Preface

*Education is the kindling of a flame, not the filling of a vessel. - Socrates*

The future for online has never looked brighter. As technology improves and faculty continue to innovate, learners will have opportunities to participate in quality educational programs that fit their lifestyle and academic needs. The art of teaching is awakening the natural curiosity of young minds for the purpose of satisfying it afterwards. Teaching is a combination of concepts, theories and practical experiences. Successful teaching is the one that utilizes concepts and applications that are useful in the real world as well as ones that are interesting to learners. I believe that learners are valued customers that deserve the highest quality education and hope the ideas in this book help you to relate effectively to them, and to see them mature in their motivational orientation and wisdom. As Albert Einstein stated, “Learning is not a product of schooling but the lifelong attempt to acquire it.” We hope that you will find a strong value proposition in this book of new ideas and resources to enhance learning in your online courses.

The book seeks to explore the impact of Web-based technology on the design, implementation and evaluation of the learning and teaching process, as well as the development of new activities, relationships, skills, and competencies for the various actors implied in such processes. Learning activities should be embedded within the learning environment, and that the operation of the mediating tools should be designed to facilitate group cohesion and to promote social interaction among learners. Teaching and learning needs to become shared experiences. The chapters in this book are engaging, thought provoking, participative, and reflective spanning a wide spectrum of related issues with content drawing from theory, research, practice, individual experience, and insight by leading scholars, theorists, and practitioners worldwide.

The proliferation of Web-based technologies during the last decade may have given the impression of wide-spread changes in educational practices. In fact, we have only begun to scratch the surface of experiencing the vast impact these technologies could have on education. Viewed separately, Web-based technologies offer exciting possibilities for expanding the capacity to provide access to instruction and knowledge world-wide. However, and perhaps more importantly, viewing these technological advancements in a more dynamic context, forces educators and researchers to rethink the fundamental processes of teaching and learning. It’s not just a simple matter of using a technical tool to supply time and place ubiquity but to accept the challenge of understanding the implications for the entire educational spectrum. Web-based teaching and learning begs the question of what exactly these technologies means for
learners, teachers, program designers, academic experts, technical and administrative staff, institutional decision makers, training managers, publishers, and others. Although a considerable amount of exploration has been conducted regarding web-based learning technologies, the breadth and scope for dialogue and experimentation needs to be broadened. The chapters in this book provide a place for the dialogue and support of a diverse community interested in taking the challenge further.

This book provides educators, researchers, practitioners, and graduate students with insight into all areas affecting teaching, learning, research, and practice, sharing innovative pedagogies and inspirational insights into online education, and technology.

Next I provide a description of the importance of each chapter in this book and its contribution to theory and/or practice.

Chapter 1, “Can Educational Approaches Help to Revolutionize Quantitative Solutions for Climate Change?,” focuses on global climate change and its driving forces from a both didactic and scientific perspective. It suggests a technology-oriented quantitative approach for the sharing of hypotheses, scenarios, political applications, and didactic strategies related to planning, developing, managing, using and evaluating technological targets towards climate protection and global sustainability in academia, administration, education and policy consulting. The complete logical chain of cause and effect from social drivers to CO2 emission and climate change is used as an educational basis for advocating the global necessity and potential technological feasibility of CO2 reduction.

Chapter 2, “Towards Design of High-Level Synthetic Sensors for Socially-Competent Computing Systems,” presents a conceptual model for high-level synthetic sensor design in present-day Web x.0 mediated socially-competent computing systems. The aim is design of computing systems that are able to operate on the social level of description of a situation in a way similar to people reading social cues. The overall perceptive ability of human vision relies on high level, integrative sensors for detecting complex diffuse influences. It is proposed by the current approach that the recognition of the agent’s attitude by the synthetic sensor can help identify correctly the intention for the action by considering the attitude being the more general context of the emerging situation-dependent intention. Possibilities for application of the proposed theoretical approach to education of people with special learning needs or style are discussed.

Chapter 3, “Diversifying Computer Science at the Intersections of Creativity and Culture,” describes how the merging of abstract formal structures, material creative practice, and cultural knowledge from the concepts of creative medium approach and indigenous knowledge approach, can improve under-represented student performance, and foster learning practices in computing that offer broader forms of social expression and deeper STEM engagement for all students.

