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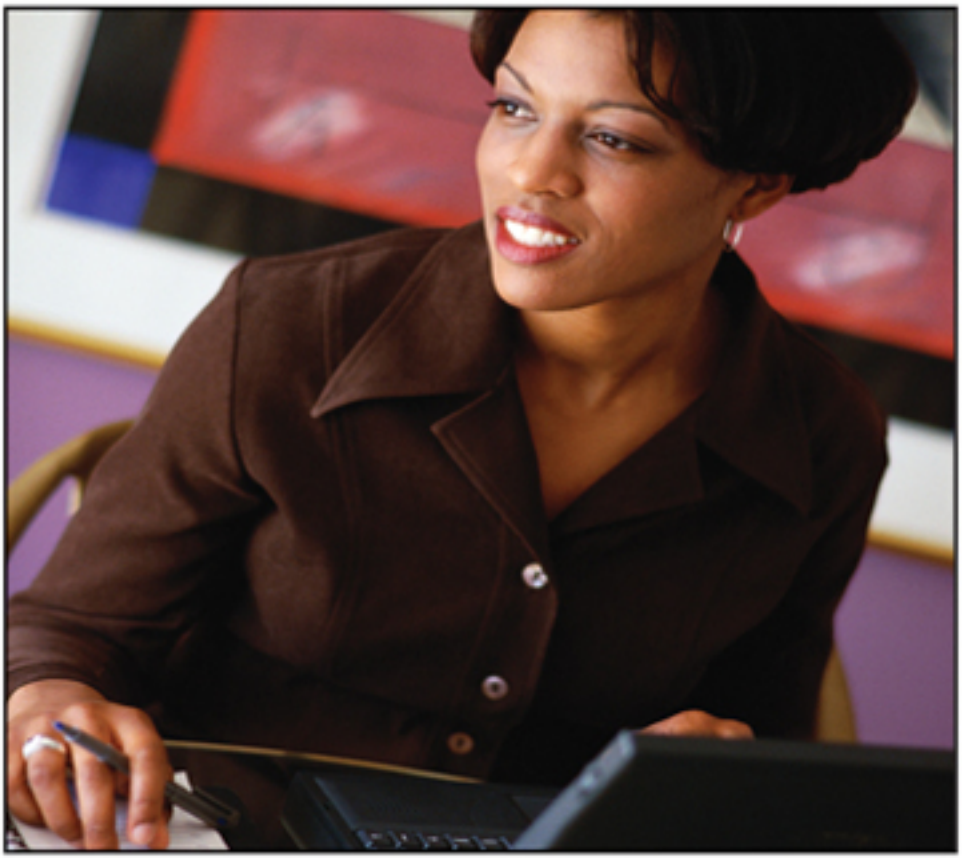
Adult Learning in the Digital Age

Perspectives on Online Technologies and Outcomes



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Adult Learning in the Digital Age:
Perspectives on Online Technologies and Outcomes

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developed by Garrison, Anderson and Archer (2000) has been introduced as a promising theory for adult learning in online environments.

Section 2
Web 2.0 Technologies, Adult Learning, and New Educational Possibilities

Section 2 provides the readers with a wide range of technological tools used to advance the practice and mission of adult learning. Using technology such as Facebeook, blogs, and other Web 2.0 technology, educators will have the opportunity to learn new strategies, models, and tools to enhance the adult learning experience.

We know that technology is rapidly changing the world and it is hard to keep up. Social networking is the latest online trend we need to learn about. This chapter will consider the enormous changes that impact learners of all ages and offer some insights and resources for those professionals who want to provide more than just another lonely online learning experience.

Learning is considered as one of the potential tool to empower a community. Over the past three decades, technology mediated learning has been recognized as an alternate channel replacing/ supporting/ strengthening the traditional forms of education in various forms, especially with the advent of interactive and collaborative learning. This chapter focuses on a program that has been initiated in a rural corner of Bangladesh to enclave grass roots communities as part of the lifelong learning processes.

The purpose of this chapter is to describe the development of a practical model that emerged from the inquiry made. The initial model has been created based on experiences and literature review.

This chapter explores the emergence of online digital media, specifically Facebook, as a space of resistance and submission to consumerist ideologies. Online digital media function as a form of public pedagogy, serving as a platform for implicit lessons in cultural norms and roles that reinforce hegemonic social structures operating in the physical world. In this chapter, the authors raise issues and questions regarding the determinacy of online digital media: is Facebook a pedagogical tool for reinforcing corporate interests or does it have the potential to be a space of resistance and democratic discourse?

Chapter 15

This chapter presents a case study in which an online experience for adult learners facilitated improved understanding of blogs and its applications to K-12 classrooms. The chapter further discusses processes and results given the contexts of adult learning and instructional technology as well as suggests directions for effective practice.

Chapter 16

This chapter focuses on preparing faculty who are in need of technology skills. The researchers and authors of this chapter have garnered grants to involve training faculty in instructional technology. Through their experiences, the authors and researchers have isolated seven key practices that make such training successful. This chapter describes those practices and supports the findings of the primary research with secondary research on andragogy and Marc Prensky's ideas of the literacy divide that exists between "digital natives" and "digital immigrants."

Chapter 17

Brazilian companies are increasingly turning to web-based corporate training by virtue of the fact that they need to train their employees within tight budget constraints in a country of continental dimensions. This chapter seeks to investigate some key success factors associated with such digital enterprises. In order to achieve this, the multiple case study method is used, whereby two cases, both conducted within the same Brazilian company, leading to opposite outcomes – a success and a failure – are analyzed in depth.

Web-based learning environments have become an integral part of learning. The way that they are employed in the learning process, or in other words the learning strategy followed in that respect, is an important issue that has to be carefully thought of, deciding upon topics such as suitable pedagogical approaches and appropriate assessment techniques for a given context. The chapter deals with this exact issue by visiting the relevant literature on the subject, describing selected learning strategies that have been employed in the use of an innovative eLearning platform in schools in Europe and finally outlining and comparing two real case studies from two European countries.

Foreword

Today, I learned my 2:00pm webinar was available to stream directly into my iPhone. I followed the meeting planner's link and in two minutes I downloaded the application and am now untethered from my desktop. Last month, I installed a desktop interactive video conferencing system and now, instead of tying up a classroom, I teach from my office students at four Texas regional campuses. Last year, I joined Facebook and have happily "friended" several hundred classmates from the class of 1976 (high school), 1981 (undergrad), and 1992 (PhD). Next week, I am anxiously awaiting the arrival of my Kindle and will begin the conversion of my paper-based library to digital. I'm only 50 years old (the new 30) and when I began my career, none of this technology existed. Today, students *expect and demand* institutions (and aging faculty) to be technology literate. This book fills an important gap for those of us trying to keep up.

When I arrived at the University of Texas in 1992, I remember lobbying hard to convert email from the mainframe to my PC. I wanted the ability to easily attach files to emails and when that capacity arrived, collaborating within and across universities opened considerably. That marked the beginning of my digital library, both professionally and personally. Today, my computer has thousands of .pdf files of books, government reports, and peer-reviewed published manuscripts. My iphone has 74 full length books ranging from puppy training to the biology of the brain (Obama and I made the same promise to our children in exchange for moving). Across all my computers, I have close to two terabytes of digital content. Granted, the majority is music and video files, however research and teaching also fills a lot of space. The management and distribution of digital content has become an essential faculty responsibility.

At the University of Texas, School of Public Health, we offer master's and doctoral degrees in public health and related sub disciplines to students at the Houston main campus and five regional campuses across the state. By necessity, we transmit courses originating from any of the locations to all the others to over 1,000 currently enrolled students. Our students increasingly expect *synchronous and asynchronous* learning opportunities. All of our core courses are taught either in-person, by interactive video conferencing, or with on-line course management software. The challenges this system has created boils down to: (a) keeping up with the rapid pace of technological development, both in software and hardware; and (b) persuading faculty and administration to embrace (and pay for) new technological advancements. This book offers perspectives on both and serves as a guide to faculty who want to learn how to incorporate digital technologies to extend adult learning practices.

The digital revolution has rewritten the university professor's job description and that's why *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* is such an important book. Meeting at the crossroads of student expectations and technological advancements requires continuing faculty education in digital instructional design and delivery. In short, if you want to be a better instructor, read and study this book. Professor Terry Kidd has pulled together key leaders in instructional

design and web 2.0 technologies to help you leap into the 21st century. The book offers important case studies on the practical use of cutting edge technology. Learn firsthand how others are successfully changing their educational practices and how different organizations have approached content management and delivery. The book also steps back and offers viewpoints from philosophical and pedagogical perspectives and puts these into a framework for integrating web technologies into higher education.

