Preface

Information technology (IT) is of increasing importance in the world today. Information and communications technologies are pervading all aspects of life at work, school, and home. Businesses depend upon technology, and the growth in IT and the Internet has changed the face of commerce, allowing organizations to provide services that would not otherwise be possible and delivering major productivity gains in many industries. IT has also changed the way we learn, offering vast improvements in flexibility of learning, changing the face not only of distance education but also the way in which courses are delivered on campus and the way in which student research is carried out. Even home life has changed. Many people are now able to work from home because of telecommuting. People use personal organizers and applications such as accounting packages to organize their home life. Technology has also provided new kinds of entertainment and changed forever the way many people communicate on a day-to-day basis.

In order to succeed in our complex world, a wide variety of people require IT education. Students come from different walks of life and are at different stages in their education. They require a vast array of different kinds of IT knowledge and skills. Some wish only to be able to use existing technology effectively; some will become the developers of new information and communications technologies. It is the task of the IT educator to meet this great demand for knowledge and skill across the enormous range of potential participants.

There are many pressures on IT educators. Technology changes rapidly, and educators must keep up; academic institutions face financial pressures that drive increases in class sizes or demands to reduce class contact time; and the wide range of student backgrounds and motivations creates complexities. However, there are also many opportunities to improve teaching and learning by utilizing advances in technology and in the understanding of the learning process. Information accessibility has never been greater, enabling students to study "any time" and "any place." This makes it possible for new groups of students to participate.

This book brings together a number of chapters that address opportunities to improve the teaching and learning of IT in its various forms. The authors are from a wide variety of organizational and cultural backgrounds and are all experts in the fields they discuss. The chapters introduce theoretical developments in IT education, report on successful innovations in teaching and learning, and raise issues that require consideration. The topics covered include IT degree curriculum issues, facilitating the IT literacy of all graduates, and using IT in teaching and learning. The book contains many ideas and suggestions that will be invaluable to all those involved in IT education and the use of IT in education. It is organized into 33 chapters in three sections. The first section relates to IT degree issues, the second section covers issues associated with IT literacy, and the third section is devoted to the use of IT to support teaching and learning. A brief description of each chapter follows.

In Chapter I, entitled, "Belief, Inquiry, Argument and Reflection as Significant Issues in Learning about Information Systems Development Methodologies," by David A. Banks of the University of South Australia (Australia), the development of a Masters-level course on information systems (IS) development methodologies is examined. The course was conceived as taking a "reality as a social construct" view of the world in order to encourage students to challenge assumptions and, hence, enhance their understanding of the subject area. The chapter reflects on problems that were experienced when offering the course and outlines a number of approaches that have been adopted to help students deal with interpretivist approaches to learning.

In Chapter II, entitled, "Making the Case for Case-Based Learning in Computer Information Systems," by Morgan M. Jennings, Charles H. Mawhinney, and Janos Fustos of Metropolitan State College of Denver (Colorado, USA), the results of a study that compared the perceptions of current students about IS careers with those of students in a 1989 study are reported. The authors found that IS students still perceive IS careers as lacking in interaction, and the chapter reports on some programs available in high schools to interest students in IS careers. The chapter also discusses problem-based learning as a means to address perceptions of IS careers.

In Chapter III, entitled, "Introducing Information Systems Students to Research with a Structured Group Project," by Tanya McGill of Murdoch University (Australia), an approach to getting IS research students started is reported. The approach involves beginning research students undertaking a structured group research project in which the instructor is an active participant. This group project provides a gentle, supportive introduction to IS research and benefits students by ensuring that they have participated in a complete research project before they have to assume complete responsibility for their first large individual project.

In Chapter IV, entitled, "Making Way for Java in an Information Technology Masters Program," by Wendy Lucas of Bentley College (Massachusetts, USA), the introduction of Java as a first programming language in an IT Masters program is described. Decisions such as when to introduce object-oriented concepts, which integrated development environment to use, and how to support students with little prior background, are explored.

