

# Preface

The rapidly changing needs of the current and future workforce are creating an enormous challenge for higher education around the world. As technology and the corresponding knowledge and skill requirements of the workforce change, the whole notion of higher education is evolving. The need for education and training is growing and it is becoming a lifelong activity.

To meet the increasing demand for education and training, higher education institutions are increasingly turning to e-learning, which is seen as a way of providing convenient and flexible access to education and training, while avoiding the cost of building larger physical campus facilities and infrastructure. At the same time, e-learning is seen as a way of improving the quality of teaching and learning.

However, the institutional response to e-learning is far from consistent and, despite the hype, evidence suggests that while it is a growing phenomenon, enrollments in e-learning are still relatively low at most campus-based institutions. In addition, the widely predicted “paradigm shift” in teaching and learning that e-learning was supposed to usher in has, by all accounts, not yet occurred (OECD, 2005).

We believe this should not be seen as a failure of e-learning, but rather viewed as a failure of institutions to respond appropriately. Organizational arrangements, funding, development processes, faculty and learner support, and other policies vary widely from institution to institution. Quality is also variable and often unflattering. Long pages of lecture notes, poorly designed Web sites, lack of interaction, and the inadequate use of the rich resources available on the Internet characterize much of the present world of online e-learning. Significant institutional barriers to the effective implementation of e-learning still exist: infrastructure and funding have been identified as the most important but

skepticism about the pedagogical value of e-learning and faculty development are also key (OECD, 2005).

Of course, not all is bleak. Many institutions have coherent, well-developed e-learning strategies, robust and well-funded organizational structures, and high quality e-learning products ranging from individual modules to fully online e-learning programs. But this is not the norm. The lack of consistency and the concerns about quality stem partly from the novelty of this approach to teaching. The modern Internet, after all, is just over 10 years old and it is only since the turn of the 21<sup>st</sup> Century that most higher education institutions have begun to pay serious attention to e-learning. This novelty, however, means that many people and institutions are using e-learning without a solid understanding of how to plan and develop instruction, of the underlying teaching and learning theories, and of what makes the Internet a unique medium for teaching and learning.

This book aims to address that gap by exposing educators and administrators to some of the key theoretical and practical issues illustrated in real examples from a variety of institutional contexts. Drawing on the experiences of educators from five countries with extensive experience in e-learning as teachers, administrators, researchers, and instructional designers, this book focuses on pedagogy and on planning and integrating technology with face-to-face teaching. The underlying theme is pedagogy before technology. Too often we make technological decisions in education without considering the pedagogical implications. But the book goes beyond the pedagogy and looks at broader institutional and conceptual issues as well as technology and instructional design issues.

## **The Meaning of E-Learning**

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The term e-learning is widely used, but it means different things to different people. To minimize confusion and make the chapters in this book more meaningful we have started from a common understanding of e-learning. We base our conception on the work of Zemsky and Massy (2004) who suggest there are three major categories of e-learning:

1. **E-learning as distance education:** This refers to courses that are delivered entirely, or almost entirely, on the Internet. This is the most common understanding of e-learning, but increasingly, e-learning is not seen as distance education but as any teaching that involves technology, which is the second type of e-learning.

2. **E-learning as electronically mediated learning:** This category includes any teaching or learning that is mediated by technology. Thus, products like computerized test preparation courses that prepare students to take the SAT or GRE; complex, integrated learning packages such as Maple or Mathematica that teach elementary calculus; learning objects that simulate and illustrate various concepts such as chemical reactions, mathematical modeling, social interactions, and musical compositions; and tools like Macromedia's Dreamweaver and Flash that students use to build their own Web sites. Interactive CD-ROMs and the Web sites of book publishers would be part of this category. What all these products and resources have in common is that they involve electronically mediated learning in a digital format that can be used as part of regular on-campus teaching. It is not necessarily distance education.
3. **E-learning as facilitated transactions software:** This category includes the software that is used to organize and manage teaching and learning, learning management systems like the commercial products BlackBoard and WebCT, and open source products like Moodle. These learning management systems link teachers with students, students with each other, and students to resources. Course content, schedules, assignments, and other resources are uploaded to these systems for students to access. In addition, these systems allow for online testing.

When we think of the first two categories, e-learning as distance education and e-learning as electronically mediated learning, we think it is helpful to think of e-learning as fitting into a continuum of delivery modalities. The continuum stretches from fully face-to-face at one end to fully online at the other (Figure 1).