I read the New York Times every day on my iphone. I also listen to books and podcasts, check my calendar, email, and Facebook. Occasionally, I actually make a phone call. From my laptop, I check student progress on Blackboard, comment on threaded discussion groups, adjust the weekly on-line self correcting quiz, and post slides for tomorrow's lecture. I also like to visit Netflix to stream a movie from any computer that's nearby. Mastering this technology makes life easier and more fun. Although I suffer from e-mail overload and because I can work from anywhere, I end up working all the time, embracing the digital revolution is better than the alternative: getting left behind. This book offers the heuristics and the tools to help you manage your online and digital teaching life. *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* is a must have.

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Preface

Behaviorism, cognitivism, and constructivism are the three broad learning theories most often used in the design of adult instructional environments. These theories, however, were developed in a time when learning was not influenced by information and communication technology. Over the years, digital technologies have grown and revolutionized how we live, think, communicate, and learn. As education moves forward into the digital age researchers must remain critical of implications ahead.

In recent years the declining cost of digital technologies have made digital technologies accessible to nearly everyone in all parts of the world, from inner-city urban neighborhoods in the United States to the rural villages in developing nations across the world. These new technologies have the potential to fundamentally transform how and what people learn throughout their lives. Just as advances in biotechnologies have made possible the "green revolution", digital technologies have made possible a "learning revolution" that has changed the face of education as we know it. This remains true for adult learning.

Adult learning within the scope of the digital age has emerged as a popular venue for both students and educational institutions. For universities and other educational programs, this introduction and expansion of digital technologies has completely changed the means and levels of educational access to reach and engage learners in distant and diverse locations. Given this new reality of a global technologically connected society, adult learners through digital technology will face an even greater challenge as digital technology becomes more pervasive and ubiquitous. Moreover, as instructors move further into the digital age, a new paradigm of digitally-enriched mediated learning has emerged giving way to theories and strategies for the adult teaching and learning process.

Adult teaching and learning in the digital age is moving away from the passive acquiring of factual information towards a more active application of knowledge. The focus is on assisting learners to construct knowledge and new ideas both as independent self-directed inquiry and communally in peer groups in order to demonstrate their knowledge attainment through enactment and application.

While digital technology could make a learning revolution possible, it certainly does not guarantee such opportunities. In most places where digital technology is used in adult learning, it is used simply to reinforce obsolete approaches to learning. Even as scientific and technological advances have transformed other fields, ideas and approaches to teaching and learning for adults remain mostly unchanged.

To take full advantage of new digital technologies, we need to fundamentally rethink our approaches to adult learning and education and our ideas of how digital technologies can support them. To that end, Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes will serve as a spring board to better understand the role of digital technology in adult learning.

With this ideal, the purpose *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* serves to identify the factors that shape and impact adult learning opportunities in the digital age. As educators move forward in this new frontier of teaching practice, understanding the impact of digital technology on adult learning is crucial not only in terms of the tools itself, but also of

the impact on those undertaking adult learning opportunities. The information presented in this text will lead to the development and implementation of innovative strategies that promote quality adult teaching and learning. In order to effectively develop a conducive environment for adult learning in this digital age and to capitalize on the digital technologies, instructional designers, educators, trainers, and facilitators must pay particular attention to the design of instruction, the mode of delivery, instructional and teaching practices, as well as the digital technologies employed to disseminate learning that occurs in adult learning online learning.

Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes provides a comprehensive framework of trends and issues related to adult learning for the facilitation of authentic learning in the age of digital technology. This significant reference source offers researchers, academicians, and practitioners a valuable compendium of expert ideas, practical experiences, field challenges, and potential opportunities concerning the advancement of new technological and pedagogical techniques used in adult schooling.

Based on the trends of adult learning in the digital age we often considered the following questions information: What knowledge is most important for adults to know? What are the best ways to transmit that knowledge from one person (a teacher) to another (a student)? What are the best ways to represent and display knowledge so that it is both understandable and learnable?

It's not surprising that these questions are at the forefront of instructors who strive to create a quality learning experiences for adult learners. However, the question that remains is "How do we best confront these questions and produce solutions for the adult learners in the digital age"? It's not surprising that these questions are at the forefront instructors who strive to create a quality learning experiences for adult learners. However, the question that remains is how do we best confront these questions and produce solutions for the adult learners in the digital age.

In order to understand this new frontier for teaching practice, *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* serves to bridge and support adult learning methodologies with digital ICT advancements. Further, this text will highlight the principles and theories of learning including the adult learning methodology or andragogy, active learning principles, and digital technology and its connection to authentic adult learning experiences. Moreover, other principles associated with this text includes instructional design, learning communities, learning management systems, web based instruction, and social networking.

Until we begin to rethink the uses of digital technology and their application to adult learning, digital technology will never live up to its full potential. Like paint, digital technologies can be used for designing and creating things. For example, students can create their own web pages, blogs, wiki's or podcasts that reflect their learning and learning outcomes. In addition students can create their own music files as an expression of their experience in the learning process. It is through the design activities that digital technology offers the greatest new learning opportunities for adult learners. Research has shown that many of the best learning experiences come when adult learners are engaged in designing and creating things, especially things that are meaningful either to us or to those around us.

Like art, digital technologies can also be used as "material" for making authentic lessons. Indeed, digital technology in adult learning is the most extraordinary construction material ever invented, enabling students to create a variety of products. In addition digital technology can be seen as a art, greatly expanding what adult learners can create and what they can learn in the process.

To that end *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* presents learning models that offers educators and students a wealth of information that was never possible in the classical age of education. The possibility of linking these ideals together worldwide in a multitude of formats creates a remarkably rich medium for learning allowing for a robustness of what

digital technology has to offer. *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* is not merely duplicate of an original discussion, but a new structured conversation that will spark the burning desire to continue strong teaching practices that include digital technology. *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* represents a new type of discussion which takes full advantage of the digital technologies in order to achieve an effective yet enjoyable learning process. Thus, with *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* concepts are introduced in innovative ways – ways that involve the adult learner and integrate them into the learning process. Moreover, *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* links to vast resources available worldwide and introduces new levels of value to adult learning in the digital age.

Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes can be envisioned as a dynamically-evolving resource that will prove beneficial to both the adult learner and instructors alike - making it a great source for strategy and content. In the light of this text, *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* presents evidence that assists in the design of authentic learning opportunities for adult learning. Thus, *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* teaches that authentic learning experiences in the digital age are developed through the efforts of a team of professionals with a complementary range of skills, as opposed to classical course design, which is typically developed by faculty alone. Designer and educators alike will have opportunities to see teaching practices and principles made alive for the next generation of adult learners.

The richness of *Adult Learning in the Digital Age: Perspectives on Online Technologies* and Outcomes allows for unlimited creativity when it comes to adult learning in the digital age. Such richness offers educators new opportunities to develop innovative learning material while posing a challenge in that it requires faculty to rethink their own teaching practices. In order to best serve adult learners *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* takes an active look at effective practices and strategies that inform adult learning. It is not enough for educational institutions to just give financial resources, hardware and software, however, they should fundamentally equip educators to effectively teach, engage, extend, and enhance the adult learners educational experience.

By equipping all stakeholder for effective adult learning practices, *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* offers effective design strategies, content, learning templates, materials, and models to further quality teaching and active student engagement within the realm of adult learning. It is important to understand that in order to foster an environment conducive to effective learning in the adult learning atmosphere, we must pay close attention to the factors that affect instructional quality as discussed in this new frontier of learning. For such research, the future seems very bright and encouraging. This theme will be repeated as other aspects of the digital age come under scrutiny. We know enough at this point to optimize quality in visual aesthetics, however the instructional quality and quality of deliver is more difficult to define and measure; that is why *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* offers to fill this gap with strategies, process, and procedure effectively engage all stakeholders in the development of adult learning in the digital age.

In order to provide the best balanced coverage of concepts and issues related to the topics of this book, current researchers from around the world were asked to submit their chapter describing their unique coverage of adult learning in the digital age and the new teaching practices associated with such innovation. Each chapter submission began with the proposal phase. Following the submission phase, each proposal was submitted for blind reviewed by a team of reviewers who indicated the accepted or rejection of the chapter proposal. Following the proposal review phase, each author was then given

permission to complete their own chapters for the book. After completing their respective chapter, the chapter was then submitted once again for blind peer review once more. After a two round rigorous referred processed of two reviewers, the chapters that were strong and favorable from the reviewers were chosen as entries for this book.

The ideas presented in this book were assembled by the best minds in the online learning field. Further, the chapters authored were selected based on the author's expertise and leadership roles within the field as well as their unique perspective they tell relating to the subject. As a result of the double blind submission process, *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* highlights current concepts, issues and emerging trends relating to adult learning in the digital age. To this end, *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* offers twenty two chapters that highlights teaching digital immigrants, emerging frontiers of learning online through digital ecosystems and blended learning, empowering adult learning through blogs and social media, understanding the realities of a virtual learning experience, using course management systems to teach constructivist learning design skills to adult learners, community of inquiry in adult online learning, social networking, web 2.0, collaborative learning in adult learning, information literacy, and elearning.

