Preface

The transition from information-based economy to knowledge-based society requires having effective technological tools, resources and efforts that contributes improving higher education and its educational processes. Hence, the evolution of Information and Communication Technologies (ICTs) helps to extend knowledge beyond geographical boundaries and influencing all aspect of human life with aims to promote opportunities of knowledge sharing independent on time and space constraints. In addition, such evolution has potential and effective role in reforming education that facilitates exchanging information, communication and exploration to strengthen the teaching, training and learning process, and transform it into an innovative form of experience that assure quality outcomes. Furthermore, information rich society promotes new practices and paradigms for education and incorporates better pedagogical methods making teaching learning process more productive.

Online education covers both e-learning, blended learning and distance learning, as it generally refers to the use of online tools and resources for learning. The categorizations of online education depends on the amount of online learning that is integrated into the course, ranging from face-to-face learning to blended learning to completely online activities. In addition, technology-based training emerged as an alternative to instructor led training to comply with the demand of continual life-long learning and professional development.

This book includes 14 chapters that contribute with the state-of-art and up-to-date knowledge on research advancement in the field of Online Education and Training. The chapters provide theoretical knowledge, practices, algorithms, technological evolution, applications and new findings. Furthermore, the handbook helps to prepare engineers and scientists who are looking to develop innovative, challenging and effective systems and value added ideas for and smart interdisciplinary software and systems to meet today's and future challenges.

CHAPTER 1: CLASSIFYING EDUCATIONAL ONLINE TECHNOLOGIES – A NEW MULTI-DIMENSIONAL TAXONOMY

The absence of a taxonomy comprehensive enough to guide EOT choice is a concern, given the current extent of online activity. This chapter addresses this issue and proposes a new taxonomic framework of Educational online technologies (EOTs) called the Pentexonomy. Developed by augmenting five existing taxonomies, the Pentexonomy synergizes a range of perspectives to produce a robust, contextualized and multi-dimensional classification that facilitates educationally sound decision-making on EOT activity.

CHAPTER 2: A PHENOMENOLOGICAL INTERPRETATION OF TEACHERS' ONLINE TECHNOLOGY EXPERIENCES WITH STUDENTS IN BLENDED TERTIARY ENVIRONMENTS

This chapter documents the interpretations of teachers' experiences with students, in reference to their use of three types of educational online technologies (EOTs): learning management systems, online video platforms, and online networking tools. These interpretations, which include descriptions of teachers' challenges using these tools, helped to inform a set of recommendations for effective EOT use, to assist tertiary education institutes (TEIs) to address technology-based challenges and meet their key stakeholders' needs.

CHAPTER 3: TECHNOLOGY-BASED EDUCATION – CHALLENGES OF BLENDED EDUCATIONAL TECHNOLOGY

This chapter a literature review focusing on the use of technology-based instruction by instructors or students was conducted. The results of the study demonstrated that technology-based instruction has significant effects on learners' achievements; however, there are some challenges such as social and technical barriers in blending technology and education in different educational contexts.

CHAPTER 4: LEARNING STYLES AND CULTURAL DIFFERENCES IN ONLINE LEARNING ENVIRONMENTS IN THE TWENTY-FIRST CENTURY

This paper revisits online learning environments in terms of differences in the learning styles of Nigeria university students according to their cultural backgrounds. Literature review was conducted with focus on culturally different learning styles in online learning environments. The chapter concludes that a person's learning style could affect how they react to any learning situation, including learning online; and hence, knowledge of learning style could help in the selection of appropriate instructional designs and teaching strategies for courses.

CHAPTER 5: CORE COMPETENCIES' CORE CONTEXT!

This chapter stresses the importance of putting core competence in its specific and accurate context to optimize its usefulness. Otherwise, the value might easily erode or even get totally lost. This research highlights core competence in the contexts of recruiting and educating IT project managers. This chapter follows-up on the prior research that proposes both recruitment and further training of IT project managers would gain from applying the core competence concept. Core competence must be considered in the light of end products and business value.

CHAPTER 6: DOES THE DEGREE OF ABSTRACTION OF INTERACTIVE VISUALIZATIONS AFFECT STUDENTS' LEARNING OF SURVEYING?

This chapter presents theories that guide the research on learning with visualizations, report different visualization taxonomies, and discuss the differences between realistic and schematic visualizations. In addition, it discusses surveying education and describes a study that investigated the effect of the type of visualization on students' learning of surveying practices. The study compared two virtual learning environments, one with realistic visualizations of terrains and instruments, and one with schematic graphical representations.

