Preface

This volume of Advances in Web-based Learning (AWBL) Book Series, entitled **"Solutions and Innovations in Web-Based Technologies for Augmented Learning: Improved Platforms, Tools, and Applications"**, includes a wide range of the most current research in the development of innovative Web-based learning solutions. It aims at providing an in-depth coverage and understanding of issues related to the implementation and application of Web-based technologies for facilitating and augmenting learning in diverse contemporary organizational settings.

In our present era, Web-based technologies offer numerous means for facilitating and enhancing learning in various contexts. Their exploitation should be in accordance with a series of technical, pedagogical, cognitive, social, cultural, and managerial parameters. This volume will assist researchers, educators, and professionals in understanding the necessary components for Web-based learning technologies and how to best adopt these elements into their own contexts, wehter being in classrooms, workgroups, communities, or world-wide organizations.

Chapter I, "The Role of Learner in an Online Community of Inquiry: Responding to the Challenges of First-time Online Learners" by Martha Cleveland-Innes, Athabasca University (Canada), Randy Garrison, The University of Calgary (Canada), and Ellen Kinsel, Odyssey Learning Systems (Canada), reports on findings from a study of adjustments to online learning environments. Using pre- and post-questionnaires, students enrolled in entry-level courses in two graduate degree programs at Athabasca University, Canada, and described their adjustments to online learning. Responses are analyzed in relation to the elements of cognitive, social, and teaching presence, which have been defined as core dimensions of learner role requirements in an online community of inquiry. Student comments provide understanding of the experience of first-time online learners, including the challenges, interventions, and resolutions that present themselves as unique incidents. Recommendations for the support and facilitation of adjustment are also made.

Chapter II, "Students' Attitudes toward Process and Product Oriented Online Collaborative Learning" by Xinchun Wang, California State University at Fresno (USA), focuses on the instructional design of applicable collaborative learning tasks that motivate sustained student participation and interaction. By providing data from a Web-based course offered in 2006 and 2007, this chapter investigates students' attitudes toward process and product oriented online collaborative learning. The analysis of 93 post course survey questionnaire data show that the overwhelming majority of students have positive experience with online collaborative learning. Data also suggest that students are more enthusiastic about process oriented tasks and their attitudes toward product oriented collaborative learning tasks are mixed.

Chapter III, "Cognition, Technology, and Performance: The Role of Course Management Systems" by Teresa Lang, Columbus State University (USA) and Dianne Hall, Auburn University (USA), describes an experiment conducted to determine the benefit to students of using course management systems. The effects of cognition, learning styles, and computer attitude were considered and eliminated to better

isolate any differences in performance. The data collected in this study supported the hypothesis that cognition influences performance. Learning style was found not to influence performance. Cognition and learning styles are frequently cited in the literature as influencing performance both with technology and without technology, so this finding partially supports the literature. Moreover, empirical evidence to support the benefit of course management systems in the learning process was not found in this study.

Chapter IV, "The Role of Organizational, Environmental and Human Factors in E-Learning Diffusion" by Kholekile Gwebu, University of New Hampshire (USA) and Jing Wang, Kent State University (USA), explores the factors that influence e-learning diffusion in contemporary corporations. Through the application of concepts from the literature on organizational change, innovation diffusion, and motivation, authors attempt to assess the factors that influence the diffusion of e-learning in organizations. Among these factors are organizational variables such as Organizational Complexity (specialization, function differentiation, professionalism) and Bureaucratic Control (formalization, centralization, vertical differentiation). Much attention is given to the factor of employee motivation.

Chapter V, "Distance Education: Satisfaction and Success" by Benjamin Martz, Northern Kentucky University (USA) and Morgan Shepherd, University of Colorado at Colorado Springs (USA), identifies five key components of satisfaction for distance education programs through a student satisfaction questionnaire and factor analysis. A questionnaire was developed using these variables and administered to 341 distance students. The results revealed five constructs for student satisfaction in a distance education program. Using these factors as guidance, this chapter extends those findings to provide some operational and administrative implications.

Chapter VI, "Group Support Systems as Collaborative Learning Technologies: A Meta-Analysis" by John Lim, Yin Ping Yang, and Yingqin Zhong, National University of Singapore (Singapore), presents a meta-analysis study aimed at gaining a general understanding of Group Support Systems (GSS) effects. Six important moderators in GSS experimental research are investigated: group outcomes, namely group size, task type, anonymity, time and proximity, level of technology, and the existence of facilitation. The results point to important conclusions about the phenomenon of interest. Their implications with regards to computer-supported collaborative learning technologies and use are discussed and highlighted along each dimension of the studied variables.