With the mix of educational perspectives outlined in this book, a wide range of perspectives are covered to meet the needs of everyone. This book highlights adult learning and new associated teaching practices as a growing field of study which uses digital technology as a means to solving adult learning challenges. The chapters are not organized by industry; instead, they are divided into three major themes: introduction to adult learning in the digital age, perspectives on online technologies, and finally case studies for adult learning in the digital age.

For all practical purposes *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* discusses various methods and tools for assessment, testing and evaluation of effective adult educational opportunities and challenges the digital age presents. For future development of adult learning and associated teaching practices, this book presents information concerning the history, trends and major issues facing adult teaching and learning. In the end, this book contains a wide range of ideas, examples, guidelines, stories, models, and solution all with the basic premise improving teaching practices for adult learners

As adult learning in the digital age continues to progress, *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* will continue to serve the purposes of support quality instructional and teaching practices online. As advances in digital technologies reach a diversity of people and adult educational opportunities reach new territories, we can help and support to empower adult learners and related stakeholders throughout the world.

With the diverse and comprehensive coverage of multiple perspectives in adult learning education and its associated teaching practices, this authoritative book, *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* will contribute to a better understanding all topics, research, and discoveries in this evolving, significant field of study. Further, the contributions included in this book will be instrumental in expanding of the body of knowledge in this vast field. The coverage of this book will provide strength and support as a reference resource for adult learning. Not only will *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* provide support for better decision makers in obtaining a greater understanding of the concepts, issues, problems, trends, challenges and opportunities associated with adult learning in the digital age, *Adult Learning in the Digital Age: Perspectives on Online Technologies and Outcomes* will continue to provide all stakeholders with the curiosity to seek better ways of teaching.

It is my sincere hope that this publication and the strategies presented will assist all adult learning stakeholders in enhancing their understanding of this discipline and to effectively design and implement strong yet high quality online educational opportunities to meet the needs of our global and society. Perhaps this publication will inspire its readers to contribute to the current body of research in this immense field, tapping into possibilities to assist educational institutions in making all educational opportunities open to participants.

Editors

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Acknowledgment

Completing a project of this magnitude is a great challenge and an opportunity many chose never to undertake. It is with the help of many individuals who have inspired and motivated me to complete the journey that lie ahead.

I would first like to take this opportunity to acknowledge the considerable time and effort the authors have invested in their respective publications in this book. The authors presented within this book are intelligence and well seasoned in their practice and respective areas. Without the hard work, dedication, and in some cases sacrifice, this book would not be made into reality without the assistance of the authors. Thank you for being so gracious and patient under fire and accepting to my comments and ideas on your chapters. I would like to send a special acknowledge and thanks to my good friend and co-collaborator on this project, Dr. Jared Keengwe from the University of North Dakota.

Gratitude and acknowledgements go out to the reviewers who spent countless hours reading, proofing, and articulating their comments from the proposal stage to the final chapter revisions.

Special thanks must also go to the IGI Global team for their administrative support and help to bring this vision into reality.

I would also like to acknowledge and thank my good friend Ms. Peggy Powell at the University of Texas School of Public Health as well as, Dr. Steven Kelder, Dr. Irene Cech, and Dr. Gene Schroder for their encouragement, advice, and mentorship.

Further, I would like to pay a special tribute my to my nephew, who shows me it's a good thing to be a kid sometimes and to my dear sister who works hard to reach the limits in the sky.

And lastly, to my ancestors who were silenced and never saw freedom, this book is dedicated in their memory.

Terry T. Kidd, PhD (Candidate)
Editor

Section 1

Introducing Adult Learning in the Digital Age:
Tools, Processes, and Outcomes

Chapter 1
Emerging Frontiers of Learning Online:
Digital Ecosystems, Blended Learning and Implications for Adult Learning

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ABSTRACT

The potential for online education for adult learning have been well argued, and in recent times there have been eLearning initiatives to realise the potential offered by online education. Adult learning institutions, particularly Universities, have adopted and introduced infrastructure to support Learning Management Systems (LMS), Local Area Networks (LAN), Learning Management Content Systems (LMCS), and Virtual Learning Environments (VLE). Following discussion of those eLearning environments, this chapter will suggest that the limitations of those digital systems is leading to the next phase with the development of digital ecosystems conceptualised as learning platforms which keeps learning central, enables interoperability, and forms a base for building upon through use of new technologies and increased capabilities of educators to use information and communication technologies (ICT) for curriculum, pedagogy and assessment (Ingvarson & Gaffney, 2008). Digital ecosystems enable the integration of student administration, LAN (requiring teacher and student logins and passwords), VLE, content repository, community links, utilise Web 2.0 (social networking) technologies, and can have the adult learner as the central focus of the design of the platform and its functionalities. Subsequently, the chapter draws upon the findings of a research project (Sun, Tsai, Finger, Chen, & Yeh, 2007) which

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identified the critical functionalities for eLearner satisfaction to provide suggestions that the architecture and design of an eLearning system should be informed by the adult learners' perceived usefulness of the system (Pitnuch & Lee, 2006). More recently, the presentation of face to face teaching and online learning as alternatives has been superseded by conceptualisations of blended learning. Through presenting these learning environments in terms of their possibilities and limitations, and the emergence of blended learning, implications for adult learning will be synthesised.

INTRODUCTION

The importance of learners engaging online has increasingly been recognized in an information rich, digital networked world. As Sharpe et al. (2006) indicate, in relation to higher education and research into the impact of eLearning for institutions, practitioners and students, "We are now at a point where 95% [of] higher education institutions are operating at least one virtual learning environment [VLE]" (JISC, 2005) cited in Sharpe et al., 2006). Moreover, there is evidence to indicate that traditional face to face teaching is being blended with eLearning through the use of VLEs to supplement face to face teaching (Browne & Jenkins, 2003; Sharpe et al., 2006). Furthermore, Sharpe et al. (2006), in elaborating on these trends, refer to the Higher Education Funding Council for England (HEFCE) strategy for eLearning, which, in response to input from post-16 education sector, codifies "the prevalence of face to face teaching blended with e-learning (HEFCE, 2005).

In this chapter, the use of the terms 'online learning' and 'eLearning' are used to refer to the use of information and communication technologies (ICT) for learning. Unlike traditional timetabled instruction which takes place in buildings such as classrooms and schools, eLearning is characterised by web-based and Internet enabled systems that enable both the instructors and students the ability to access information, to study, and to communicate irrespective of time and their physical location. Blended learning is used to refer to the use of ICT to engage students and to enrich the quality of the student experience through interactive learning activities, particularly with the aim of achieving learning experiences not able to be realised through only face to face learning. In addition to VLEs, blending technologies is evident through adult learning institutions, particularly Universities, adopting infrastructure to support Learning Management Systems (LMS), Local Area Networks (LAN), Learning Management Content Systems (LMCS), and Virtual Learning Environments (VLE). In relation to these emerging frontiers of learning online, research is needed to accompany this adoption to inform effective teaching and learning practices.

Following discussion of those eLearning environments, this chapter will suggest that the limitations of those digital systems is leading to the next phase with the development of Digital Ecosystems conceptualised as learning platforms which keeps learning central, enables interoperability, and forms a base for building upon through use of new technologies and increased capabilities of educators to use ICT for curriculum, pedagogy and assessment (Ingvarson & Gaffney, 2008). This chapter will argue that digital ecosystems enable the integration of student administration, LAN (requiring teacher and student logins and passwords), VLE, content repository, community links, utilise Web 2.0 (social networking) technologies, and can have the adult learner as the central focus of the design of the platform and its functionalities.

Subsequently, the chapter draws upon the findings of a research project (Sun, Tsai, Finger, Chen, & Yeh, 2007) which identified the critical

functionalities for eLearner satisfaction to provide suggestions that the architecture and design of an eLearning system should be informed by the adult learners' perceived usefulness of the system (Pitnuch & Lee, 2006). Emanating from the discussion of new eLearning environments, including blended learning in terms of their possibilities and limitations, and the presentation of the critical functionalities for eLearner satisfaction, implications for adult learning will be presented.

Emerging Frontiers of Online Learning: Emerging Digital Ecosystems

In Australia, strategic considerations for developing the ICT infrastructure for online learning have led to a rich range of professional development and conferences which have responded to calls by educational leaders for guidance and a framework for learning at all levels and in all schooling sectors. For example, the success of the *Leading a Digital School Conference* held in 2006, has been followed by further annual conferences in 2007, 2008, and this is now a key event on the Conference calendar in Australia. The first *Leading a Digital School Conference* resulted in the publication of the book *Leading a Digital School: Principles and Practice* (Lee & Gaffney, 2008). Of direct relevance to this chapter is the work presented by Ingvarson and Gaffney (2008) on developing and sustaining the digital education ecosystem. The framework presented by them can inform adult learning, as educators continue their search for effective learning platforms. The following discussion draws upon their development of this framework.