*Figure 1. The e-learning continuum*



As we move from the full face-to-face end of the continuum, more and more technology is used to replace the face-to-face elements. Initially, this has very little impact on how teaching is organized because the technology is used primarily to enhance the face-to-face teaching. But as we move further along the continuum (from left to right) the nature of teaching and how it is organized is affected by the technology.

Somewhere around the middle of the continuum, we have what is called mixed-mode teaching, where significant amounts of the face-to-face element are replaced by technology-mediated teaching. (Note: The terms blended learning and hybrid courses are often used to describe this part of the e-learning continuum.) Fewer class sessions are held as technology is used increasingly to deliver the teaching and to facilitate the learning. Once we reach the right end of the continuum there is no longer any face-to-face teaching. The second to last box on the right represents fully online e-learning in which all teaching is technology mediated.

According to this framework, e-learning is that part of the continuum that begins when technology is used to replace some of the face-to-face teaching to the point on the continuum where it replaces it all. The framework also helps us to understand the relationship between distance education and e-learning. Distance education overlaps with e-learning. Increasingly, distance education is fully online but historically it has used other technologies, and there is still a considerable amount of distance education that would not be considered e-learning. Accordingly, we can have what we call mixed-mode e-learning in which there is a combination of face-to-face and technology-mediated teaching or distance education e-learning in which all teaching and learning is done without teacher and learners never meeting face-to-face. And there can be distance education that uses print and television that would not be considered e-learning (Bullen, 2006).

With this understanding of e-learning in mind, we like to use the metaphor of home renovations to help understand the importance of making appropriate institutional responses to e-learning. When we decide to renovate part of our homes, we understand that we can only go so far. We can add a new room or a sun deck, we can finish the basement, we can even add a new floor to our house, but at some point, the underlying structure becomes unable to handle all the additions. This is the state we have reached with e-learning. Simply adding e-learning to our existing ways of teaching will put undue stress on the underlying structure of traditional education and ultimately leading to collapse. Overworked instructors will not be able to handle the additional requirements of learning how to use the new technology. They will not have the time to deliver their typical three lectures a week and also develop e-learning resources and moderate online discussions. Students will be left struggling between the traditional educational system and the stresses and potentials of new technologies in their classrooms, whatever the delivery choices. Educational institutions will

not be able to afford to continue business as usual and add on the cost of the new technologies. Something has to change.

## **Organization of This Book**

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The chapters in this book present a variety of perspectives on how educational institutions can, or are, making the transition to e-learning, but they share a common theme: Moving to e-learning requires us to radically rethink how are institutions are organized, how we teach, and how we support our learners and our faculty. Each chapter deals, in its own way, with how to ensure that e-learning is implemented effectively so that the end product is pedagogically effective and does not put undue stress on the human, financial, and physical infrastructure of our educational institutions. The book is divided into three sections. The chapters in the first section deal with broader institutional and conceptual issues. In the second section we turn to teaching and learning issues and some of the specific approaches and strategies that can be used to teach in an e-learning environment. The focus of the chapters in the third section is on instructional design and technology issues.

### **Section I: Institutional and Conceptual Issues**

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Marco Adria and Katy Campbell, of the University of Alberta, start the book off with a fascinating essay that argues that we need to be thinking more broadly about e-learning in ways that take us beyond the instrumental and to higher level considerations such as citizenship and nation building. Adria and Campbell suggest e-learning has the potential to be socially transformative because of its power to support diverse cultures, languages, work contexts, learning needs and styles, prior experiences, generations, economic circumstances, social contexts, and geographic location. They argue that the metaphor of an e-learning nation supports the reflective and progressive development of learning communities in which identity is consciously and critically examined.

Margaret Haughey, also with the University of Alberta, moves us to a more practical level in her chapter in which she examines the different ways in which Canadian universities have organized themselves to respond to the challenge of e-learning. She analyzes the organizational responses to the provision of faculty support for e-learning in six large Canadian universities since 1997. A variety of organizational models are examined including centralized, decentralized, integrated, and parallel units. Their advantages and disadvantages are identi-

fied and described and the chapter contains several recommendations for senior administrators involved in e-learning, with a particular focus on issues concerning the goals and culture of the institution, the integration of pedagogical and technological approaches, as well as involvement of faculty and the role of policy.

