

Preface

OVERVIEW

In many places around the world, Web 2.0 continues to be promoted as the new incarnation of the Internet because of the social networking aspects afforded by the supporting technologies. This general acceptance may be due to the evolutionary nature of the ripple effect of the human-dimensions of the whole Internet environment. As a result, there are many ways to view the term *Web 2.0*. Firstly, in the sense that it represents both a range of information and communications technology (ICT) tools that enable businesses to profit. Secondly, it is by its meme-like characteristics that are emerging as cultural dogma in new ideas and values, or patterns of behavior, which are passed from one person to another as if by symbiotic imitation. It is the latter definition that sets a broader context for this book, expanding the discussion beyond the popular generation of Web-based tools and educational sites. This book sets out to predict what the future holds in store for both the corporate sector and educational institutions alike, through Web-mediated education and training environments that enable openness, interaction, and teach communities to flourish.

OBJECTIVES OF THE BOOK

The overall objective of this book is to follow on from the previous Premier Reference Source book published in 2007 *Enhancing Learning Through Human Computer Interaction* to provide a useful handbook on adopting interactive Web 2.0 tools that promote effective human-computer interaction (HCI) in ePedagogical practice for education and training. Its main purpose is to provide a design manual for the novice educational-HCI designer. Web 2.0 tools are often described in an endless list of discussion or blogging type tools, ignoring the need for finding new ways to improve our ePedagogical strategies.

The chapters in this book are devised to focus interest on eLearning best practice in corporate performance that is applicable to the education sector. In so doing, it brings forward traditional instructional design frameworks, which involve interactivity on the Internet that have succeeded in the business arena, in a language that is familiar for teaching and learning institutions in schools and higher education.

TARGET AUDIENCE

Industry training developers, corporate trainers, courseware designers, government sector specialists, infrastructure policy makers, educational technology practitioners and researchers (school teachers, higher education), and post graduate students.

INTEGRATING ePEDAGOGY INTO ONLINE CLASSROOMS

For many of us, knowing how to learn is something that improves as we grow older. For the most part, as we travel along our lifelong learning path, it becomes easier to differentiate which instructional strategies are likely to suit us best. The ICT tools of digital age are redefining pedagogy such that many of us simply cannot keep abreast of the emerging instructional space we are calling ePedagogy in this book. The difficulties we are likely to face with online instruction may depend upon whether there are suitable instructional strategies to cognitively fast-track the learning tasks. It is well known that novice learners require the full range of rules and information related to learning something new, whereas an experienced learner might only require a quick revision (McKay, 2008). Research has clearly demonstrated that beginners or novice learners will respond best to measured amounts of guidance through progressively more complex instructional/learning content with strategic opportunities for interactive practice examples along the way (Merrill, 2002). Alternatively, a person possessing a more complete grasp of the task online will likely want to experiment first, preferring to refer to the rules and basic information only when they need assistance. Unfortunately there are many online programmes that do not cater for both modes of learning. When instructional systems cannot adapt to this important requirement, they run the risk of demotivating both groups of learners (Tennyson & Bagley, 1991). The result may be confusion for novices when the primary rules and examples are not sufficiently explicit, and boredom and frustration for the experienced learner who is forced into following the complete instructional strategy.

In seeking answers to the dilemma of how to provide such flexible ePedagogies, our attention should turn to the valuable body of work that is relevant to our discussion by Repovs and Baddeley (2006). They say that working memory has proven to be an important part of the human's cognitive system, providing the ability to maintain and manipulate information in the process of guiding and executing complex cognitive tasks. With ePedagogy, such cognitive tasks may need to involve past experiences that are encoded and held in our memory as retrievable information (or prior domain knowledge). An important principle for unlocking this prior domain knowledge is to integrate the screen-based information into our working memories while our prior experiences/knowledge is held in our long-term memories, according to Kalyuga (2005).

Therefore, this book proposes that the design of instructional materials or the ePedagogy must include consideration of the level of expertise (prior domain knowledge) of the learners. Research shows that most adults have relevant experiences that either drive them or demotivate them to learn, and that when the content and design of instructional materials do not challenge or interest them, they may become demotivated.

THE HUMAN-DIMENSIONS OF HCI

While many organisations have eLearning Websites that include courseware and other online learning artefacts, they often lack a coherent and effective broad-based eLearning strategy (Rosenberg 2001). We are suggesting that the human-dimensions of HCI offer the strategic glue for successful online training which Rosenberg notes is lacking. The human-dimensions of HCI are but one piece of the complicated computer-usability or techno puzzle that involves two distinct contexts. One relates to the human-dimension or social context of computing, while the other relates to the machine side, with people's perspectives shaped by the performance of the technical computing components (McKay 2008). The literature deals more often with the latter. It is only in recent times that a voice has been given to computer-usability issues that involve the human-dimensions.