Ingvarson and Gaffney suggest that a more detailed history of VLEs is provided in Wikipedia (http://en.wikipedia.org/wiki/History_of_virtual_learning_environments), including the early development of computer-assisted learning, followed by learning management systems (LMS), and the refinement of these resulting in learning content management systems (LCMS) and the parallel emergence of the 'open standards' movement in response to the lack of interoperability experienced in the LMS. They indicate that the LCMS present difficulties for educators as they tend to be "complicated and labour-intensive, requiring staff dedicated to managing the content" (Ingvarson & Gaffney, 2008, p. 148). Intranets and Local Area Networks (LAN), requiring passwords and usernames are now commonly used by educational organizations to develop and share learning resources. They predict that these will continue to be a key architecture for VLEs.

A more recent drive for change has seen the development of VLEs which are "less didactic, more open application of digital technology, which is more directed at learning and less about management and control" (Ingvarson & Gaffney, 2008, p. 149). Adult learners need to build resourcefulness and capabilities to become self-directed and self-managed learners who can pursue different, pathways for knowledge creation, rather than following a linear model characterized by command and control by the teacher. For example, Husband (2008) refers to wirearchy as "a dynamic two-way flow of power and authority based on information, knowledge, trust and credibility, enabled by interconnected people and technology" (p. 1). Husband argues that:

"The last thirty years have been about the building of the technical infrastructure that provides an interconnected world. The integrated platform for a transformation to economies and a world driven by the communication and exchange of information is now solidly in place. The next fifty years will be about learning how we will behave in an interconnected world and workplace". (Husband, 2008, p. 1)

From experiences of implementing VLEs, educators have realised that there are advantages in connecting student information systems with the online learning environment. According to Ingvarson and Gaffney (2008), the consequence was that educational leaders and systems introduced

interoperability between student management systems and the administration systems, and overcame the division between school administration infrastructure and classroom learning systems.

What is the emerging online frontier? Ingvarson and Gaffney predict and provide examples of the emergence of digital ecosystems, such as Blackboard (Blackboard, 2009), Moodle (Moodle, 2009), Drupal (Drupal, 2009), SharePoint (Microsoft, 2009), and D-Space (D-Space, 2009). In e-commerce, the Cisco-led Information Age Partnership study (cited in Directorate General Information Society and Media of the European Commission, n.d.) conceptualised the progression towards digital ecosystems as follows:

1. Email – for effective internal and external communications
2. Websites – for visibility in the global marketplace, and for the diffusion and gathering of information
3. E-Commerce Tools – for ordering and paying online, for reducing transaction costs, and to maximize accessibility to new markets
4. E-Business Tools – for supply chains integration, realizing value in the supply-chain integration, and reducing costs
5. Environments for Networked Organisations – for outsourcing, for enabling new business models, and virtual enterprises
6. Digital ecosystems – for global dynamic connection and aggregation of businesses, sharing of knowledge, ideas, and capacities, and spontaneous selection and evolution among services and solutions

In an increasingly digital, networked world, these ecosystems need to enable learners to ubiquitously engage in connected ways characterised by interoperability between the VLEs which are usually managed systems and systems outside of those environments so that the learning platform can integrate aspects important to learning, such as the adult learner's home, work, and their formal education. According to Ingvarson and Gaffney (2008), 'healthy' digital ecosystems "can provide a more responsive, personalized, effective, equitable and efficient learning experience for each student" (p. 152). This vision of healthy digital ecosystems remains elusive at this stage, and unless the way they are designed and informed by educationally sound rationales to justify what they are attempting to achieve,

> we may end up wasting resources and developing 'sick digital ecosystems' that contain the pathological entities intent on undermining the vision and culture of the school or system. Examples of the latter would include…applications that…control processes or performance with no appreciable benefit in effectiveness, efficiency… for staff and students. (Ingvarson & Gaffney, 2008, p. 152)

This raises the question – what are the characteristics of a 'healthy' digital ecosystem? The World Economic Forum (2008) identified 8 key areas or pillars that are core for a healthy digital ecosystem; namely, innovation, value of intellectual property rights, financial and legal structure, security and privacy, individual liberty, access, education and civic engagement. To elaborate, as examples, the pillar of innovation reflects an education system that fosters innovation, the individual liberty pillar means that individuals have the ability to communicate, interact and share content, while the pillar of access means that

Table 1. Themes and pillars of a healthy digital ecosystem (As proposed by World Economic Forum, 2008)

Themes	Pillars
Economic	• Innovation • Financial and Legal Structure
Personal	• Individual Liberty • Security/Privacy
Social	• Access • Education • Civic Engagement

there is an infrastructure that provides ubiquitous, pervasive, simple, affordable broadband structure. The eight pillars can be grouped to reflect their emphasis on economic, personal, and societal values as shown in Table 1.

The following section discusses blended learning approaches used in conjunction with networked learning environments can minimise the likelihood of 'sick' digital ecosystems.

Blended Learning Approaches

The adoption of blended learning approaches in adult learning uses ICT in ways which involves integration of different modes of delivery, models of teaching, and styles of learning through strategic and systematic use of technology, combined with the best features of face-to-face interaction. In this way, blended learning can include varying levels of ICT use ranging from mainly face-to-face to fully online teaching. This expands the conceptualisation of eLearning to enable educators to make design decisions based upon the relative advantage of the ICT for more creative and effective learning and teaching. This position is well described by Eklund et al. (2003) who stated that:

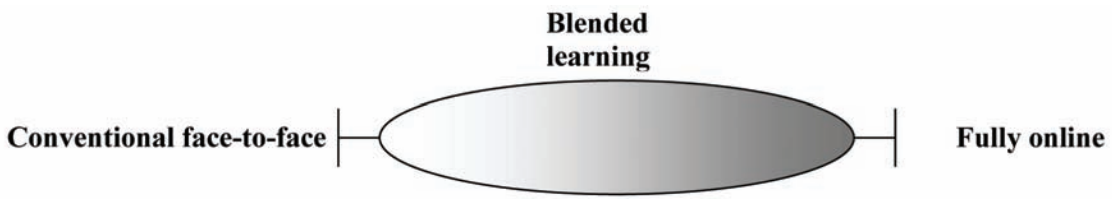
> The growing trend to blended learning recognises the use of ICT in the instructional process as one that augments rather than replaces face to face delivery, and provides unique experiences that assist in achieving desired learning goals. Continually changing demographic profiles for consumers of e-learning imply the need to adopt a user centred design process for development projects, rather than use an off-the-shelf or templated solution, and underscore the importance of developing processes and skills rather than product. (Eklund, 2003, p. 4)

An example of blended learning is the approach used at Griffith University in Australia, as visually shown in Figure 1 below, which is "best understood as spanning a continuum that covers a wide spectrum of activities between conventional face-to-face interactions and those that are fully online" (Griffith University, 2008b, p. 1). The key principle is that pedagogical decisions can be made for a blend of face-to-face and online approaches depending on the needs of the learner. The implication for adult learning is that the learning space, design and delivery can be informed by the needs of the adult learners to enhance effective learning outcomes.

According to Griffith University (Griffith University, 2008b), blended learning brings together face-to-face classroom experiences with creative uses of existing and emerging technologies to:

- make learning content and experiences more accessible for students;
- cater for student diversity in terms of background, learning styles and preferences;
- create dynamic communities of inquiry;
- enable real-world learning through simulations and interactive online environments;
- foster closer connections between classroom and work-based environments;
- enhance the quality of research-based learning by enabling students to access online databases or international research communities; and

Figure 1. ***Blended learning continuum*** *(Griffith University, 2008b, p. 1)*



- internationalise the curriculum through enhanced connections to international learning communities, resources and opportunities.

The planning considerations for blending learning involves decisions about blending time, blending the locus of learning, blending pedagogical approaches, and blending learning and assessment approaches. In essence, blended learning opens up the range of curriculum, pedagogy and assessment approaches which can suit the needs of the course being taught, the needs of the adult learner, and transform the restrictions usually associated with adult learning. For example, blending pedagogical approaches enables choice ranging from knowledge being provided in one to many large face-to-face lectures, to podcasting of those lectures to enable learners to revisit the presentation at a time and place of their choosing, including for just-in-time purposes, for further in depth study of the topic, and for examination preparation. In this way, traditional didactic large class lectures can be transformed to meet diverse, individual adult learner's needs.

