Preface

Dr. Badrul Khan’s Framework for e-Learning is the organizing theme that runs through the chapters in this book. The Framework was developed in response to questions regarding the necessary conditions to create a meaningful e-learning environment and experience for all stakeholders. This preface will present an overview of the development of this influential framework and a short introduction to the chapters.

The code for the World Wide Web was released in 1992 and, very slowly, the Web came into being. Servers were set up and the Web, in its early years, was just used as an extension of early systems to deliver documents and files. One of the first web-supported university courses was a Distance Education course taught by Dr. Michael G. Moore at The Pennsylvania State University in Fall, 1994 to students in Finland, Estonia, Mexico, and the US. The first North American conference devoted to educational uses of the World Wide Web was NAWeb ‘95 in Fredericton, New Brunswick, Canada, followed by the NAUweb conferences at Northern Arizona University in 1996, 1997, and 1998. The first book published on Web-based Instruction appeared in 1997 and its editor, Dr. Badrul Huda Khan, made the keynote presentation at NAUweb ‘97.

After Web-Based Instruction was published in 1997, Dr. Khan received many inquiries about what exactly made for meaningful web-based learning, as this topic was still very new on the academic scene. Ever since then, Dr. Khan has been researching the answer to the question: “What does it take to provide meaningful online e-learning environments for learners, worldwide?”

It was obvious to Dr. Khan very early on that web-based instruction and learning doesn’t exist in a vacuum; it is deeply embedded in a rich context that includes institutions, technology, teachers, trainers, and learners. After an extensive literature review and talking with hundreds of interested administrators, teachers, and learners, who contributed to his edited books, took his classes, and attended his workshops and conferences presentations, he developed A Framework for Web-based Learning. This was first presented at Utah State University in 1997. He and his students then refined the framework by using it as part of their coursework to review existing web-based instruction and training courses.

The Framework clustered the critical factors into eight dimensions and created an octagonal diagram that was initially called A Framework for Web-Based Learning and is now known as A Framework for e-Learning (as described in more detail in Chapter 1). The eight dimensions are:

- Pedagogical, Ethical, and Evaluation,
- Technological and Interface design,
- Institutional, management and resources support.
While the title of each dimension indicates a ‘main theme,’ the dimensions and their constituent factors are actually interrelated and interconnected, like a vast web to create the context in which e-learning exists. The factors are expressed as a set of interrelated questions to be asked to ensure full coverage of the dimension. Dr Khan determined that in the design, development, and evaluation of web-based teaching and learning, the dimensions and their factors must be thoroughly addressed and balanced in order for the whole of a web-based (then) and, now, any e-learning enterprise to function to the benefit of all stakeholders.

The Web-based Framework was first used by George Washington University graduate students (mostly professionals from government agencies, corporations and educational settings) in 2004. Students used the Framework in a ground-breaking review of institution-wide online programs at six higher education institutions in the U.S. and Canada, including: Regis University, Tallahassee Community College, University of Illinois-Springfield, University of Alaska, Illinois Online Network, British Columbia Open University.

The results of these program evaluations were shared with the contact persons in each institution. Participating institutions received reviews of pedagogical, technological, interface design, evaluation, management, resource support, ethical, and institutional aspects of their online programs. Institutions shared their views on using the Framework, noting they were better able to identify areas where they had strengths and weaknesses – helping them to better appropriate resources and develop future budgets. For example, one participating institution’s online program did very well in the pedagogical issues, but poorly in ethical issues. By using the Framework, students advised: “Since the pedagogical design of e-learning is satisfactory, there is no need to either replace the existing instructional designer or hire new one. Since the plagiarism and intellectual property rights issues were not adequately addressed, assistance from individuals with expertise in legal and copyright issues should be considered in [the] future.”

The web-based learning framework was published in 2001 as Chapter 8 in Dr. Khan’s next edited book Web-based Training (Khan, 2001). Since that time, his framework has been expanded to address blended learning, e-learning, mobile learning, learning in virtual worlds, and, most recently, MOOCs (Corbeil, Corbeil, & Khan, 2016).