Considering the human-dimensions of HCI provides a useful framework for understanding how adult learners prefer to participate in online training. Attention to their prior knowledge increases learners' willingness to participate. Yet, there is little evidence that instructional design in the government sector includes recognition of the factors that encourage a positive attitude towards participation. We discuss some of these issues below.

WEB-MEDIATED EDUCATION/TRAINING

Web-mediated learning programmes require flexible interaction depending upon whether the learning event involves instruction – then implement a training programme that facilitates improved performance outcomes; if it is purely an information giving exercise, the Web-mediated ePedagogy will require a *knowledge management strategy* instead.

TERMINOLOGY

A short word is given here to afford a more comfortable reading stance; this is necessary as the ICT paradigm extends across so many philosophical fields. Authors may at times refer to the following terms without providing satisfactory clarification. For instance:

- **Synchronous/Asynchronous:** The former usually refers to a ePedagogy that requires interaction (facilitator/trainee) occurring in the same timeframe; while the latter refers to situations where the facilitation and learner/trainee interact at different times.
- **Face-to-Face:** Refers to the more traditional classroom pedagogy where there is a one-to-one interaction between the instructional facilitator and the learner/trainee.
- **HCI:** There are some authors who refer to this term to mean human computer *interface* (instead of interaction). This simply identifies that they describe the screen-based characteristics, rather than the interaction.
- **LMS:** Refers to the proprietary *learning management systems* that are accepted as off the shelf software management applications.
- **Wiki:** This term usually refers to a Website that is developed collaboratively by a community of users, allowing any user to add and edit content.
- **Blog:** Or *Weblog* describes a personal online journal - intended for public viewing that is frequently updated by the blogger/author.

SCHOLARLY VALUE AND CONTRIBUTION

The chapters in this book directly compare traditional pedagogy with emerging ePedagogies in a variety of higher educational, corporate and elementary/secondary school settings. These instructional forums provide a diverse range of positive outcomes linking information management techniques that enhance the leverage of ICT tools in a specialist educational context. Through the global nature of the authorship contribution, this book reveals the impact of increased awareness for promoting more effective HCI in the classroom/training sessions that benchmark ePedagogy.

CONTRIBUTIONS

This book is organized into 14 chapters, which fall into four main themes, including: *Technology and Change Management for the Web 2.0 Environment*; *Social Networking and Collaborative Learning Through HCI*; *ePedagogy and Students' use of HCI Interactive Learning Environments*; and *Rich Internet Applications and HCI in Educational Practice*.

SECTION 1: TECHNOLOGY AND CHANGE MANAGEMENT FOR THE WEB 2.0 ENVIRONMENT

The corporate environment is shifting instructional design away from taking a more traditional approach to their online training, which previously relied upon adopting ICT tools in face-to-face sessions, to concentrate on developing ePedagogies that encourage customized Web 2.0 enriched courseware. In recent years the adoption of Web 2.0 enhanced tools (otherwise referred to as multi-media) has been researched by a diverse mix of professional disciplines. Accordingly adoption of these enhanced ICT tools is defined here as the decision to implement an online solution to solve an educational need as well as business workforce training/reskilling. Many of the authors of this book are describing operational ePedagogy design, which means they are concentrating on a set of *user-centred activities* that people and their computers need to perform upon their educational/corporate information resources. ICT adoption can therefore be studied at three operational design levels. The first level relates to the need for developers of online education/training programmes to understand how corporate-level investment decisions in online training are made. The second level applies to the user-centred perspective of the trainee/learners to explain what people do with their online experiences. The third level is closely connected to the previous, which examines the information systems (IS) design and development process to evaluate why online training adoption rates are not keeping pace with Web 2.0 advances.

Chapter 1: *Managing Expectations: A Changing Landscape* – This opening chapter writes about adopting practical strategies to enhance eLearning in the Web 2.0 environment. As such, it serves as an excellent example of how to deal with the changing nature of asynchronous ePedagogies. It highlights the need to plan for the changing profile of our 21st century tertiary students; describing both sides of the specialist online educational equation, to highlight discrepancies in both student and staff expectations. Set in an Australian University, the author describe an educational scenario that will be of interest to online facilitators in both the corporate and educational settings alike.