Similarly, this conceptualisation of blended learning, through being situated within a digital ecosystem links learning materials usually available through LAN, LMCS and VLEs with student administration systems, assessment records, and the adult learner's personal use of ICT, such as social networking using Facebook, Bebo, or MySpace. Importantly, the choice and design of the eLearning functionalities – e.g. podcasting, online discussion forums, wikis, blogs, simulations, wireless, netbook and laptop technologies – are able to be determined by the educator, rather than determined through a technological determinist approach which focuses on the technology. That is, learning is foregrounded, rather than the technology, to achieve the best possible learning experiences and outcomes. Blending learning decisions informed by educational considerations, enabled and enhanced by appropriate learning platforms can provide a healthy digital ecosystem for adult learners.

Critical Factors Influencing eLearner Satisfaction

As indicated earlier in this chapter, there has been considerable enthusiasm for eLearning evident in many adult learning situations. However, it seems that this has not always translated to effective learning. There had been assumptions, particularly from those in management and administration within learning institutions, that providing learning materials online would result in economic efficiencies, as well as assumptions that both instructor and learners, would find the online experience highly satisfying and conducive to learning. In an instructive study of the critical factors influencing eLearner satisfaction, Sun et al. (2008) revealed that the initial enthusiasm is sometimes displaced by subsequent non-use of the eLearning delivery. They undertook an extensive review of the related literature and concluded that:

- Failures have been reported (Arbaugh & Duray, 2002; Wu et al., 2006);
- Little is known about why some users stop their online learning after their initial experience; and,
- Information system research clearly shows that user satisfaction is one of the most important factors in assessing the success of system implementation (Delon & Mclean, 1992).

In addition, Sun et al. (2008) in their review noted that in an eLearning environment, several factors which could be categorised into six dimensions had been found to account for eLearner satisfaction - student, teacher, course, technology, system design, and environmental dimensions (Arbaugh, 2002; Arbaugh & Duray, 2002; Aronen & Dieressen, 2001; Chen & Bagakas, 2003; Hong, 2002; Lewis, 2002). However, Sun et al. (2008)

warned that the findings were primarily from descriptive or analytical studies, and therefore, further research was needed which undertook a more rigorous examination to provide guidance for designing online learning to improve eLearner satisfaction. With this guidance, the likelihood of success would be enhanced. This argument is reinforced by the study undertaken by the New Zealand Council for Educational Research (NZCER) (2004) which also examined the critical success factors and effective pedagogy for eLearning in Tertiary Education. That study holds implications for the design and implementation of eLearning for adult learners, and it noted the following trends:

- eLearning should not be a mass of online material for individual access without guidance on how to learn from it effectively;
- Courses involving eLearning need to be planned for, and grounded in an understanding of the roles of teachers and learners, of learning, and of how students learn;
- The role of prior knowledge in learning is critical and must be taken into account in eLearning design, and therefore, ongoing formative assessment is part of this;
- As the brain is a dynamic organ shaped by experiences, then conceptual links are reorganised through active engagement with information in various contexts;
- Learning is an active process, and is the result of carrying out particular activities in a scaffolded environment where one activity provides the step up to the next level of development;
- Learning needs to be meaningful to learners and they should be supported in developing the skill of relating new material to what is meaningful to them;
- Learners should be enabled to become adaptable and flexible experts in their own current and future learning;
- Learning takes time and effective learning practices enable learners to work with materials from a variety of perspectives while they become fully conversant with it; and
- Weaving eLearning into existing teaching and learning practices adds more ways for students to be actively and deeply involved with subject area materials. (NZCER, 2004, pp. v-vi).

As indicated in the earlier discussion of blended learning which aims to take advantage of ICT to improve learning and teaching in ways that are not available in face-to-face teaching situations, similarly, eLearning is accompanied by an expectation that 'better' ways of teaching and learning are made possible (Piccoli et al., 2001). However, the instances of this being quite the opposite evidenced by the failures has tended to be explained by problems with the technology dimension. For example, adult learners might complain that the technology didn't work, links didn't work, they were unable to access the material, and various functionalities of the system were too difficult for them to manage and use. It's of central importance for those technology dimensions to be appropriately provided, as interrelated problems occur when other dimensions are impacted upon by inadequate infrastructure. Similarly, where the technology dimension is appropriate, failures can result when other dimensions are inappropriately addressed. As elaborated upon in the following section, where there is a heavy reliance on the learner's attitude and efficacy in using computers, learning effectiveness might be limited if the adult learner has no prior knowledge and/or confidence in engaging online. That is, the learner dimension requires understandings of the learner's needs, skills, knowledge, and attitudes, for success to be achieved.

Implications for Adult Learning

Although online learning has advantages over traditional face-to-face education, the needs of

adult learners need to be considered. For example, adult learners who are undertaking formal study for the first time, might prefer face-to-face teaching to assist them in building their study capabilities. The design and failure of eLearning needs attention from management and system designers, as well as educators. Sun et al. (2008) noted that psychology and information systems research, while focusing on the technology, have identified important variables to inform enhanced eLearning success, including the technology acceptance model (Davis, Bagozzi, & Warshaw, 1989), and the expectation and confirmation model (Lin, Wu, & Tsai, 2005; Wu et al., 2006). Subsequently, six dimensions which impact upon eLearner satisfaction were identified by Sun et al .(2008) - student dimension, instructor dimension, course dimension, technology dimension, design dimension, and environment dimension. Furthermore, they reported that the six dimensions encompass thirteen factors, listed below. In relation to adult learning, we argue that these provide serious implications planning and implementation considerations, decisions and actions to enable eLearner satisfaction among adult learners; i.e.

1. Learner Dimension
   (i) learner attitude toward computers,
   (ii) learner computer anxiety, and
   (iii) learner Internet self-efficacy.
2. Instructor Dimension
   (iv) response timeliness, and
   (v) instructor attitude toward eLearning;
3. Course Dimension
   (vi) eLearning course flexibility, and
   (vii) eLearning course quality.
4. Technology Dimension
   (viii) technology quality, and
   (ix) Internet quality.
5. Environmental Dimension
   (x) diversity in assessment, and
   (xi) learner perceived interaction with others.
6. Design Dimension
   (xii) perceived usefulness, and
   (xiii) perceived ease of use.

The contribution made by the study by Sun et al. (2008), when conceptualised in conjunction with blended learning approaches, and emerging digital ecosystems, is an integrated framework which acknowledges the complexity and interrelationships of the six dimensions, and the thirteen factors which can assist in eLearner satisfaction.

DEVELOPING SOLUTIONS: CONSIDERING THE DIMENSIONS AND FACTORS FOR SUCCESS

To illustrate the possibilities of designing a blending learning approach, effective eLearning, and guidance for healthy digital ecosystems, case studies help to illuminate examples of practice. While there are limitations in the *generalisability* of case studies, these can be usefully drawn upon by others for them to consider the potential *transferability* of aspects evident in the case study to their educational context. Using the six dimensions and thirteen factors identified by Sun et al. (2008), the case studies can be investigated to examine those dimensions and factors which have been incorporated and contribute to success to inform the development of solutions in your contextual setting.

For example, Kaufman et al. (2008) provide rich insights into supporting eLearning through communities of practice, defined as "a persistent, sustaining network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history and experiences focused on a common practice and; or mutual enterprise" (Barab et al., 2002, p. 495). Kaufman et al. (2008) draw upon the work of Henri and Pudelko (2003) who conceptualise virtual online communities of

practice in terms of the goal of the community (from weak to strong), and in terms of the strength of the social bond (from simple gathering to a highly cohesive group). Therefore, *communities of interest* exist where the goal of community is weak, and the strength of the social bond is weak. As the strength of both increases, we find that there is a movement to a *goal-oriented community of interest*, and as further strengthening of both goal and social bond occur, a *learning community* develops. A *community of practice* occurs when both the goal of community and the social bond are the strongest. Kaufman et al. (2008) provides numerous case studies of emerging and developing online communities of practice. For example, Kaufman et al. (2008) uses the case study of Simon Fraser University's Co-op Program Community to illustrate that:

it is vital to implement design principles that allow for Co-op Community's own direction, personality, and enthusiasm to lead the way. The design is non-traditional in the sense that the community's organization and structure ere not predetermined, nor dictated by the developers.

…involves open and ongoing communication as well as offering support…

…In this way, the community's social support systems are designed to create room for growth and cultivation of the online space that allow members to play active roles in shaping its features. (Kaufman et al., 2008, p. 484)

That case study reflects the dimensions of the environmental and the design dimensions identified by Sun et al. (2008) discussed above. Specifically, the strength of the goal and social bond of the community of practice is determined by the perceived usefulness, and perceived ease of use (Design Dimension), and the learner's perceived interaction with others (Environmental Dimension). This example illustrates how the dimensions which influence eLearner satisfaction can be used as a framework for analysing aspects of online learning and blended learning in particular case studies. For example, what dimensions do you wish to use to guide your planning for a blended learning approach? In your current online learning contexts, which dimensions and factors guide your design and implementation? What dimensions and factors have you overlooked and consequently need addressing?