CHAPTER 7: HOW TO CREATE A PEDAGOGIC CONVERSATIONAL AGENT FOR TEACHING COMPUTER SCIENCE

Pedagogic Conversational Agents are computer applications that can interact with students in natural language. They have been used with satisfactory results on the instruction of several domains. This chapter describes MEDIE methodology to explain how to create an agent to teach programming to Primary Education children and develop their computational thinking. The main steps are: to communicate with the teacher team, to validate the interface, to validate the functionality, practical sessions and evaluation. The first two steps are covered in this chapter.

CHAPTER 8: E-LEARNING IN THE HASHEMITE UNIVERSITY – SUCCESS FACTORS FOR IMPLEMENTATION IN JORDAN

In this chapter, factors influencing user acceptance and adoption of Information and Communication Technologies (ICTs) in Jordanian higher education institutions necessary for the delivery of e-learning activities are being handled. The attitude toward ICT and e-learning is measured to understand how ICT and e-learning would be accepted by applying the Diffusion of Innovation (DOI) theory. The results showed a significant relationship between student's perception of technology characteristics and their attitude towards using the technology in the educational system.

CHAPTER 9: SEISMIC RISK COMMUNICATION – THE CASE OF PREPARATORY SCHOOLS IN MEXICO CITY

The chapter presents some aspects of the seismic risk communication within a Systemic Disaster Management System (SDMS) model. Information and communication technology (ICT) plays a key part in managing natural disasters. The chapter introduces a case study of seismic risk preparedness for the case of preparatory schools in Mexico City to illustrate this feature of the model and assess its outcomes.

CHAPTER 10: RETHINKING TWITTER – UNIQUE CHARACTERISTICS OF TWITTER RENDER IT AN INSTRUCTIONAL ASSET

This chapter presents a framework for using Twitter as an instructional review tool, leveraging its timely, unique, and efficient communication style while incorporating theories of memory and cognitive psychology that are more than two centuries old. Applied practice study examples are introduced showing how Twitter may be used as a means for distributed practice in learning concepts.

CHAPTER 11: PROFESSIONAL DEVELOPMENT IN THE TWENTY-FIRST CENTURY – YOUTUBE TEACHER TRAINING AND PROFESSIONAL DEVELOPMENT

The purpose of this chapter is to examine one professional development opportunity using the video-sharing tool, YouTube, as a training modality for in-servicing teachers. For this study, the researchers conducted interviews with eight educators in the United States to analyze their perceptions about the YouTube teacher training method. The results of the study indicated that the YouTube training tool is a quality training tool to assist teachers in the implementation of teaching strategies, and also reinforce in-person training.

CHAPTER 12: THE REALITY OF USE OF WHATSAPP AS A TOOL FOR DISTANCE EDUCATION IN TEACHING AND LEARNING – THE CASE OF THE FACULTY MEMBERS AT THE DEPARTMENT OF INFORMATION STUDIES AT SULTAN QABOOS UNIVERSITY

This research aims to investigate the reality of WhatsApp use among faculty members at the Department of Information Studies (IS) at Sultan Qaboos University (SQU) in the Sultanate of Oman as a tool for distance education (DE) and as a tool for teaching and learning. In addition, it focuses on the information retrieved on WhatsApp teaching groups and its use. The results of the work showed that three faculty members out of nine are using WhatsApp in teaching and learning. They use it for class discussions and explanations of projects. In addition, the study showed a relationship between age, nationality and specialization. The study also proved that students used WhatsApp as an open source of information.

CHAPTER 13: MANAGING THE KNOWLEDGE FOR AN E-TOURISM CURRICULUM – A KNOWLEDGE SUPPLY CHAIN APPROACH

For the purpose to improve the quality of education and meet industry and society needs it is necessary to have a holistic management of the curriculum design and development process. This chapter introduces an empirical research in Thailand that proposes a Knowledge Supply Chain (KSC) approach as a potential solution that integrates theories and practices of Knowledge Management (KM) and Supply-Chain Management (SCM) to design an e-tourism curriculum in the context of the Greater Mekong Sub-region (GMS).

CHAPTER 14: INFLUENCE OF CONTEXT IN TEACHERS' PERCEPTION OF GRAPHING CALCULATOR USE IN MATHEMATICS INSTRUCTION

This chapter focuses on the influence of socio-contextual factors in the interrelations between teachers' perceptions of the role of graphing calculators, as mediating tools, to help facilitate mathematics instruction of students from two different SES backgrounds. To better understand the role of SES socio-context, this study suggests a framework, consisting of teacher, student, subject matter, and graphing calculator use, for graphing calculator integration in the classroom. As such, addressing equity issues in connection to the successful integration of graphing calculator in the classroom requires continually creating, maintaining, and re-establishing a dynamic equilibrium among all components of the framework.

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