Next, we move to a different institutional and national context with the first of three chapters that come from the polytechnic sector. Oriel Kelly, from the Manukau Institute of Technology in New Zealand, describes the process that was used to make the transition to e-learning in this large polytechnic. Integral to the process was a matrix that helped faculty to make decisions about the degree of e-learning that was most appropriate. The matrix has guided the transition to e-learning across the entire institute. The chapter discusses the institutional support that was provided for the different levels of e-learning in a way that enabled faculty to retain control over a quality learning experience for their students.

Tony Bates, with Tony Bates Associates, Ltd., brings us back to Canada for the second polytechnic chapter. He provides a timely and interesting examination of how the Southern Alberta Institute of Technology (SAIT) developed a comprehensive strategic plan for e-learning. This is one of the only detailed accounts of how a strategic plan for e-learning has actually been developed and implemented in a particular institution. It is based on his work as the Cisco Chair in E-Learning at SAIT Polytechnic, which ended in 2005. The chapter provides a valuable case study that incorporates planning processes and strategies that could be applied to a wide variety of postsecondary institutions.

In the final chapter dealing with polytechnics, Maggie Beers examines how an institution-wide e-learning initiative was developed and implemented at the British Columbia Institute of Technology. Her chapter focuses on the participatory role faculty played in the first year of the five-year technology-enabled knowledge (TEK) initiative, which is designed to promote educational excellence in learning, teaching, and research through the use of e-learning. She argues that faculty engagement will ultimately determine the success of this e-initiative and, as such, faculty need to be active members in a collaborative process informed by participatory design. This chapter provides a model that can help inform the strategic direction of other institutes implementing similar e-learning initiatives.

The Institutional and Conceptual Issues section concludes with a case study from one of Canada's newest universities, and one of Canada's two laptop universities, the University of Ontario Institute of Technology. Ellen Vogel and Bill Muirhead report on a study that assessed the needs and gaps of nursing faculty in the use of e-learning and attempted to understand the requirements for infusing e-learning into the nursing program.

## **Section II: Learning and Teaching Issues**

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Dirk Morrison, of the University of Saskatchewan, begins Section II with a discussion of new theories, models, and environments for online teaching and learning and as well considers the institutional issues associated with the appropriate use of e-learning technologies. This chapter aims to expand the discussion beyond pragmatic questions regarding how to make the transition from face-to-face teaching to e-learning, to include questions regarding how to fundamentally shift the core guiding pedagogical principles of our institutions of higher education.

Gail Wilson, of the University of Western Sydney, focuses her chapter on strategies used to ensure that faculty is sufficiently skilled to work in the online environment and explores the institution's capability to sustain the integration of the new technologies into learning and teaching practices. She adopts the view that faculty development for the e-learning environment is a change process aimed at providing faculty with new sets of skills, knowledge, and capabilities in this innovative and often different context for learning and teaching.

Cathy Gunn and Mandy Harper, with the University of Auckland, New Zealand, explore how learning theories and approaches to teaching can be applied to e-learning in the context of a growing and increasingly diverse student population. They reflect on the scale of the transformation that has taken place over the years, as well as discuss some of the key challenges faced during the process and issues yet to be addressed as development proceeds.

Richard Schwier and Mary Dykes from the University of Saskatchewan, delve into the world of e-learning communities and consider how implementation strategies used can influence the balance of community and content within the course, leaving us with questions on a myriad of topics including assessment. The authors also describe their reflections on the experiences of instructors in the online environment.

Martha Gabriel, from the University of Prince Edward Island, brings us to the question of faculty preparedness, with respect to effective instruction in e-learning, and offers a number of guidelines for new instructors to consider when engaging in the initial stages of course design. Her work will give instructors an opportunity to review their personal teaching styles and to explore teaching methods and pedagogy appropriate to their teaching styles that are effective in e-learning environments. She includes an overview of key categories of effective activities effective in e-learning environments as well as a synthesis of e-learner needs and expectations.

Dianne Conrad, from Athabasca University, continues this discussion of teaching online with her contribution. Her chapter's central argument focuses on Gunawardena's (1992) "letting go"—the movement from teacher-centered to learner-centered pedagogy as the prime focus in moving to online teaching.



The examples and references that illustrate this chapter's premise will resonate most clearly with those who are teaching in formal postsecondary environments. Using Collins and Berge's (1996) designation of four cornerstone functions for teaching online as a starting point, Conrad argues for reconceptualizing online instruction so connection, community, and collaboration are equally valued, along with the traditional cognitive stronghold, content.