In Chapter V, entitled, "Analysis of Learner Performance on a Tutoring System for Java," by Henry H. Emurian and Jingli Wang of the University of Maryland Baltimore County (USA) and Ashley G. Durham of the Centers for Medicare & Medicaid Services (Maryland, USA), a teaching methodology based on programmed instruction that provides a series of interactive and cumulative learning experiences to students learning to write a simple Java Applet is presented. This objective is achieved within the context of a Web-based tutoring system.

In Chapter VI, entitled, "Supporting Creativity in Software Development: An Application in IT Education," by Aybüke Aurum, Meliha Handzic, and Adrian Gardiner of The University of New South Wales (Australia), the potential of an individual creativity enhancing technique called SoloBrainstorming to improve the level of creativity of IT students in performing requirements determination is examined. The chapter also offers advice about incorporating creativity enhancing techniques into the IT curriculum.

In Chapter VII, entitled, "Training in Remote Database Server Administration," by Ludwig Slusky and Parviz Partow-Navid of California State University, Los Angeles (California, USA), the establishment of a remote access Unix laboratory to support new server-focused courses in IT degrees is described.

In Chapter VIII, entitled, "Conceiving Architectural Aspects for Quality Software Education through the Constructivist Perspective," by Kam Hou Vat of the University of Macau (Macau), an initiative to incorporate the practice of quality software education into a software engineering curriculum is discussed. This initiative combines action learning with problem-based learning and allows students to acquire collaborative experience in the practice of architected applications development.

In Chapter IX, entitled, "The TCP/IP Game," by Norman Pendegraft of the University of Idaho (USA), a simulation game used to help students understand the operation of TCP/IP is described. In the game, students play various layers of TCP/IP on several machines and collaborate to transmit a message from one application to another.

In Chapter X, entitled, "Framing Leadership Issues for System Developers," by Gayla Jo Slauson and Chad Grabow of Mesa State College (Colorado, USA), a brief introduction to the frame theory of leadership is provided, and how this theory relates to IS is discussed. The authors propose that students in IS degree programs need to be made aware of the leadership potential of the systems through which members of organizations communicate.

In Chapter XI, entitled, "S3: Senior Surf School — A Special Graduate Information Systems Course," by Georg Disterer of the University of Applied Sciences and Arts (Germany), an IS course where students design, organize, and run a training session designed to introduce users (in this case, elderly people) to the Internet is described. In this course, a realistic simulation of the future tasks and responsibilities many graduates will encounter, given the importance of end-user training, is provided.

In Chapter XII, entitled, "How Do IT Students Stay Up to Date with Employers' Skill Requirements?" by Tanya McGill and Michael Dixon of Murdoch University (Australia), a research study that investigated the channels of information that telecommunications management and electronic commerce students use to keep up to date with employers' IT skill requirements is reported. The results suggest that students are diligent in their efforts to keep up to date, and that they favor easily accessible channels of information, such as newspapers and Internet sources. The chapter also discusses the role of instructors in helping students to gain information about skill requirements.

In Chapter XIII, entitled, "Education for a Technology-Based Profession: Softening the Information Systems Curriculum," by Rodney Turner of Victoria University of Technology (Australia) and Glenn Lowry of United Arab Emirates University (UAE), findings from an investigation into the conceptual, academic, and "soft" skills that IT practitioners regard as important in new graduates are reported. Also discussed are IS curriculum reform issues arising from the results and recommendations for addressing barriers to curriculum reform.

In Chapter XIV, entitled, "Tracking Through Information Technology Education," by Erick Slazinski and Susan K. Lisack of Purdue University (Indiana, USA), the trend toward specialization in the IT field is discussed, and the creation of a database track within an IS or IT degree program is described so that students can choose to focus on this specialty area.

In Chapter XV, entitled, "Designing e-Business and e-Commerce Courses to Meet Industry Needs," by Anthony D. Stiller of the University of the Sunshine Coast (Australia), the importance of e-commerce development consultants to small-to-medium enterprises is highlighted, and then the design and development of courses that will better prepare graduates to have a balanced mix of e-business, e-commerce, communication, and leadership skills that will equip them to work as consultants for small-to-medium enterprises is discussed.