Chapter 4, “Success Models Using Knowledge Seekers’ and Experts’ Response For Knowledge And E-Learning Portals,” presents a comprehensive summary on the frameworks and metrics which are useful for evaluating the knowledge systems and portals. It also explores the relationship of knowledge seekers and expert’s response in addition to other feedback and provides a literature survey and description of service based technology framework which will be helpful for evaluating the effectiveness of the E-learning portals and/or KM Systems. This chapter provides a comparative summary on four success models and factors for evaluating knowledge systems and E-learning portals.

Chapter 5, “A Proposed Protocol of Multimedia Optimized Production for STEAM E-Learning,” focused on the Science, Technology, Engineering, Arts, and Mathematic (STEAM) fields, reviews literature on the effectiveness of animations for the classroom and online environments, and examines
why some projects work while others do not. While addressing the problems that arise when using on-demand animation, it proposes a unique protocol that practitioners and researchers can utilize in the production of their own educational animation.

Chapter 6, “Use of Community of Practice Dimensions in Community-Based Teacher Professional Development,” examines the key Communities of Practice (CoPs) dimensions in teacher professional development (TPD) as expounded in Wenger’s (1998) framework, and investigates their use in the English cohort’s TPD. The findings reveal that although key CoP dimensions were present, several factors inhibited teachers’ participation in the community. It can be implied that it is crucial to consider these factors in developing online CoPs for teachers in Malaysia.

Chapter 7, “An Intelligent and Adaptive Hypermedia System based on Thinking Style (IAHS-TS),” discusses the design, development, and implementation of an adaptive and intelligent hypermedia system, AIHS. This e-learning system was intended for bachelor degree program that is offered in all Algerian public universities. Content which was transformed into learning objects in four different ways in accordance with Herrmann Brain Dominance Instrument (HBDI). The developed prototype will assist a learner in accessing and using learning resources which are adapted according to his/her personal characteristics (in this case his/her thinking style and level of knowledge), and facilitate the learning content teacher in the creation of appropriate learning objects and applying them to suitable pedagogical strategies.

Chapter 8, “Innovation in Education Through Web-Based Instruction,” discusses the reconceptualization of the instructional activity of a WebQuest as a single or multi-player high-end multimodal experience with potential to stimulate student interest, motivate goal-directed learning behaviors, and positively sustain academic achievement and accomplishment. Suggestions for creating a WebQuest using emerging cross-platform methodology will be probed in order to examine their innovative potential both in teacher preparation and class instruction. Recommendations for utilizing a WebQuest to digitally enable both students and pre-service teachers are also offered.

Chapter 9, “Implementing Web-Based Learning and Teaching using Mobile Technology,” emphasizes the benefits of mobile learning and presents a case study of the development of a mobile learning environment that facilitates interactive learning in a University environment. The system provides for the student mobile access to various functions that can improve the process of learning including assessment and provision of feedback to learners. The system was tested and evaluated with satisfactory results.

Chapter 10, “Web-Based Instruction Revolutionizes Environmental Systems Analysis,” describes how the social processes emerging in a five-level web-based negotiation game may be conceived in such a way that these form a sequence of growing and decaying intensity in various modes of social interaction. Similarly to individual learning in a classroom, a procedure could be applied to collective learning, namely to social procedures among humans who are starting to create institutional networks for combating global climate change – one of the most urgent tasks at present. A coordinate system of the four main social archetypes of action, namely “information”, “team”, “debate”, “integration” is symbolically called soprano, alto, tenor and bass; these four basic dimensions of social action tend to peak one after the other along a suitably designed gaming procedure.

Chapter 11, “Improving the Educational Effectiveness of MOOCs by Using Web-Based Information and Communication Technology,” analyzes the challenges of the current Massive Open Online Courses (MOOC) based educational models and suggest how they can adopt ICT tools to transform into MOOC 2.0 - the next generation of MOOCs. Many questions have been raised regarding the educational effectiveness of these MOOC models. In particular, the lack of personalization, social interactions, and credibility have been cited as some of the most important factors that create uncertainties regarding the
Preface

viability of the MOOC based educational models. In the last couple of decades, Web-based businesses including online retailers, electronic marketplaces and online portals have successfully integrated information and communication technology (ICT) led initiatives and evolved to become viable business models.

Chapter 12, “Exploring the Role of Web-Based Learning in Global Education,” explores the role of web-based learning (WBL) in global education, thus describing the theoretical and practical overview of WBL, the multifaceted applications of WBL tools in educational settings, the application of web-based language learning, the application of web-based problem-solving activities, and the significance of WBL in global education. The fulfillment of WBL is vital for schools that seek to serve students and educators, improve educational performance, enhance competitiveness, and reach continuous achievement in global education. Therefore, it is necessary for schools to explore their WBL, establish a strategic plan to usually check their technological advancements, and immediately respond to the WBL needs of students and educators. The chapter argues that applying WBL in global education has the potential to increase organizational performance and reach educational goals in the digital age.