CONCLUSION

The key message is that the adoption of new and emerging frontiers of online learning, by themselves, do not guarantee success for adult learners. The challenge for educators is to make learning design decisions and actions which result in blended learning approaches based upon defensible educational rationales, to enable healthy digital ecosystems, and promote eLearner satisfaction. The undesirable alternative can result in learning which does not adequately meet adult learning needs and principles, are technology-centred rather than learner-centred approaches, and result in what Ingvarson and Gaffney (2008) refers to as being 'sick digital ecosystems'.

The chapter concluded by providing guidance to avoid failure, by providing implications for approaching the emerging frontiers of online learning to design effective learning for adult learners, by drawing upon the research undertaken by Sun et al. (2008) which conceptualised an integrated framework built around six dimensions - student dimension, instructor dimension, course dimension, technology dimension, design dimension, and environment dimension. Together with the eight pillars of healthy digital ecosystems proposed by the World Economic Forum (2008), namely, innovation, value of intellectual property rights, financial and legal structure, security and privacy, individual liberty, access, education and civic engagement, those dimensions can lead to successfully capitalising upon the potential of the emerging frontiers of online learning for adult learning.

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KEY TERMS AND DEFINITIONS

Blended Learning: Brings together face-to-face classroom experiences with creative uses of existing and emerging technologies.

Digital Ecosystems: Enabling the integration of student administration, LAN (requiring teacher and student logins and passwords), VLE, content repository, community links, utilise Web 2.0 (social networking) technologies.

eLearning: Refers to making information, knowledge, and resources available online with the focus on the learner and learning, often enabled by the provision of VLEs.

Information and Communication Technologies (ICT): Includes all technologies or tools that are used for communication and information retrieval purposes and which have a computer as a key tool e.g. computers, internet, software, email, digital cameras, mobile devices.

Virtual Learning Environments (VLE): Refers to web-based applications enabling learning 'anywhere' and at 'anytime'.

Chapter 2
Empowering Adult Learners through Blog:
An Australian Case Study

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ABSTRACT

New Web 2.0 technologies have been eagerly adopted by educators both for on-line and for face to face teaching. These relatively simple technologies have been found to be extremely effective for supporting teaching, for cultivating student creativity and student interaction with their peers. This chapter explores a specific example of such adoption by an Australian academic both within his home university (Australian Catholic University) and with groups of disadvantaged students seeking alternative paths to university entrance. Within the context of an overview of the emergence of this technology during the last two decades, this chapter explores the successes of this particular adoption, but also identifies problem areas and suggests pathways for the future.

INTRODUCTION

There has been a rapid increase in the use of Web 2.0 technologies (web-based collaborationware) in recent years (Tepper, 2003). Blogs, podcasts and wikis have been adopted by many online professional and educational providers and services (Richardson, 2006). These new technologies are relatively easy to use and offer new levels of interactivity and varying modes of connectivity. These properties thus account for both their popularity and proliferation. Because of this ease of use, these new technologies, if effectively deployed, offer new possibilities of learning and teaching (Williams and Jacobs, 2004).

Emerging in the late 1990s, blogs have become ubiquitous on the web (Barlow, 2007). They are web sites resembling personal journals that are regularly updated with individual entries/postings. They offer personal vignettes, can contain news items, photographs, audio and even video clips. More often than not they are used as a means to share opinions and views that the writer/blogger considers to be of interest. Research has emphasized its facility as

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a mode of publication and its attendant capacity for personal affirmation and empowerment, as well as its interactivity and scope for interpersonal sociability and collective bonding (Kaye, 2006). Not surprisingly, it has been claimed by some that blogging is a useful practice for the development of higher order learning skills, active learner-centred pedagogy, authentic learning and interactive learning communities (Oravec, 2003; Stiler & Philleo, 2003).

BACKGROUND

In this paper, we present a study in which an English Literature and writing unit was constructed around blogging activity. This unit was offered as a community and adult education programme in conjunction with a non-governmental organisation for adult learners (Australian Catholic University in conjunction with Mission Australia- The Clemente/ Catalyst Program for the Homeless and Disadvantaged). Adult learners, it is argued learn differently from young people (Knowles, 1990). For Knowles, effective adult learning practices need to incorporate the following: self-directed learning as the preferred model, capitalising on adults' experiences as a rich course resource, a problem-based rather than subject-centred approach and the importance of a social context for learning. As such, any courses developed must be flexible, incorporate choice (as to materials and subjects for study), involve self-expression and integrate learning with their experiences (Mason, 2006).

With these principles in mind, students in small groups were encouraged to set up and maintain a blog as a portfolio of their work. In the paper, we discuss the role of blogs in providing a social mechanism for the student body and also as an outlet for classroom and practical examples. We show that students have utilized the blogs creatively and interwoven their blogs with their personal stories. These have proved to be an extremely useful and an effective tool for the adult learners (McDrury & Alterio, 2003). We also consider the limitations of blogs and argue that a supported and pedagogical approach to blogging environments is needed for them to be effective. The paper concludes by proposing the development of a Personal Development Planning process that we argue will enable further development and empowerment of adult learners.

The paper now continues as a personal statement of the unit writer and teacher Michael Griffith who describes the evolution of his teaching practice with the arrival of Blogging as a new technology. First he describes his experimentation with Blogging in his mainstream university literature units, and then he describes the transfer of these insights to his work with homeless students at Mission Australia

BLOGGING IN UNIVERSITY LITERATURE UNITS

I am a teacher of traditional literature units (English, Australian, American) at Australian Catholic University (Sydney Campus) where I have been teaching since 1977. Since my early days as a teacher I have been trying to find ways of combining creative responses to literary texts with the more conservative critical approaches current in most contemporary universities. My own fascination with the ways in which the internet was providing a huge expansion of resources for literature students led me to experiment with blogging as a tool for stimulating students' writing. My choice of a particular provider for blogging was conditioned initially by the name *LiveJournal* which provided connotations of a Journal-like response to literature being taught and emphasized the idea of it being alive, current and available for others to see. Initially students were somewhat nervous about using this tool in a traditional academic university setting, but they soon discovered the enormous potential of this tool, both as a means of

publishing their budding creative responses to the literature studied and – perhaps most importantly for them- the way this tool immediately opened up their social horizons to the wider group as a whole. I recall my own uncomfortable days as an undergraduate in huge lecture halls where I knew no one, and where it took me the best part of a semester to get to know anyone well. My own students now were declaring that through *LiveJournal* they were getting to know people in their class quickly and that this was providing a safe and stimulating working environment, one that was nurturing the community of learners.

As a teacher I was using this space to interact with students, to stimulate their critical and creative responses to texts- outside the narrow band of the one-hour tutorial per week. I was also encouraging them to share their lives, in words and images, with the rest of the group. What this produced in the space of a few months was an avalanche of *LiveJournal* entries across all the literature units I was teaching- in first, second and third years. I actively encouraged students to wander through the posted list of student URLS (across all three years) to comment on each other's work and to make friends. I have been finding that this leads to an extraordinary cohesiveness amongst all my literature groups and that there have been some extraordinary synchronous outcomes. For example a second year group studying 19th Century Literature particular, have suddenly found through a *LiveJournal* entry from a student in third year that the issues dealt with in Shakespeare shed some real illumination on the work they are doing in second year on the work of Oscar Wilde.

Another key feature of this use of *LiveJournal* across the years has been the way in which more advanced, senior students, have - on-line - been able to help younger first students master the blogging technology quickly and demonstrate ways in which they can enhance their blogging site with images, or even how they might create kinetic poetry through utilizing a variety of .gif and other kinetic technologies within *LiveJournal*. Each semester, along with publishing a full list of all *LiveJournal* Literature participants at ACU, I have been publishing a short list of *LiveJournal* Academic Helpers. These are experienced students who show-case excellent *LiveJournal* skills and who are prepared to work with younger students to help them improve. The current list of LJ Academic Helpers include:

Marc D http://ghettoman7.livejournal.com/

Timb H http://the-judas-drone.livejournal.com/

Ros A http://roselie87.livejournal.com

Cand I http://aussielatina.livejournal.com/

Mich B http://michelle-brandy.livejournal.com

Shad N http://shadi-n.livejournal.com/

Just P http://jp-justme.livejournal.com/

Cam N http://costumecarny.livejournal.com/

Other important elements of my use of *LiveJournal* include the fact that I use my own *LiveJournal* as a way of stimulating continuing interest in the material taught in class. I provide specific suggestions for work to be done in *LiveJournal* (this is in addition to specific recommendations I may make to individual students) and I include photographs of my own personal activities and of group activities to stimulate interest and create a sense of inclusion:

http://michaelgriffith.livejournal.com

My own rules for *LiveJournal* have been shifting during recent years and I am more inclined to mark those sections of the *LiveJournal* that relate more specifically to unit content, allowing students at the same time the freedom to express themselves for the purposes of social networking. Here is an example of my current guidelines in a recent unit outline which reflects this shift:

WHAT IS *LIVEJOURNAL*?

