Preface

EMERGING TECHNOLOGIES IN DISTANCE LEARNING

It is an established fact that for a successful distance education program we require technologies that provide increased interactivity between the learners and teachers. It is just about a decade since the understanding of technology for distance education were meant to include post, telephone, fax and limited use of the Internet. The rapid growth in computers, telecommunication technologies and capabilities, and change in nature of the information age has significantly changed the definition and technology requirements in distance education. Technologies considered as advanced for distance education in the recent past are abandoned and new technologies are demanded today. The advances in technology have caused paradigm shifts in distance education starting from correspondence courses, teleconferencing over speaker phones, teleconferencing via modem, transporting still pictures along with interactive audio, to the latest technology of two-way, full audio, full video communication. Current technological advances have generated a great deal of excitement and hope to overcome the walls and boundaries, the barriers of real time interactivity in distance learning education. Today development of learning modules that include elements such as video transmission, e-mail, the Internet, and the World Wide Web supported by multimedia are common. The goal is to minimize or overcome the limits of separation between the learners, educators and facilitators by time and distance.

This book focuses chapters on different research, design and implementation aspects of technologies and methods with specific focus on distance education. These include:

- Development of integrated e-learning environment based on interactive multimedia services with proactive QoS; allowing development of end-to-end QoS-aware multimedia conferences, coordinating resources from network, end-system processing equipment and applications. One proposed system integrates public domain multicast applications for synchronous media communication, being supervised by a middleware-based QoS management framework intending to preserve the QoS of critical parameters for e-learning session's specificity.
- Studies to demonstrate how one of the most effective training methods, the behavior modeling (BM) approach, that is, teaching through demonstration, applied in live instruction will carry over to three different online environments: F2F, online synchronous and online asynchronous classes.
- Assessment and comparison between the efficacy of case method teaching in face-to-face and online asynchronous learning (OAL) environments. Four hypotheses are proposed on the correlation between these two delivery modes and studied the learning performance of students.
- Research on “motivation-to-e-learn,” a key component to design technology-supported learning experiences, with focus on quantitative approaches to support learning-centered design by consid-
ering student needs and their immediate and broader contexts to promote effectiveness in order to fully get the expected benefits of e-learning challenges.

- New approach for explaining algorithms that aims to overcome various pedagogical limitations of the current visualization systems through design and implementation of Structured Hypermedia Algorithm Explanation (SHALEX) system to explain algorithms at various levels of abstraction.
- Presentation of a collaborative education model that would provide efficient communication services and an open scalable architecture for the uniform publication, management, and dissemination of distributed educational material developed by geographically dispersed educational providers, while maintaining the autonomy of the participating providers.
- Design of an agent-based architectural and conceptual framework for a Personalized Continuous Professional Development Learning Portal (Personalized-CPD) that, by harnessing the abundance of information and e-learning materials on the Web, can be effectively used to serve the diversity of CPD training needs.
- Discussion and development of a keyword-accessible lecture video player to enable students to view past lectures at any time and from anywhere on their PCs.
- Provide understanding of the expectations and behaviors of business aviation pilots towards online learning.
- Introduction of a tool based on a suite of visual languages, which has been specifically conceived to support instructional designers in the definition and creation of learning processes.
- Design and implementation of different Internet-based virtual laboratories, a rapidly growing research area in universities, to facilitate the designing and deployment of the lab-based courses for e-education.
- Implementation of a prototype of a virtual digital signal processing laboratory (VDSPL) by using the IBM Aglet system and Java Native Interface for DSP experimental platforms.
- Research on information retrieval in the context of virtual universities and dealing with the representation, organization, and access to learning objects. The representation and organization of learning objects should provide the learner with an easy access to the learning objects.
- One of the challenges in developing an automated distance learning system, which is to craft the instructional experience so that students acquire the capability to solve problems not explicitly taught or encountered in the system itself.
- Introduction to a series of formative evaluations to assess and enhance the instructional effectiveness of an automated and individualized distance learning system that is intended to assist information systems students in beginning their study of Java™.
- Investigation of the problem of personalization in Web-based learning environments.
- Development and evaluation of a WWW conference system in order to realize a remote mental health care education by providing communication between the mental health care specialists and patients and their families by using the live video on WWW browser, point-to-point communication, point-to-multipoint communication and multipoint-to-multipoint communication.
- Development of a kind of approach supporting a task-oriented mobile distance learning paradigm—Web-based seamless migration, which has the capability that task for mobile distance learning (MDL) dynamically follows the learner from place to place and machine to machine without learner’s awareness or intervention by active service, which may be achieved by architecture of component smart platform and agent-based migrating mechanism.
- A design framework recommendation for constructing digital rights management (DRM) that enables learning objects in legal usage. The central theme of this framework is that any design of a
DRM must have theories as foundations to make the maintenance, extension, or inter-operability easy.

The chapters in this book reinforce the fact that the digital revolution, powered by the engines of information and communication technologies, has fundamentally changed the way people think, behave, communicate, work and earn their living. It has restructured the means by which the world conducts economic and business activities and runs governments. It has formed new ways to create knowledge, educate people and disseminate information.