Chapter 13, “Pentexonomy: A Multi-Dimensional Taxonomy Of Educational Online Technologies,” argues that educationalists have striven to adapt through knowledge development and application of online tools, but making educationally sound choices about technology has proved challenging, amidst the extensive and largely unclassified range of tools. The absence of a taxonomy comprehensive enough to guide EOT choice is a concern, given the current global extent of online activity. This chapter addresses this issue by proposing a new taxonomic framework of EOTs called the Pentexonomy. Developed by augmenting five existing taxonomies, all of which include current EOT insights gathered during 2014-15 interviews with blended learning experts, the Pentexonomy synergises a range of perspectives to produce a robust, contextualised, and multi-dimensional classification which facilitates effective decision-making on EOT activity.

Chapter 14, “The Relationship between Self-Regulated Learning and Personal Learning Environment (PLE) Management,” examines each of the four aspects of learner self-regulation in online learning (i.e., environment structuring, goal setting, time management, & task strategies) as the predictor for level of initiative and sense of control with regard to PLE widgets management in PLE. This study concludes that goal setting, time management, and task strategies in self-regulated learning can predict level of initiative in organizing PLE. Furthermore, goal setting and task strategies can predict sense of control in PLE management. Based on the study results, PLE Guidelines are suggested to support educators and learners to build and to manage their PLE.

Chapter 15, “Teaching Wireless Network Fundamentals using Low-Cost Wi-Fi Devices,” provides an opportunity for experiential learning where students can learn wireless networking fundamentals by hands-on practical activities using low-cost Wi-Fi (wireless fidelity) devices such as wireless cards and access points. Students can easily set up and configure networks using wireless cards and access points more effectively. By measuring network performance such as throughput and end-to-end delays, students are able to gain a deeper understanding of wireless networking. The effectiveness of Wi-Fi-based practical activities has been evaluated by students and the teaching team. This chapter reports on the overall effectiveness of teaching and learning of wireless network using radially available low-cost Wi-Fi cards and access points.

Chapter 16, “Helping Faculty Overcome Cultural Barriers to Adoption and Use of Web-Based Learning Technologies,” adopts a participatory action research (PAR) approach to identify and address some cultural factors that contribute in hindering faculty adoption and use of a Learning Management System (LMS) for Web-based learning at a university in Ghana. With a preliminary investigation reveal-
ing the possible role of cultural factors, this study drew on some aspects of Hofstede’s cultural dimensions theory to conceptualize a research framework, and subsequently engaged 10 faculty members in a semester-long action study. Findings show that by collectively identifying the cultural underpinnings, and conscientiously working on them, faculty members can change their attitudes (as well as those of their other colleagues) significantly, and be better disposed to integrating Web technologies into their instructional activities.

Chapter 17, “Towards Best Practices in Web-Based Learning and Teaching,” explores best practices in web-based learning and teaching with a view to discover trends and provide valuable information for all in the e-learning environment. It affirms that paradigms in Web-based education have shifted from teacher-centered to learner-centered but basically it remains synchronous or asynchronous. This requires Learning Objects (LO) to be pedagogically efficient, designed to standard (Multimodal) with designers bearing in mind the varied population and learning styles. LOs are to be personalized thereby creating adaptive content based on learner’s abilities, learning style, level of knowledge and preferences.

In conclusion this book impacts the field and contributes to the subject matter by adding to the body of knowledge regarding the multi-dimensional aspects of Web-based technologies in contemporaneous educational contexts, assisting researchers, practitioners, and decision makers to design more effective learning systems and scenarios. It explores the technical, social, cultural, organizational, human, and cognitive impact of technology in online education. In addition, this book endeavors a broad range of authors and expands the dialogue to address the interplay among the diverse and disparate interests affected by technology in education. In the spirit of continuous improvement, I encourage you to use the ideas in this book to create online communities that extend learning beyond the traditional classroom; provide flexible, collaboration tools for students; and generate rich, interactive and up-to-date course curriculum. As Henry Adams stated, “They know enough who know how to learn.” May this book help you become an enthusiastic learning facilitator and exemplify passion about the subjects that you teach.

*Learn from yesterday, live for today, hope for tomorrow. The important thing is not to stop questioning.* -- Albert Einstein