The framework is both versatile and comprehensive and has the potential to be useful for the following stakeholders:

1. Instructors can use the framework as a resource in their teaching and training.
2. Instructors and support staff can use the framework to plan, design, evaluate, and implement e-learning.
3. Administrators can use them to organize resources to support e-learning.
4. Interface designers for large fixed and small mobile screens.
5. Administrators at local, regional, and national levels to develop strategic plans for e-learning initiatives.
7. Providers of e-learning schools to understand the level of services the learners (or consumers) expect.
8. Accrediting agencies to review the quality of instruction and support services.
9. Evaluators at any level who want to be sure that their evaluations are comprehensive and complete.
In subsequent publications, the framework has been elaborated into checklists (Khan 2005a, 2005b) to ensure that each factor in each dimension is addressed, even if it is only to check it off with a (Does Not Apply). The framework does not provide a scoring rubric because that is not the point of its use. The framework constantly reminds its users that all dimensions of the e-learning enterprise are interrelated and interconnected and all must be addressed.

This current book seeks to provide readers with a broad understanding of the use of the e-learning framework in open and distributed learning environments and the many dimensions that directly influence their effectiveness as seen through the lens of the framework. The chapters explore the framework’s dimensions: digital pedagogy, administrative models, technological advancements, user-interface design, and usability and many address the issues that have arisen around the use of MOOCs in their various flavors. Such courses are still in their infancy, and the body of research documenting their effectiveness is still small. In order to better approach the design, development, implementation, and evaluation of MOOCs, research using the e-learning framework for evaluation is presented to aid in the better utilization of the resources offered by this new era of digital learning technology.

This is an edited book with many internationally-based authors, so the insights presented reflect both richness and diversity. The contributors offer a variety of points of view, presented through the lens of different versions of the e-learning framework, and these opinions may differ from one another on the same issues. Some of the contributors have explicitly used various versions of the framework; some have not. This is not a cook-book; each reader must take what is here and adapt it to their own situations; the variety in the chapters gives some indication of the scope and flexibility possible.

The book begins with an introductory chapter by Dr. Khan and the subsequent chapters are arranged in the following order:

1. Chapters 1-8 address the Educational Dimensions: Pedagogical, Ethical, and Evaluation.
2. Chapters 9-11 address the Technology Dimensions: Technological and Interface design.
3. Chapters 12-15 address the Management Dimensions: Institutional, Management and Resources support.

INTRODUCTION: A GLOBAL FRAMEWORK FOR E-LEARNING

This chapter introduces and defines the concept of e-learning and open and distributed learning environments. The distinction between traditional instruction and e-learning is described, followed by a discussion of e-learning system features and the particular case of learner-focused e-learning systems, and what is involved in creating ‘meaningful’ e-learning. The Global Framework for e-learning is introduced, with its Dimensions: Institutional, Management, Technological, Pedagogical, Ethical, Interface Design, Resource support and Evaluation, its Factors and Issues. The Dimensions are described individually, then the factors are listed, followed by the issues/questions generated for those factors. The e-learning feature “ease of use” is reviewed using the eight dimensions for one of the stakeholder groups: “students”. The Framework can also be used for evaluation and can be applied to other learning situations, including MOOCs and mobile learning.
CHAPTER 1: DESIGNING MEANINGFUL LEARNING ENVIRONMENTS IN A WORK-INTEGRATED LEARNING COURSE USING A DOCC DESIGN

As Higher Education increasingly moves towards a plethora of blended and fully online learning, questions are raised around the space and place of Work-Integrated Learning (WIL, also known as practicums, field placements, “pre-service teaching”, etc.) This chapter reports on one Australian institution’s efforts to design and deliver a WIL course in a Teacher Education program adopting an open and distributed framework. The redesigned course, Orientation to Teaching, was a first year course in a Bachelor of Education (Primary) program at RMIT University, Melbourne, Australia. The redesign of the course was underpinned by a Distributed Open Collaborative Course (DOCC) design – informed by MOOC principals and, as the workplace also became the site of learning, the theory of effective Work-Integrated Learning curriculum also informed the design. This chapter examines the complexity of DOCC design in Work-Integrated Learning contexts and uses Khan’s eight dimensions to frame the discussion and to inform the design of the distributed course involving over 200 students at different school locations.