In Chapter XVI, entitled, "Adding Reality to Team Projects: E-Business Consulting for Small Business Entities," by Sharon W. Tabor of Boise State University (Idaho, USA), the use of team projects to develop prototype sites for actual businesses is described. In addi-

tion to concepts, strategies, and technical skills, students learn transferable consulting skills and improve their teamwork skills.

In Chapter XVII, entitled, "Metacognition in Information Systems Education," by Steve Benson of Edith Cowan University (Australia), the role of metacognitive education in IS teaching is considered, and the introduction of a metacognitive training program to support student learning at an Australian university is described.

In Chapter XVIII, entitled, "Required Software Proficiency in General Education and Business Courses," by Linda Lynam of Central Missouri State University (USA), the implementation of a productivity software proficiency requirement at a Midwestern state university is described. The author found that even students who had received little preparation for self-motivated learning were able to reach the required levels of proficiency.

In Chapter XIX, entitled, "Technology Literacy Issues for Freshmen Education Majors in a Leading Teacher Program," by David D. Carbonara of Duquesne University (Pennsylvania, USA), IT literacy issues in preservice teacher education are discussed, and a leading teacher program that addresses these issues in preparing preservice teachers as technology leaders is described.

In Chapter XX, entitled, "Assessing Computer Literacy: A Comparison of Self-Assessment and Actual Skills," by George Easton and Annette Easton of San Diego State University (California, USA), a study designed to assess university business students' actual computer skills and to measure the difference between students' self-assessment of these skills and an actual assessment of their skills is reported. The authors found that there was a consistent, inflated self-perception of computer literacy. Students were found to be most accurate in self-assessing their Windows capabilities and least accurate with PowerPoint and Excel.

In Chapter XXI, entitled, "Using Modulization Approach to Design Instructional Systems for Computer Literacy Courses," by Kuan C. Chen of Purdue University, Calumet (Indiana, USA), the use of modulization approaches in designing instructional systems are discussed. The chapter also presents a case study of the design of a computer literacy course. This approach to instructional design allows institutions to better serve students with a wide variety of backgrounds.

In Chapter XXII, entitled, "Information Technologies in Educational Organizations: An Innovative Collaborative Course Development, Delivery, and Evaluation," by Pamela Lipe Revercomb and Ruth V. Small of Syracuse University (New York, USA), the collaborative design, development, implementation, and evaluation of an interdisciplinary course about the selection, management, and use of IT for teaching and learning are described. Recommendations are also included for future implementations, including distance delivery.

In Chapter XXIII, entitled, "Developing Graduate Qualities," by Ann Monday and Sandra Barker of the University of South Australia (Australia), a case-study and role-play approach to embedding required graduate qualities in an undergraduate business course is explored. The approach adopted facilitates effective problem solving, working collaboratively, effective communication and lifelong learning, as well as the ability to operate effectively on a body of knowledge. However, the authors note that the approach has a high overhead in terms of staff time.

In Chapter XXIV, entitled, "Real Live Cases in Training Management of Information Resources During the Transition to a Market Economy," by Dimitar Christozov of the American University in Bulgaria (Bulgaria), the use of real live cases based on the experiences of Masters' students in improving the learning outcomes of students taking an information resources management course is discussed. This approach is compared with the use of

cases drawn from textbooks. The author concludes that although the use of live cases is demanding, it is beneficial to students.

In Chapter XXV, entitled, "Business Students as End-User Developers: Simulating "Real-Life" Situations through Case Study Approach," by Sandra Barker of the University of South Australia (Australia), the use of case studies to assist business students in understanding the complexities of database development and to facilitate end-user development of databases is explored.

In Chapter XXVI, entitled, "E-Business Education for Everyone: Developing and Implementing Breakthrough Strategies (Or How Can IT Practitioners and Educators Make Computer Morons Surf and Steer on E-Business Space)," by Rumel V. Atienza of De La Salle University (Philippines), the issue of the preparedness of the workforce in the Philippines to face the challenge of e-business is addressed. The chapter investigates strategies that can be implemented to help prepare for e-business and provides a preliminary assessment of their effectiveness.