LiveJournal is a space where you can grow as a writer, expressing yourself in whatever way suits you best. It is a space that allows you to

blend images with text and it allows you to share your experiences and enthusiasms with other students.

Similar to MySpace, *LiveJournal* is an on-line blogging site that for the purposes of this unit has been integrated by the lecturer into Blackboard.

TASK DESCRIPTION FOR *LIVEJOURNAL* ENTRIES

You are required to make at least one entry into your *LiveJournal* each week that reflects your experience of literature during that week. Give this entry the title "Literature Entry Week 1 (2… etc)". As a rough guide your weekly "Literature Entry…" should be around 150 words, but there are no restrictions on length.

The entry can be either creative or critical in its form. It should focus some attention on the text or the ideas that have meant something to you; it can also blend these reflections with your own life experience and with any images that you think are appropriate. There are no restrictions on other entries you may wish to post into your *LiveJournal*, but marks will be given to those entries that are headed "Literature Entry…"

As lecturer in charge I will be posting ideas for your literature entries in my own *LiveJournal* at http://michaelgriffith.livejournal.com

Assessment of this component will be based on your ability to use your *LiveJournal* as a way of extending, deepening and sharing your experience of literature studies at ACU. Assessment will be based on the quality, rather than the quantity of your content.

One of the key ideas that lay behind my implementation of this use of blogging was my sense that the old paradigm of a teacher instructing students by way of lectures and then directing them through a series of questions in tutorials needed to be challenged. A quote from the Parker Palmer's well-known book *The Courage to Teach* (2008) seemed to support the way in which I was intending to use blogging as part of a new teaching strategy. Palmer wrote:

If we regard truth as something handed down from authorities on high, the classroom will look like a dictatorship…. If we regard truth as emerging from a complex process of mutual enquiry, the classroom will look like a resourceful and interdependent community. Our assumptions about knowing can open up, or shut down, the capacity for connectedness on which good teaching depends.

The mode of knowing that dominates education creates disconnections between teachers, their subjects, and their students because it is rooted in fear. (p.51).

A resourceful and interdependent community is exactly what I sensed my lectures and tutorials were becoming -with the support of this new technology; students were being allowed to engage with each other, share their enthusiasms and critique each other's work.

Some of the early [unedited] responses to the uses of *LiveJournal* are listed here. They clearly support a number of the claims made earlier in this chapter.

- Karyn F http://karyn-lee.livejournal.com
- *LiveJournal* has greatly supported my learning in Literature for a range of reasons including reflective, creative and analytical thinking…I am also a student who does not speak too much in class and I find the entries a good way to present my progress.
- Jos Mhttp://josh-m.livejournal.com
- ... i have the ability with LJ to create more feeling with my responses through the use of colour text, images and the option of writing informally; opening the possibilities of language…the ideas that i put down in my LJ are very spontaneous, they provide a window into my true feelings at the time, there is no fear in my responses... It gave me a way to post my poetry to those others who would apprieciate it,

sorta opened the floodgates in a way cos befor i didnt think ppl would relate to my words...I bleieve that LJ is a great learning resource, it allows students to be who they are, and express their true feelings without the restraint of formality…

- Kar T http://karliefarlie.livejournal.com
- …. to express what I think Live Journal has done for me. Well, not really directly, but by facilitating conversation and by giving the opportunity to see what other people think and feel, I think you have done a lot for me my technologically created friend.
- Reading other people's blogs, has affected my in many ways. They amuse me, they enlighten me, they make me think about things, they are good for when I am procrastinating or when I'm just bored, but mostly, they give me the chance to appreciate my friends in a totally new light.
- I don't just love my friends because they are wonderful people, but I can appreciate their great writing and artistic abilities - I feel like I've been privileged enough to be able to see tiny portions of people's minds and souls. I hope that doesn't sound insane. I'm not sure how to express it though? I just feel like I respect these people on a greater level because I'm able to see the amazing things they think and express.
- Cam N http://camsheartsamber.livejournal.com

"I dont know where I would be today without live journal. It has become a part of my life."

LiveJournal Blogging with Homeless Students at Mission Australia, Surrey Hills

Late in 2006 the opportunity arose to teach literature units ("Introduction to Literature" and "Sacred Australia") to a group of homeless students through Mission Australia, Surrey Hills in Sydney. This was an initiative of a number of agencies, including Australian Catholic University, who – following in the footsteps of Earl Shorris in Massachusetts who began the Clemente Program, Social Transformation through the Humanities"

http://www.masshumanities.org/?p=clemente_course.

The Clemente program in Australia has been targeting the homeless and disadvantaged, providing them with humanities courses as a pathway to university entrance to ultimately to growth in esteem and reintegration with society.

The literature unit that I taught in both 2006 and 2008 incorporated *LiveJournal* as a tool for students to begin writing their own stories and poems and as a way for them to connect more intimately with each other, and- more importantly- with main-stream students on-campus at Australian Catholic University. The outcome of this effort has been astonishing in a few cases. Students have truly developed their creativity and have in fact acquired something of a following from the more traditional on-campus students who regard with awe the way in which people from severely disadvantaged situations have been able to rise above their circumstances. Three of this initial group of students have now finally made their way into the main-stream at Australian Catholic University and their path to the university was made easier, both because of their belonging to the ACU *LiveJournal* community and because of the original and dynamic stories they were able to share with on-campus students.

Van a former heroin user, through *LiveJournal*, published his life story and poetry which earned him respect. One of his most powerful poems can still be seen on his *LiveJournal* site http://johannes123.livejournal.com/2006/04/25/

Here is my poem that Michael requested from us in class on Wednesday. It sounds really corny I think but inspiration was lacking. So here goes.....

BETTER DAYS

Ive lived so long as another man
Never really knowing who I truly am.
Through clouded horizons I never could see,
from tumultuos storms I would ever be free.
A child of abuse and a victim of crime.
A life on the edge and a doer of time.
Locked into behaviour I could not repel
Believing you make your own bed where you dwell.
From parties to prisons and pill packs and more,
syringes and pot pipes were all I'd adore.
And never a Searchlight and never a kiss,
Could peirce the veneer of my protective bliss.
And now in my midlife something strange I detect,
A shifting perspective on which I reflect.
A new man is growing, a spirit emerging,
Guided invisibly by a hand so encouraging.
Oh my soul now awakened Oh how I rejoice,
I lean in, you whisper and I hear your voice.
The elements conspire and weave in me strength,
Building foundations that give my days length.
Now hope is a banner that covers my sky,
Over fear and resentment I've learnt how to fly.
Though I tremble and stumble I still find my way,
To the centre of peace I now find in each day.

Well there you have it and I hope you all enjoy it. I look forward to reading any comments that you may have on it. I have tried to make comments on some others journals but I am doing something wrong in the email department that I can't work out so I will have to talk to Michael tomorrow.

Another young woman, Nis, who has had serious health issues and found herself on the streets has now, through the Clemente program, enrolled in a full time Arts Degree at Australian Catholic University. Her *LiveJournal* has flowered into quite an astonishing creative work in its own right. The contents – text and images- can be viewed at http://anissa-c.livejournal.com

One of her most creative moments in response to Shakespeare can be found at, http://anissa-c.livejournal.com/44443.html?

Herd, is another student who has fallen on hard times but is now transforming his life through his poetry and prose being produced in *LiveJournal* in conjunction with the "Introduction to Literature" unit he is studying on-campus at Australian Catholic University. His work can be viewed at

http://herdinator.livejournal.com

In a recent *LiveJournal* entry in my own *LiveJournal* I mentioned for the benefit of all my students how *LiveJournal* was serving the interests of the wider community, helping new learners outside the walls of the university to feel that they were part of a growing interactive community. This can be seen at http://michaelgriffith.livejournal.com/72068.html?view=132228

One Clemente student who I had taught at Mission Australia and who has now "graduated" into University, used *LiveJournal* to reconnect with me on campus and to celebrate his learning experience so far. Shine wrote, (this can be viewed at the bottom of the previous entry):

Hello Professor Griffith,

As one of the former Clemente students. Now a fully fledged ACU student, I just want to say thank you to yourself and the rest of the staff at ACU for making me feel so welcome.

FYI I have enrolled in THEO128 - GOD FAITH & SEARCH FOR MEANING.

Although I'm not in any of you classes this semester I hope to drop by one of your lectures at some stage (if that's ok) I'll also be hanging around MAC [Mission Australia Centre], this semester to take advantage of the Learning Partners.

A special thank you, to you also MG for making my first Clemente experience so enjoyable and memorable. If not for your compassion and understanding during my time in your "Sacred Australia" unit I wouldn't have continued with the Catalyst Clemente Program. I look forward to running in to you around campus.

