialists in various aspects of educational technology creation (programming, graphic design, instructional design, task analysis, usability engineering, subject matter analysis, editing, etc.). However, these organizations often find it hard to employ suitably qualified workers who have knowledge beyond their subfields and disciplines. There is a strong demand for technologists who understand learning

theories and for instructional designers and educators who understand technologies and how to effectively integrate technology into learning and instruction. The field of educational technology is becoming part of major educational programs in institutions worldwide. The commercial training industry is large and still going through a period of rapid and sustained growth, based in large part on the integration of advanced digital technologies.

The needs and requirements of the various organizations, both educational and commercial, vary widely in terms of the knowledge and skills needed to implement educational technology solutions effectively. Further complexity comes from the fact that potential students of educational technology exist at different levels and in a variety of contexts; potential students come from a variety of backgrounds, ranging from education, computing, engineering, design, arts, the humanities, finance, and the natural sciences. Their interests and expectations vary as widely as their aspirations toward what kind of organizations they would like to serve after their studies. The aim of this book is to prepare students with the knowledge and skills to understand the organizational needs and requirements, and not only use and manage existing and emerging technologies effectively, to be able to apply associated pedagogies and instructional strategies appropriately and effectively, to evaluate and manage educational technology solutions, and to foresee and prepare for future possibilities.

This book is targeted toward readers who are interested in educational technology and would like to understand educational technology from different perspectives. Specifically, this book could be used as textbook for two types of undergraduate students: (a) those who are looking for careers in educational technology, instructional design, or media and information systems, or may want to continue their studies in graduate programs in learning and instructional technology and (b) those who are interested in becoming teachers in K-12 settings or trainers in industry and who need a strong background in educational technology. This book will also act as a valuable resource in teacher education programs where the primary focus on mainstream education requires an authentic resource in instructional design and educational technology.

Keeping in mind the varied needs of the organizations, employees, and potential students, this book adopts a competency-based approach to learning and assessment. The themes and topics take a multi-disciplinary approach and are aimed at preparing students for competent and innovative educational technology professionals. The approach taken in this book aligns with the recommendations of the suggested curricula for advanced learning technologies developed by a task force of the Institution of Electrical and Electronics Engineers' Technical Committee on Learning Technology led by Roger Hartley (with Kinshuk, Rob Koper, Toshio Okamoto, and Mike Spector) and published in 2010 (see http://www.ifets.info/journals/13_2/17.pdf).

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