CHAPTER 2: INVESTIGATING STUDENTS’ INTERACTIONS WITH DISCUSSION FORUMS, FACEBOOK, AND TWITTER IN A MOOC AND THEIR PERCEPTIONS OF THESE TOOLS

Given that MOOCs are a relatively new format for online instruction, evidence-based research is needed to understand the role of MOOCs in the changing educational landscape, especially how students use the communication tools provided in MOOCs. This study investigated how students interacted with the discussion forum in a MOOC, and how they utilized Facebook and Twitter as an additional external space associated with this MOOC. Less than half the students participated in any of the discussions. Khan’s Framework dimensions of interface design, resource support, pedagogical and ethical were used in the data analysis as were Moore’s (1989) Three Types of Interaction (student to student, student to instructor, student to content). Through both quantitative and qualitative data, the findings showed that MOOC participants found these tools to be helpful and can help create an active, collaborative, and participatory learning environment where they could share ideas and connect with other participants. Considerably more students participated by reading posts to the discussion forum, Facebook and Twitter than did posting themselves. The findings also indicated a poor interface design and low quality or low response to feedback from teachers and peers can impact students’ participation and perception of the usefulness of these tools. The diversity of MOOC participants (i.e., diverse knowledge levels, language skills, and geographical locations) creates challenges to communication in MOOCs that should be taken into consideration in the design of MOOC activities.

CHAPTER 3: DIMENSIONS FROM THE POINT OF VIEW OF THE MEDIA AND THEIR PROPERTIES

This chapter focuses on aspects of the technological and interface dimensions of Badrul Khan’s model, arguing that there is a correlation between the medium of instruction, students’ performance, and the instructional content. Media-based learning is not necessarily more effective, simply because it uses a
medium. Some students self-select online learning because they are successful; others with different learning styles just are not successful, for a variety of reasons. Several variables exist that influence student success: the medium itself, its properties; production and consumption restraints; the content and the way it can be presented in the context of a specific medium; and learners’ cognitive styles. All these variables and more have to be taken into consideration, alone and interacting, in order to decide whether and where media-based learning is to be used, and where and with whom it might be counterproductive.

CHAPTER 4: TEACHER CONCEPTIONS AND APPROACHES TO BLENDED LEARNING ENVIRONMENTS

This chapter provides an Australian perspective on blended learning in the face of its becoming a requirement for all higher education teachers. An overview of the ways in which the concept of blended learning is interpreted in the Australian higher education establishment is presented. This is followed by a discussion of the results of research carried out at one Australian University about teachers’ conceptions about blended learning and their approaches to course design and teaching in higher education. On the basis of twelve interviews with teachers using blended learning, some important factors are analyzed pertaining to Khan’s (1997) model: pedagogical, technological, user interface, and evaluation dimensions as well as resource support, management, ethical, and institutional. Research findings indicate that teachers consider their subject’s learning objectives and apply the dimensions and approaches that will work best for their students. The author suggests that the findings of this study can be used to inform these approaches, whether they are focused specifically on academic pathway programs or more broadly across all blended learning courses.

CHAPTER 5: EVALUATION OF MOBILE LEARNING SYSTEMS WITH THE EIGHT-DIMENSIONAL E-LEARNING FRAMEWORK

Mobile learning, using a variety of portable, small-screen devices, offers access to education for everyone free of space and time limitations. Even though mobile learning, when used to support traditional education and enhance distant education, seems to have many advantages, there are also some significant disadvantages. Therefore, evaluating mobile learning using the various dimensions of Khan’s (2005) Framework will contribute to the literature and to practice through revealing the antecedents of these advantages and disadvantages. Khan’s (2005) eight-dimensional e-learning framework is explained with its dimensions specifically adapted for use in mobile learning contexts. As an example of the application of the Framework for Mobile Learning, Coursera, which is among the MOOCs that has a dedicated interface for mobile devices, is evaluated.

CHAPTER 6: MASSIVE OPEN EVALUATION – THE POTENTIAL ROLE OF CROWDSOURCING FOR IMPROVING E-LEARNING QUALITY

Given the complexity of developing programs, services, policies, and support for e-learning, academic and training leaders may find it challenging to regularly evaluate programs to improve quality. Are
there new opportunities to expand user and stakeholder input, or involve others in e-learning program evaluation? This chapter asks researchers and practitioners to rethink existing paradigms and methods for program evaluation. Crowdsourced input is defined and suggestions made to help leaders and stakeholders address persistent evaluation challenges and improve e-learning quality, especially in Massive Open Online Courses (MOOCs). After reviewing selected evaluation paradigms, models, and methods, this chapter offers a possible role for crowdsourced input and examines the topics of crowd definition, affordances, and problems, to begin a taxonomical framework with possible applications for e-learning. Crowd intelligence can potentially move e-learning stakeholders closer to realizing more innovative designs and learner support. As educators strive to make e-learning more global, inclusive, and learner-centered, program evaluators should do the same with e-learning evaluation.