Chapter VII, "Knowledge flow and learning design models towards lifewide e-learning environments" by Maria Chiara Pettenati and Elisabetta Cigognini, University of Florence (Italy), considers the affordances of social networking theories and tools in building new and effective e-learning practices. In order to provide a guide for the design, development and improvement of e-learning environments, as well as for the related learning activities, this chapter proposes a knowledge flow model and the consequent learning design model, highlighting the stages of learning, the enabling conditions, and possible technological tools to be used. The proposed model is applied in a scenario of formal learning.

Chapter VIII, "An Agent-Based Framework for Personalized E-Learning Services" by Larbi Esmahi, Athabasca University (Canada), provides an overview of personalized e-learning services and related technology, and presents a multi-agent system for delivering adaptive e-learning. The author discusses the main issues related to personalization in e-learning: technology advancement and the shift in perception of the learning process, one size fits all vs. personalized services, and the adaptation process. The chapter also provides an overview of the most known implemented systems for adaptive e-learning, as well as a detailed description of the architecture and components of the proposed multi-agent framework.

Chapter IX, "Supporting Evolution of Knowledge Artifacts in Web-Based Learning Environments" by Dimitris Kotzinos, FORTH-ICS and TEI of Serres (Greece), Giorgos Flouris, FORTH-ICS (Greece), Yannis Tzitzikas, University of Crete and FORTH-ICS (Greece), Dimitris Andreou, FORTH-ICS (Greece), and Vassilis Christophides, University of Crete and FORTH-ICS (Greece), elaborates usage scenarios

and requirements for e-learning environments grounded on learning theories that stress on collaborative knowledge creation activities. Subsequently, this chapter presents a comprehensive suite of services, comprising an emerging framework, called Semantic Web Knowledge Middleware, that enables the collaborative evolution of both domain abstractions and conceptualizations, and data classified using them. The proposed suite includes advanced services for ontology change, comparison, and versioning over a common knowledge repository offering persistent storage and validation.

Chapter X, "Interface and Features for an Automatic 'C' Program Evaluation System" by Amit Kumar Mandal, IIT Kharagpur (India), Chittaranjan Mandal, IIT Kharagpur (India), and Chris Reade, Kingston University (United Kingdom), reports on an implemented system for automatically testing, evaluating, grading, and providing critical feedback for submitted 'C' programming assignments. The interface and key features of the system are described in detail along with some examples. The system gives proper attention towards the monitoring of a students' progress and provides complete automation of the evaluation process. It also provides online support to both the instructors and students and is designed for service-oriented integration with a course management system using Web services.

Chapter XI, "Evaluating Computerized Adaptive Testing Systems" by Anastasios Economides and Chrysostomos Roupas, University of Macedonia (Greece), investigates the current state of Computerized Adaptive Testing (CAT) systems and identifies their strengths and weaknesses. More specifically, this chapter evaluates ten CAT systems using an evaluation framework of 15 domains categorized into three dimensions: Educational, Technical, and Economical. The results show that the majority of the CAT systems give priority to security, reliability, and maintainability. However, they do not offer to the examinee any advanced support and functionalities. Also, the feedback to the examinee is limited and the presentation of the items is poor. Recommendations are given in order to enhance the overall quality of a CAT system.

Chapter XII, "Technology Integration Practices within a Socioeconomic Context: Implications for Educational Disparities and Teacher Preparation" by Holim Song, Texas Southern University (USA), Emiel Owens, Texas Southern University (USA), and Terry Kidd, University of Texas (USA), reports on a study that was performed in order to examine the socioeconomic disparities of teachers' technology integration in the classroom as it relates to implementing technology interventions to support quality teaching and active student learning. This chapter provides empirical evidence of whether these disparities continue to exist and if so, their effects on student achievement in the classroom.

Chapter XIII, "Utilizing Web Tools for Computer-Mediated Communication to Enhance Team-Based Learning" by Elizabeth Avery Gomez, New Jersey Institute of Technology (USA), Dezhi Wu, Southern Utah University (USA), Katia Passerini, New Jersey Institute of Technology (USA), and Michael Bieber, New Jersey Institute of Technology (USA), presents the results from pilot assessments of computer-supported team-based learning. Authors utilized pedagogical approaches grounded in collaborative learning techniques, such as team-based learning, and extended these techniques to a Web-based environment through the use of computer-mediated communications (CMC) tools. Their approach was examined through field studies duirng the course of two semesters at a U.S. public technological university. The findings indicate that Web-based CMC tools effectively facilitate team interactions and achieve higher-level learning.