Helen Wozniak, with the University of Sydney, Australia, along with the work of Karen Belfer, the British Columbia Institute of Technology, and Tannis Morgan from The University of British Columbia, investigate differing aspects of e-learning communication, with Wozniak exploring effective interaction strategies in asynchronous discussions and Belfer and Morgan proposing a framework for choosing communication activities for e-learning environments.

Wozniak's chapter leads the reader through an action research-based cycle of improvements she made when developing orientation activities that enabled learners to achieve knowledge construction by participating in asynchronous discussions. The improvements in both the design and delivery of the learning program draw heavily on research evidence describing interaction in online discussions. This combined with her research provides practical suggestions to assist readers to develop strategies for learner support in their own context.

Belfer and Morgan present a framework for planning online discussion activities according to the level of structure and potential dialogue. This framework serves as a tool for making decisions about how to give students more or less autonomy, how a series of course activities can be scaffolded, and the amount of structure or instructor facilitation that is needed. The framework they have developed uses transactional distance theory as a construct and the variables as dimensions to represent different instructional strategies.

This section ends with Rick Kenny's work on problem-based learning as a pedagogical approach for e-learning. PBL is a well-established educational strategy in conventional teaching environments in which complex, ill-structured problems serve as the context and the stimulus for learning. It contrasts with more traditional subject-based approaches where students are first taught a body of knowledge and then may have an opportunity to apply what they have learned to sample problems. Kenny provides a case study of how PBL was implemented in an online e-learning course and provides some recommendations for its effective use in e-learning environments.



## Section III: Instructional Design and Technology Issues

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Luca Botturi, Lorenzo Cantoni, Benedetto Lepori, and Stefano Tardini with the University of Lugano in Switzerland, open this section with their chapter, *Fast Prototyping Development as Communication Catalyst*. They propose a renewed perspective on a known project management model, fast prototyping, which was adapted for the specific issues of e-learning development. Based on extensive experience with large e-learning projects, they argue that this model has a positive impact on e-learning project team communication, and that it provides a good basis for effective management of the design and development process, with specific stress on human-factor management.

From Spain, Albert Sangrà and Lourdes Guàrdia of the Open University of Catalonia and Mercedes González-Sanmamed of the University of Coruña suggest that faculties often try to extend their face-to-face activities to a technological environment without taking into account how the educational context has changed within the environment of a new delivery system. This chapter focuses on the need for redesigning courses and for developing an appropriate educational or instructional model adapted to that new context.

In *Cognitive Tools for Self-Regulated e-Learning*, Tracey Leacock and John Nesbit at Simon Fraser University explore a software application designed to help students take control of their own learning and become better self-regulators. They begin by providing a brief description of self-regulated learning (SRL) and introduce gStudy, a set of cognitive tools developed at Simon Fraser University to support SRL. Their discussion of gStudy includes a case study showing how the application has been used in one undergraduate educational psychology course. Throughout, they look at gStudy both as a practical tool that educators can use in their courses to help students, and as a research tool that researchers can use to learn more about the theories underlying SRL and their practical applications. They conclude by revisiting the importance of SRL and applications such as gStudy in the context of institutional transitions to e-learning.

Elizabeth Murphy of Memorial University of Newfoundland and Thérèse Laferrière of Laval University consider some of the issues related to the adoption of online synchronous communication tools. Their chapter also proposes strategies to help deal with these issues. Two contrasting contexts of the use of online synchronous tools are described.

Adnan Qayyum, with Concordia University, and Brad Eastman, with the University of British Columbia, end the section with their chapter, *Knowledge is PowerPoint: Slideware in E-learning*. They begin by reviewing literature on slideware in e-learning, which includes reviewing research on slideware use

and the passionate debate, currently in the Academy, on the cognitive style of PowerPoint. They analyze this debate in the context of educational technology research on media attributes and its influence on learning. They suggest instructional design strategies for using slideware effectively in synchronous and asynchronous e-learning and discuss the uneasy relationship between slideware and learning management systems (LMS). They conclude by advocating that administrators initiate research on slideware use in their institutions to inform decisions about what type of LMS, if any, they really need for e-learning.

The 20 chapters in this manuscript provide readers with diverse perspectives on some of the fundamental organizational, pedagogical, and technological issues facing educators as institutions make the transition to e-learning. These are the perspectives of practitioners and scholars from around the world, in conventional universities, open universities, and polytechnics. They are perspectives that are based on experience, but they are also grounded in theory and research, and we believe each of the chapters provides readers with valuable and practical insights into the key issues facing higher education as it confronts the challenge of making the transition to e-learning.

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