CHAPTER 7: TO MOOC OR NOT TO MOOC? THAT IS THE PROBLEM – A LEARNER’S PERSPECTIVE

The authors of this chapter decided to investigate the perspective of MOOC participants and actively participated in and completed 20 MOOC courses on different platforms over a period of 2 years. They were aware that quality in MOOC courses is not consistent and students have little opportunity before enrolling to determine if a particular MOOC will meet their educational goals. The authors used Khan’s Framework to evaluate their experiences, turning the factors in each dimension into Likert-scale questions and assigning a score to each course, which led to their discovering a wide gap in scores. The lowest scoring courses focused largely on information transmission though long videos with little interaction and little evidence of instructor presence. The highest scoring courses were highly interactive and engaging with discussion, instructor feedback and assignments to keep student interest high. Results expressed that MOOCs need thorough attention in designing so that they will meet user goals and be effective to continue keeping the users interest.

CHAPTER 8: HISPANIC LEP MOOCs + MEETUPS

The Hispanic LEP Coding MOOCs + MeetUp proposes a plan as an alternative for the Hispanic Limited English Proficient community to continue their education by using Massive Open Online Courses (MOOCs) around IT and Computer Coding topics and by developing communities of practice through Meetups. “Meetups” are face-to-face organized opportunities for MOOC members to meet regularly throughout the course of a MOOC to share in their learning. By focusing on the Hispanic student’s needs, the study proposes a plan of action that involves a culturally relevant education perspective and the participation of different educational stakeholders interested in supporting the Hispanic community.

CHAPTER 9: GUIDELINES FOR THE DESIGN OF MOBILE LEARNING

This chapter provides guidelines for designing and implementing mobile learning from the perspective of many of the stakeholders. As technology evolves, there is a shift towards the use of mobile technology to deliver education both on-campus in a blended format, and online delivery. This shift is moving at a
very fast pace, which creates a major challenge for educational organizations which have to train staff, organize resources, and build the infrastructure for mobile delivery. Educators have to be trained on how to develop quality mobile learning materials, how to use the technology for the delivery, and how to provide quality support to students so that they are successful when using mobile technology to learn.

CHAPTER 10: LEARNING WITHOUT BOUNDARIES – MOOCS IN MALAYSIA: DESIGN AND IMPLEMENTATION

Massive Open Online Courses (MOOCs) in Malaysia are a very recent development but just the latest step in a ten-year effort to provide quality online learning in Malaysian education. Higher Education institutions in Malaysia have consolidated their efforts since 2007 to share expertise and experience in developing and presenting online courses. The first Malaysian higher education institution announced its pilot MOOC offering in March 2013. In 2014, five more higher education institutions cooperated to begin offering MOOCs on two different platforms. At the moment, these initiatives represent a preliminary phase in MOOCs, where Malaysia’s approach can be described as exploratory, focusing less on reaching the widest possible audience, making a significant mark globally or competing with established providers like Coursera, edX and Udacity, but more on learning to use web-based technology to complement current educational delivery systems at the higher education level and introducing MOOCs to the general Malaysian audience.

CHAPTER 11: SEMANTIC MODELING FOR E-LEARNING COORDINATION

This chapter discusses a continuing research project on Interface design and the application of a Semantic Web initiative in e-learning; i.e., the design and development of markup and annotation tools, relevant ontologies and intelligent agents in meeting learner needs. This will harness the possibilities of computers’ artificial intelligence capabilities to individualize and personalize the learning experience, based on student input. This chapter presents a metadata model for e-learning coordination based on content semantics grounded on Semantic Web concepts. E-learning models are surveyed to identify process content, such as phases, activities, data schema, rules and relations, so on, as relevant for a coordination model. The study looks into the mechanism of the e-learning environment and how e-learning processes can be classified for purposes of activity coordination. A metadata model for coordination of e-learning is being sought as expressed in Semantic Web concepts and transcribed using the related languages like OWL, RDF, SPARQL and others. A learner centric proposal is advanced which augments the IEEE Learning Technology Standards Committee’s industry leader Learning Technology System Architecture. Examples are worked out and future research directions are identified.