Chapter XIV, "Accessible E-Learning: Equal Pedagogical Opportunities for Students with Sensory Limitations" by Rakesh Babu, University of North Carolina at Greensboro (USA), and Vishal Midha, University of North Carolina at Greensboro (USA), examines the accessibility, usability, and richness of course management systems (CMS) used for e-learning in institutions of higher education. A model is proposed that underscores the influence of accessibility, usability, and richness of the CMS, coupled with learning motivation on the learning success as perceived by students with sensory limitations. The

model is tested by surveying university students with sensory limitations about their views on the course management system used. The results suggest that accessibility and usability of a CMS have a positive influence on the learning success as perceived by students with sensory limitations.

Chapter XV, "Supporting Argumentative Collaboration in Communities of Practice: The CoPe_it! approach" by Nikos Karacapilidis, University of Patras and Research Academic Computer Technology Institute (Greece), and Manolis Tzagarakis, Research Academic Computer Technology Institute (Greece), argues that a varying level of formality needs to be offered in systems supporting argumentative collaboration. The chapter accordingly proposes an incremental formalization approach that has been adopted in the development of CoPe_it!, a Web-based tool that complies with collaborative principles and practices, and provides members of communities engaged in argumentative discussions and decision making processes with the appropriate means to collaborate towards the solution of diverse issues.

Chapter XVI, "Personalization Services for Online Collaboration and Learning" by Christina Evangelou, Informatics and Telematics Institute (Greece), Manolis Tzagarakis, Research Academic Computer Technology Institute (Greece), Nikos Karousos, Research Academic Computer Technology Institute (Greece), George Gkotsis, Research Academic Computer Technology Institute (Greece), and Dora Nousia, Research Academic Computer Technology Institute (Greece), focuses on the integration of personalization services to collaboration support tools, the aim being to advance the development of learning skills, the interaction with other actors, and the growth of the learners' autonomy and self-direction. This chapter presents a framework of personalization services that has been developed to address the requirements for efficient and effective collaboration between online communities' members that can act as catalysts for individual and community learning.

Chapter XVII, "Computer-Aided Personalised System of Instruction for Teaching Mathematics in an Online Learning Environment" by Willem-Paul Brinkman, Delft University of Technology (The Netherlands), Andrew Rae, Brunel University (United Kingdom), and Yogesh Kumar Dwivedi, Swansea University (United Kingdom), presents a case study of a disrete university mathematics course with over 170 students who had access to an online learning environment that included a variety of online tools, such as videos, self-tests, discussion boards, and lecture notes. Students' learning is initially examined over a period of two years, and compared with that in a more traditionally taught part of the course. To examine students' behaviour, learning strategies, attitudes ,and performance, both qualitative and quantitative techniques were used as a mixed methodology approach, including in-depth interviews, controlled laboratory observations, surveys, diary studies, classroom observations, recording online usage behaviour, and learning assessments.

Chapter XVIII, "Social Software for Sustaining Interaction, Collaboration, and Learning in Communities of Practice" by Sandy El Helou, Denis Gillet, Christophe Salzmann, and Yassin Rekik, École Polytechnique Fédérale de Lausanne – EPFL (Switzerland), presents a Web 2.0 social software, called eLogbook, which has been designed for sustaining interaction, collaboration, and learning in online communities. This chapter describes the 3A model on which eLogbook is based as well as the main services that the latter provides. The proposed social software has several innovative features that distinguish it from other classical online collaboration solutions. Among others, it offers a high-level of flexibility and adaptability so that it can fulfill the requirements of various Communities of Practice. It provides community members with ubiquitous access and awareness through its different interfaces, and strengthens usability and acceptability thanks to its personalization and contextualization mechanisms.

Chapter XIX, "Multimedia Authoring for Communities of Teachers" by Agnès Guerraz, INRIA Rhône-Alpes (France), Cécile Roisin, INRIA Rhône-Alpes (France), Jan Mikáč, INRIA Rhône-Alpes (France), and Romain Deltour, INRIA Rhône-Alpes (France), proposes a multimedia authoring model and a generic platform on which specific community-oriented authoring tools can be realized. The main

idea is to provide template-based authoring tools, while keeping rich composition capabilities and smooth adaptability. The proposed model is based on a component-oriented approach integrating logical, time and spatial structures, while templates are defined as constraints on these structures.

The proper exploitation of Web-based technologies towards building responsive environments that motivate, engage, and inspire learners, and which are embedded in the business processes and human resources management systems of organizations, is highly critical. Accordingly, the research field of technology-enhanced learning receives a continuously increasing attention. "Solutions and Innovations in Web-Based Technologies for Augmented Learning: Improved Platforms, Tools and Applications**"** provides cutting-edge research on a series of related topics and discusses its implications in the modern era's broad learning concept. Addressing diverse conceptual, social, and technical issues, this book provides professionals, researchers, and practitioners in the field with up-to-date research in developing innovative and more effective learning systems by using Web-based technologies.

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