In Chapter XXVII, entitled, "Information Management in Public Sector Agencies: A Context-Sensitive Conceptual Framework of CIO Competence," by Maurice W. Green of the University of Washington (USA), insight into the problems, challenges, and requisite competencies for public-sector CIOs is provided, and a multidimensional, interdisciplinary conceptual framework of CIO competence is presented. The discussion should be valuable to academicians developing IT management curricula and to practitioners engaged in CIO search and development activities.

In Chapter XXVIII, entitled, "Empirical Study of Students' Perceptions of Online Courses," by Judith C. Simon, Lloyd D. Brooks, and Ronald B. Wilkes of the University of Memphis (Tennessee, USA), a study that determined potential students' perceptions of online programs is described, and these perceptions are then compared with the potential students' perceptions of on-campus programs. The issues that were found to be most important to students in course delivery are discussed, and student beliefs as to whether these issues are more likely to be addressed in online or on-campus course delivery are considered.

In Chapter XXIX, entitled, "Community Informatics — Enabling Emancipatory Learning," by Wal Taylor, John Dekkers, and Stewart Marshall of Central Queensland University (Australia), a philosophical stance and framework for online teaching that emphasizes the importance of placing the student at the center of the learning process is articulated. This approach integrates information and communication technology (ICT) with emerging trends in distance education and lifelong learning, and the authors believe it can help assist local communities in benefiting from a wider interpretation of knowledge available through online distance education.

In Chapter XXX, entitled, "An Examination of ICT Planning Maturity in Schools: A Stage Theory Perspective," by Julie Mackey of Christchurch College of Education (New Zealand) and Annette Mills of the University of Canterbury (New Zealand), ICT planning in schools is examined, and based on case studies conducted in eight primary schools, a four-stage model of the evolution of ICT planning maturity in schools is proposed. The model provides insight into the nature of ICT planning in schools and into the factors that contribute to planning maturity.

In Chapter XXXI, entitled, "On-line Case Discussion: A Methodology," by Henri Isaac of Paris Dauphine University (France), an approach to conducting online case discussion is presented and evaluated. The approach has been trialed in an executive MBA program, and the results of the evaluation are positive.

In Chapter XXXII, entitled, "A Comparison Between the Use of IT in Business and Education: Applications of the Internet to Tertiary Education," by Stephen Burgess and Paul Darbyshire of Victoria University (Australia), the similarities between the use of IT in business and education are discussed, and the categorization of aspects of Web use in education using standard business categories relating to savings and quality is explored. Also reported are the results of a study of academics conducted to survey the perceptions of benefits gained from supplementing teaching with Web-based services.

In Chapter XXXIII, entitled, "Virtual Government: Online-Services within the Public Sector" by Birgit J. Oberer of the University of Klagenfurt (Austria), an overview of electronic government is given. Selected current international electronic government incentives are reviewed, methods for analyzing governmental strategies are introduced, and guidelines for implementing electronic government are presented.

Keeping up to date with issues and developments in IT education is essential for all those who wish to capitalize upon the potential benefits available from IT and to learn from the experience and research of others. The authors of the chapters in this book share their insights into a wide range of topical issues. They address theoretical developments, report on successful experiences with innovations in teaching and learning, and raise issues that require further consideration and research.

This book provides many ideas and suggestions that will be of value to researchers and practitioners. The chapters in which IT degree curriculum issues are discussed will be invaluable to those involved in planning, designing, and teaching a wide range of ICT-related courses and degrees. Those that explore the issues associated with IT literacy for non-IT majors will be useful to those involved in helping to ensure that the broader student population is able to take advantage of the power of IT. Finally, the chapters on the use of IT to support teaching and learning provide practical guidelines for all educators today. Thus, academics, researchers, and practitioners alike, whether specialists in IT or from any other discipline who utilize IT to support their teaching, will all benefit greatly from the ideas and approaches explored in this book in confronting the challenges presented in IT education today.

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