CHAPTER 12: A COMPREHENSIVE PROJECT – E-LEARNING AND FACULTY DEVELOPMENT IN HIGHER EDUCATION

The growth of online higher education and advances in technology justify and encourage new models of faculty development, related to e-learning. This chapter describes a multi-campus faculty development
Preface

program in five Nursing programs using distance technology, a community of practice (COP) model, and an e-learning framework. Khan’s (2005) Flexible Framework for E-Learning guided the planning and implementation of the multi-year, multi-campus, faculty development program. This chapter focuses particularly on the fifth year of the program that specifically addressed e-learning. A variety of strategies were used to deliver the faculty development program including use of campus-based site leaders, participating scholars, monthly videoconferences, a faculty development handbook, hands-on use of new e-learning technologies, and a year-end conference. The program also included an evaluation, using Khan’s Framework, of the interface design of the courses used in a collaborative online nursing program with findings reported to faculty. Along with the strategies used, barriers and evaluation of the multi-campus faculty development model are presented so that the faculty development model can be replicated across other universities and disciplines.

CHAPTER 13: ELEARNING READINESS IN PUBLIC INSTITUTIONS

This chapter reports on an e-learning readiness study that was supported by the Kuwait Foundation for Advancement of Sciences (KFAS) under project number 2013-11109-05. The study was carried out to assess the organizational and individual “readiness for e-learning” factors and perspectives of two major stakeholder groups (teachers and students) in the secondary education institutions in Kuwait. The research questionnaires are included and responses analyzed in this chapter. Results provided significant information to the Kuwaiti policy makers and regulatory bodies for the development of successful e-learning strategies. The chapter looks specifically at some factors at the initial stage of an e-learning introduction that can have tremendous impact on the later stages of the process. Later on this chapter, discussion and suggestions are presented to be instrumental in implementing successful e-learning strategies for many countries, specifically Kuwait, and will also benefit eLearning initiatives in similar institutions in other Gulf Cooperation Council (GCC) and beyond.

CHAPTER 14: BUILDING SUSTAINABLE CAPACITY IN HEALTH RESEARCH THROUGH E-LEARNING IN RESOURCE CONSTRAINED COUNTRIES

This chapter focuses on a novel capacity building approach adopted by a European Union funded project, entitled “Asian Regional Capacity Development for Research on Social Determinants of Health”, to increase the number of available health-care research scientists in Asian countries. Social determinants like income level, nutrition, education, occupation, gender, and poverty influence the health status of an individual, resulting in wide disparities in the health status of different socio-economic groups. Therefore, efforts to reduce health inequities can be strengthened by incorporating a Social Determinants of Health (SDH) approach in creating Health Care policy. However, this will require an increase in the number of health research scientists in low and middle-income countries, having the research and investigation skills to conduct the necessary research on existing conditions. The chapter describes the project’s innovative use of educational technologies to deliver education and training that would be helpful in building new research training capacity on social determinants of health in low and middle-income countries. The capacity building approach adopted by the project will reduce brain drain, is more family and climate friendly, and will also encourage gender equity within low and middle-income country-based training.
CHAPTER 15: EXPLOITING 3-D MEDICAL EQUIPMENT SIMULATIONS TO SUPPORT BIOMEDICAL ENGINEERING ACADEMIC COURSES

This chapter discusses an innovative program to build 3-D training simulations for students and trainees in the field of Biomedical Imaging. Biomedical Imaging is a rapidly evolving area, where new versions of advanced medical equipment and new methodologies based on complex physical phenomena are constantly being developed. This makes constant pre-service and in-service training critical for medical technicians using imaging equipment. The cost for effective training of both academic students and company employees in real training environments is high and in many cases impossible, due to lack of access to the latest versions of imaging equipment. It is often not possible to effectively transfer knowledge due lack of access to equipment in the field, which has a strong effect both on the theoretical understanding and the practical skills of students. On the other hand, the exploitation of 3-D simulations enables for better knowledge acquisition by learners and the opportunities for unlimited virtual practice. To this end, interactive 3-D medical equipment simulations have been developed by exploiting open source software and delivering them through the Web and e-Learning environments. This chapter presents the need for such environments, the development tools used, the challenges, solutions and possible applications.

REFERENCES