Chapter 2: *The Role of Social Media as a Tool for Learning* – Set in the USA, this chapter describes the theoretical basis for social media effects upon learners' adoption of Web 2.0 tools as seen through the corporate training practice lens of the authorship. It speaks of a social presence and the perils of transactional distance; while taking a constructivist approach towards dealing with community and the socio-cultural context of knowledge.

Chapter 3: *Assessment and Learning Partnerships in an Online Environment* - Set within an Australia university's research study, this chapter shows how the online environment is used to promote quality teaching in a professional development course and online assessments for students and teachers. This data is used to inform teaching decisions by drawing on performance assessment procedures that monitor the teacher's discipline and pedagogy skill development.

Chapter 4: *Development of the Assessment Design and Delivery of Collaborative Problem Solving in the Assessment and Teaching of 21st Century Skills Project* - This chapter describes effective HCI strategies for the Web 2.0 environment seen through a corporate training practice lens, as it involves academe with industry and government stakeholders. It outlines a developmental framework that indicates whether people have learned anything; shifting the direction of assessment towards a unified model of skills that people require for the 21st century. The context for this Australian research involves a technology-based design and the delivery of assessments that relate to collaborative problem solving skills.

Chapter 5: *Facilitating Learning by Going Online: Modernising Islamic Teaching and Learning in Indonesia* - This chapter describes a study conducted in Indonesia. It is the first of the two chapters in this book, which describe emerging technology and change management issues for ePedagogies in a Web 2.0 environment. This chapter concentrates on the impact of eLearning social media tool adoption in a socially conservative environment. There is an interesting discussion on progressive non-governmental organisations as they seek to increase ICT access to the learning institutions that normally miss out on such Internet access.

Chapter 6: *Rethinking Web 2.0 Learning via Third Space* - Set again within an Australian university. Like the previous chapter, this is the second chapter which deals with the emerging technology and change management issues for eLearning in the Web 2.0 environment. These authors analyse novice teachers' use of collaborate software through interactive social learning experiences that include: virtual classrooms, online conferencing and instant messaging. This research raises issues that challenge the approach to adoption of such ICT tools in an educational/training setting.

SECTION 2: SOCIAL NETWORKING AND COLLABORATIVE LEARNING THROUGH HCI

Creating collaborative work space is certainly not a mere theoretical dream anymore; it is now a reality brought about with the advent of eCommunities. More and more we are seeing how the corporate workplace is engaging directly with information through social networking to such an extent that it is giving rise to the term information or knowledge worker. In a sense, collaboration is a bread and butter skill for most people in the workforce – where the triple bottom line matters the most. For those readers who may not be aware – triple bottom line is derived from the accounting profession; it means expanding the traditional reporting framework to reflect the ecological and social performance in addition to financial performance. Some of us believe that collaborative work space is therefore a commercial necessity, if we are to survive in a global business environment. However, there are major hidden costs

in such global networking. According to Felman, Marcobella, Duhl, and Crawford (2005), the hidden costs to a corporation for their information work with 1,000 information workers - with an average salary of US\$60,000 each per year, plus benefits - is US\$30 million for wasted time. There can be no doubt this is telling us there is enormous potential for software developers to come up with more efficient and effective collaborative ICT-tools that are easy to understand and use. In keeping with this approach to collaborative learning through effective HCI, this section contains two chapters that concentrate on the synchronous/asynchronous ePedagogies in building Web-mediated communities.

Chapter 7: *Bringing Web 2.0 into the Learning Environment* - Canada provides the backdrop for this interesting chapter. It has been written through the personal experience of the undergraduate student/authors and their facilitator. They provide commentary on their four-year online learning programme. They propose that the gap between synchronous and asynchronous environments is closing due to the classroom becoming “one part of a larger, continuous learning experience.”

Chapter 8: *Networked Learning and Teaching for International Work Integrated Learning* - The setting for this chapter involved two universities in Australia and Vietnam. It describes the role of ICT services and tools that support international work integrated learning in building Web-mediated communities, pointing out where improvements to their ePedagogy will enhance their instructional outcomes. The researcher utilized a qualitative methodology to provide detailed student feedback.

