

Detailed Table of Contents

Preface	xviii
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Chapter 1

Can Educational Approaches Help to Revolutionize Quantitative Solutions for Climate Change?.....	1
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Gilbert Ahamer, Graz University, Austria

In order to apply web-supported education to solve one of the foremost issues revolutionizing our life on the planet Earth, this chapter focuses on global climate change and its driving forces from a both didactic and scientific perspective. It describes how to “tackle the task of a transition through technological targets” (T5). It suggests a technology-oriented quantitative approach based on the “Global Change Data Base” 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. Students negotiate global structural transitions and a set of CO₂ abatement measures (similar to the game “Surfing Global Change”).

Chapter 2

Towards Design of High-Level Synthetic Sensors for Socially-Competent Computing Systems.....	20
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The chapter 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

Design Agency: Diversifying Computer Science at the Intersections of Creativity and Culture..... 35

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The race and gender gap in US STEM education achievement reflects the legacy of historical forces which include colonialism and the exclusion of women in higher education. But it also reflects the decontextualized character of standard educational forms. We report on cSELF (Computer Science Education from Life), an intervention which brings together two alternative approaches. The “creative medium” approach offers a blank slate in which youth create their own innovations. The “indigenous knowledge” approach helps to translate traditional math and computing concepts into contemporary forms. Using the concept of “design agency” the authors describe how this merging of abstract formal structures, material creative practice, and cultural knowledge can improve underrepresented 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’ Responses for Knowledge and E-Learning Portals: Knowledge Systems and E-Learning Portal Evaluation..... 57

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The purpose of this chapter is to present a comprehensive summary on the frameworks and metrics which are useful for evaluating the knowledge systems and portals. In addition, this paper further explores the relationship of knowledge seekers and expert’s response in addition to other feedback. The primary goal of this chapter is to provide 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 proposed work also finds the correlation between the evaluation results of knowledge providers and seekers. The secondary part of 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..... 72

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There are many nuances to utilizing multimedia successfully as a pedagogical tool. With pressure for educational institutions to adopt e-learning tools such as online animations, it is important that a protocol be made to optimize the process and ensure students walk away with important content knowledge. Effective STEAM multimedia requires attractive aesthetics to engage viewers, research-based pedagogy to effectively educate viewers, and an efficient workflow that lowers costs. Focusing on the Science, Technology, Engineering, Arts, and Mathematic (STEAM) fields, this paper 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, we propose 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	92
<i>Puvaneswary Murugaiah, University of Science Malaysia, Malaysia</i>	
<i>Siew Ming Thang, National University of Malaysia, Malaysia</i>	
<i>Hazita Azman, National University of Malaysia, Malaysia</i>	
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The role of communities of practice (CoPs) in teacher professional development (TPD) is increasingly recognized. CoPs help teachers in a cohort to reflect on their practices, develop new skills and find motivation through mutual collaboration. With the affordances provided by Web technologies, the potentiality of online CoPs as a means of improving (TPD) has become a reality and is gaining popularity as the flexibility provided help teachers improve their instructional practices. The Online Continuing Professional Development for Teachers (e-CPDeIT) project aimed to develop three online CoPs; that is, English, Mathematics and Science communities among twenty Malaysian Smart school teachers. This paper examined the key CoP dimensions, as expounded in Wenger’s (1998) framework, and investigated their use in the English cohort’s TPD. The findings revealed 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)	111
<i>Mahnane M. L. Lamia, LRS Laboratory, University of Badji Mokhtar Annaba, Algeria</i>	
<i>Hafidi Mohamed, LRS Laboratory, University of Badji Mokhtar Annaba, Algeria</i>	

In this paper, an adaptive and intelligent hypermedia system, AIHS was designed, developed and implemented. This e-learning system was intended for bachelor degree program that is offered in all Algerian public universities, where the studied subjects are: “ORL”, “Dermatology”, “Ophthalmology” and “Language”. 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). It will 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: Digital and Cross-Platform Storytelling	131
<i>Roberta Levitt, Long Island University Post, USA</i>	
<i>Joseph M. Piro, Long Island University Post, USA</i>	

Technology continues to revolutionize the teaching and learning landscape opening up new possibilities to use new media to digitally enhance multiple literacies. The authors argue for 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.....	145
<i>Bolanle Adefowoke Ojokoh, Federal University of Technology, Akure, Nigeria</i>	
<i>Folasade Olubusola Isinkaye, Ekiti State University, Ado-Ekiti, Nigeria</i>	
<i>Olubimtan Ayo Doyeni, Federal University of Technology, Akure, Nigeria</i>	

Mobile technologies have increasingly become pervasive in everyday life over the past few decades. As a result of their affordability and wide availability, mobile devices have become commonly used by several people. Efforts are being made by researchers and institutions to provide infrastructure, content, and resources related to the integration of mobile devices into learning environments are worthy of note. These have led to the provision of more learner motivation, better interaction between learners and teachers, thus leading to an improved educational experience. This book chapter emphasizes on the benefits of mobile learning and also presents a case study of the development of a mobile learning system 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	162
<i>Gilbert Ahamer, Graz University, Austria</i>	

For university teaching in general, and specifically for the transdisciplinary curriculum of “Environmental Systems Analysis”, web-based learning procedures provide excellent opportunities for socially induced understanding and consensus building. This chapter 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.....	186
<i>Bhavik Pathak, Indiana University South Bend, USA</i>	

Massive Open Online Courses (MOOCs) have proved their cost effectiveness in extending the reach of the traditional classroom education to thousands of learners across the globe. However, 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 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. The focus of this chapter is to analyze the challenges of the current MOOC based educational models and suggest how they can adopt ICT tools to transform into MOOC 2.0 - the next generation of MOOCs.

Chapter 12

Exploring the Role of Web-Based Learning in Global Education..... 202
Kijpokin Kasemsap, Suan Sunandha Rajabhat University, Thailand

This chapter aims to explore 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..... 225
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Educational online technologies (EOTs) have revolutionised the delivery of online education, making a large contribution towards the global increase in demand for higher learning. 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 PLE Management..... 253

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Laura Sujo-Montes, Northern Arizona University, USA

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Is Personal Learning Environment (PLE) a new concept for effective teaching and learning? Shouldn't learning always be personalized and individualized? How may digital technology enhance PLE? Web 2.0 technology integration requires a higher level of self-regulated learning skills to create a PLE. This study examined 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 has concluded 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 281

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Teaching wireless networking fundamentals is often difficult because many students appear to find the subject technical, and dry when presented in traditional lecture format. To overcome this problem, we provide 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: A Participatory Action Research Approach 300

Stephen Asunka, Ghana Technology University College, Ghana

This study adopted 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. This followed a realization that an LMS that the university deployed for E-learning purposes, and had been available for over five years, remained largely unused by faculty members despite that they have been trained, motivated and appropriately resourced to do so.

With a preliminary investigation revealing 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..... 317
Mercy A. Iroaganachi, Covenant University, Nigeria

The chapter explored 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 (LOs) 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. It is recommended that educators have requisite background knowledge and competencies in technology such as hardware, software, and course management systems etcetera. Instructors, designers and all interested persons should consult a checklist of best practices, for assessing learning object repositories. More so, there is need to incorporate hands-on component into the e-learning environment. The chapter provides Indicators for best practices.

Compilation of References 333
About the Contributors..... 383
Index..... 389