SECTION 3: ePEDAGOGY AND STUDENTS' USE OF HCI INTERACTIVE LEARNING ENVIRONMENTS

Content and quality of ePedagogies need to be designed with the utmost consideration for effective learning/training. To achieve this, it is useful to think that the ‘e’ in eLearning refers to how an online course is digitised, while the ‘learning’ refers to what the course content involves and the instructional strategies (ePedagogies) required to achieve the expected learning outcomes. Following on from thinking about the what, in terms of instructional content - is to consider that the why is about helping individuals achieve their educational goals or assisting organisations to improve employee skills and workforce performance (Clark & Mayer 2008). For employees/corporate trainees to engage more intuitively with eLearning, it is therefore important for designers to consider the impact of HCI on adult learners; that is, to measure their learning outcomes effectively. Jasinski (2007) asserts that eLearning may facilitate highly valuable training and skills development. Yet if the learning achievement is not measured, employers and employees will be less inclined to participate or believe in the potential of eLearning. Moreover, it is difficult to measure the effectiveness of eLearning; however, this goal is a design challenge shared by other types of training and workplace strategies (Jasinski 2007). If effectiveness is not measured appropriately, there will be no legitimate evidence that eLearning occurred. The next five chapters reflect this approach as they tell us how they have gone about integrating HCI into their ePedagogies that include: solutions through their classroom use of multi-media and integrating interactivity into their asynchronous strategies.

Chapter 9: *Wiki-Mediated Peer Review Process: Participation and Interaction* – Set in Vietnam the author of this chapter writes about how the research dealt directly with performance measurement to explore whether the collaborative potential offered by Wikis translates into actual practice. The research adopts a mixed method that includes qualitative and quantitative data analysis.

Chapter 10: *E-Citizenship Skills Online: A Case Study of Faculty Use of Web 2.0 Tools to Increase Active Participation and Learning* – An Australian university’s higher-education course-unit on social informatics sets the context for this chapter which explores the impact of informatics in our society.

Chapter 11: *A Study on a Problem-Based Learning Method Using Facebook at a Vocational School* – Set in an agricultural college in Taiwan, this chapter explores the effectiveness of a problem-based ePedagogy using Facebook to enhance the attitudes towards learning for sophomore students. Research findings are given, followed by suggestions for future studies.

Chapter 12: *Web-Mediated Education and Training Environments: A Review of Personalised Interactive eLearning* – This chapter reviews the literature to provide us with a comprehensive and interesting description of such strategies which amount to an emerging ePedagogy. It points out there are many issues, concerns, and obstacles that prevent personalised eLearning realizing its true potential.

SECTION 4: RICH INTERNET APPLICATIONS AND HCI IN EDUCATIONAL PRACTICE

To introduce the final two chapters, a small word or two is necessary to explain this rather sophisticated or high-end IS computing environment in simple language for the uninitiated reader of this educational technology book. The current range of ICT tools provide a range of powerful features that include: easier access, updating capability, scheduling of tasks, and flexible environments for both learning facilitators (teachers and corporate trainers) and their students. There are three ICT elements that represent a rich Internet application (RIA) that are necessary to drive a successful ePedagogy. These RIA elements include: rich client technology, server technology, and development tools. The so called rich client technology (the Flash player is a good example) provides all the hidden operating benefits of the Web by keeping costs to a minimum (automatic compression and loading of components on demand). In addition there is: client-side scripting, high performance connectivity, real-time server communication. Server technology provides the markup languages to connect to the rich client technologies; for example Web database language tools. Development tools offer an environment that provides the ability to create the various pieces of an application - from user interfaces to server-side logic. Staffing this type of ICT production event requires a mixture of IT professionals: an application architect to integrate the ICT tools into an existing environment, a multi-media expert to develop the interactive graphical user interface and communications service with the application server, and a Web-designer in the initial stages of a system’s development project to consult on the user interface specifications, and act as the conduit between the architect and multimedia practitioner. A successful RIA can offer a range of benefits that include: distributed, server-based internet applications that extend the interactive capabilities of desktop applications. As such, they should enhance the user’s interactivity and manipulation of data, rather than behave as fancy graphical page-turners. They should provide the user with a real-time status check mechanism whenever background processing is underway. This way, informed users can understand and stay oriented during a lengthy activity. Finally, because a RIA can store client-side data, this allows customization of their interaction during a system processing cycle.

Chapter 13: *The Use of HCI Approaches into Distributed CSCL Activities Applied to Software Engineering Courses* – This chapter deals with educational/training design as it relates to RIA support systems described above. The authors describe this educational technology environment in easy to read language that belies the complex nature of the RIA it represents for managing their synchronous/asynchronous interactions necessary for their software engineering course.

Chapter 14: *A Case Study of Designing Experiential Learning Activities in Virtual Worlds* – The last chapter ends the book as it provides the reader with a generous and interesting insight into a virtual classroom experience. This chapter is certainly a fitting one to complete the contributions. It treats us to an undergraduate online experiential model that took place in Second Life, where the ePedagogy challenges were mostly due to technical issues.

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