The recent, 2008, crop of Clemente (Mission Australia) students have also demonstrated clearly how the opportunity to write creatively and personally for an audience made up of their peers can lead to some astonishing creative breakthroughs. This is of course assisted by the response these students receive from students on-campus at Australian Catholic University who view with real interest the creative evolution of these disadvantaged students. One such student this year was Jerry who produced an amazing poem about what it was that had restricted his life in childhood. The poem received a bundle of enthusiastic responses from students both within the Clemente unit and from University campus. These comments can all be read a the end of his extraordinary poem at http://dallymessenger.livejournal.com/

Here is the unedited opening stanza of Jerry's poem:

Sep. 24th, 2008 at 5:09 PM
i never knew my father well
he was allways there, as if i could tell
his brutality was an inhearted one
passed on & on from father to son
he worked hard night and day
at least thats what he would say
to put some food on our plate
but all I needed was a freind a mate
the things he gave me were important ones
lessons of life that seemed so dumb
he never looked in side of me
to see the things that i could see
a life of youth with reason to fight
but never quite finding that distant light
Your stupid stupid stupid & dumb
thats what I;ve got for a son

Another young man, Maty, in the 2008 unit had suffered from chronic depression. He was amazed to discover his own creative talent when prompted to write poetry about his immediate experience. He wrote about his periods of depression and then found these alternating with poems about his moments of joy: http://mattyd2.livejournal.com/

Here are two of his poems:

"Dark Daze" by Maty
Darkness awaits within
Black cave
Pit of despair
Cringing
Vibrating
Colour without light
Fear but no flight
Cowardly heroic
Dryness
Parched
Can taste
Nothing but ashes
Climb the depths
Reality
Terror
Horrid necessity
Face what's hated
Day by day
Living
Paradox
Comes by surprise
Attacking the core
Positivity destroyed
Frozen
Momentous
Enforced negativity
Brought from history
Destructive intentions
Clinging
Fighting
Is this life
Is it fate
Is it the Human Condition

Then shortly after a fishing expedition with his "old man" he wrote:

"Dancing Dolphins" by Maty
Three miles out to sea
Been wettin the lines
Trying to catch what is free
On the shore the distant pines
Sing a story like clemintine's
Sparkling bright the great blue wonder
A glorious day, the fish on the bite

This gives me a beautiful time to ponder
There is peace to be had, on the ocean's light
Hoping the big feller will put up a fight
Not much happening as we bob up and down
As I peer intensely into shimmering haze
They came towards us with never a frown
Dancing through the wandering wave's
A joyous sight in an awestruck gaze
Together they frolicked around the boat
An intricate tango, innocence and tease
Flying, prancing, dancing too happy to float
He looked me in the eye, I felt a release
With Dancing Dolphins I had found inner peace!

Maty concluded his *LiveJournal* with the following summary of how he had found the process of blogging as part of his learning:

Last Entry for Literature

Nov. 21st, 2008 at 2:47 PM

The last 12 weeks has been one of the best experiences of my life. Through this introduction to literature I have been exposed to poetry, prose and drama for the first time in my life. It has open my mind and more importantly my spirit to an art form that I thought I would never understand let alone be able to do.

The ability to write, particularly in the form of poetry, has opened a whole new world to me. I have been influenced by all the poetry that I have read and I have learned that not only is poetry an art form but that more importantly it is an educational tool. Jack Davis in "Urban Aboriginal" had a deeply profound affect on my emotional state, causing me to feel guilt and shame at what my ancestors had done to his people, as well as telling the story of what the Aboriginal people went through. A beautifully written piece of art and very educational at the same time, this shows me that literature has profoundly affected my life not just educationally and emotionally but also spiritually.

Overall with the variety of of readings that were offered, with the differing styles of poet's from Yeats to Shakespeare I have been given a gift beyond compare. I am grateful to have been exposed to literature because it has given me the ability to express myself in ways I never thought possible. I now write every day, mostly poetry, although I try prose as well. Through my poetry I have been given the opportunity to have the benefit of healing from my past experience of life as well as a chance to educate people so hopefully they do not have to go through what I have, the brutality of addiction. Today I am clean and sober, recovering from a life of pain and misery, now I able to tell my story though an art form that I have come to love.

It has even got me thinking that in my future that I will need to have this as a part of my life, quite possibly as an english teacher or something even deeper. I will always continue to write and read poetry now and there will be more entries in this space. I simply cannot stop writing. I will ever be grateful to MJ for his encouragement and support, I am especially gratefull to those classmates of mine at the Clemente program, whose feedback and support have been outstanding, not to mention how good their work is (puts mine to shame). I am filled with a kind of joy and love for those who have helped me on my journey through literature and I will be eternally gratefull to them..... Watch this space!!

maty xoxo

During the teaching of all these literature units it became apparent that the core teaching content increasingly became the disadvantaged students' own writing rather than the set literature texts by known authors. This became a powerful way of reinforcing the confidence of these students and teaching them the elements of literature and of effective creative writing. The way this was implemented was by projecting the best *LiveJournal* entries in any given week onto a screen and calling for class comment and interaction. All the key aspects of textual analysis could be taught this

way, along with an immediate engagement with the direct joyful, sometimes painful, experiences of those in the class.

CONCLUSIONS AND FUTURE TRENDS

While this chapter has celebrated the successes of blogging in both a conventional university setting and in an outreach program some of the difficulties of sustaining this kind of teaching need to be addressed. Firstly, there is the issue of spending time teaching disadvantaged students the basic computer skills to access a blogging site, creating an email identity and remembering all the associated passwords. Then there is the problem of computer access and giving time to assisting them to actually write their entries when they come to class. Most of these students do not have their own computers and have limited access at the Mission Australia headquarters. Next there is the real issue of supporting their work immediately and of drumming up support from other sources. I had to encourage my on-campus students to take part in this interactive process and I had to sit long hours with some students to create in them a confidence to write from their own experience. But once these initial issues had been tackled the unit more or less began a steady "sail" into the open seas.

What is needed to further support a program like this is what we might call a Personal Development Planning process that could pedagogically underpin such utilization of blogging in higher education that has been described in this chapter. Such planning could include: a more coherent strategy amongst educators within and between higher education institutions to explore the ways in which this and other radical new teaching technologies do in fact serve the learning experience and empower the learner with new skills, hitherto not available. This might lead to more systematic peer appraisal by other educators in the field, of the effectiveness or otherwise of teaching and assessment practices surrounding the use of blogging. This could be achieved through a sharing of experiences and practical ideas through on-line and face to face conferencing. At all events technology in this instance has forged the possibility for a powerful new adventure in teaching and learning. It now requires a concerted and co-ordinated program to bring it to maturity. This chapter is one step in the direction of this collaborative effort.

To conclude with another pregnant insight from Parker Palmer's *The Courage to Teach* (1998) a book powerfully relevant to the new uses being discovered for technology in university teaching:

… to teach is to create a space in which the community of truth is practiced - I need to spend less time filling the space with data and my own thoughts and more time opening a space where students can have a conversation with the subject and with each other… (p.120).

NOTE

All names used in this article –except the authors- are pseudo fictitious. Students were also asked to create an on-line pseudonymn that masked their true identity.

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Chapter 3
Perspectives on the Realities of Virtual Learning:
Examining Practice, Commitment, and Conduct

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ABSTRACT

Thought-provoking awareness and reflection often initiate meaningful discourse and positive models for change. Globally diverse practitioners teaching online courses may benefit from examining how online practice, commitment, conduct, and standards can affect teaching, learning, and the adult student experience.

INTRODUCTION

Online, virtual, web-based, or computer-facilitated education has opened doors to intellectual inclusion for adults who are often excluded from participating in formal education, professional development, and training programs. Nontraditional students seeking advanced scholarship or career development opportunities are increasingly attracted to the convenience of online study and discover online education is manageable in conjunction with life's commitments.

Virtual classrooms command respectful communication between people who will likely never meet face-to-face. Interacting as global strangers necessitates individual disclosure and reciprocal information sharing. Considering worldwide surges in identity theft, online peers often wonder how secure personal information is when revealed in controlled but vulnerable spaces. Implementing security and privacy protocols help to protect online participants from Internet intruders.

Monitoring course quality encourages instructive integrities and delivery of exemplary online curricula. Because emerging theories and technologies quickly change educational landscapes, regular updates are needed to ensure learning materials are fresh and relevant. Without monitoring and periodic evaluation, online classes may not reflect institutional or best practice ideologies and fall short in fulfilling the needs of adult students.

Without personally engaging in the online

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student experience, it is sometimes difficult for instructors to understand the impact alternative methods of curriculum delivery, interpersonal communication, and behavior has on adult learning. This chapter may serve as a catalyst for instructor awareness, critical reflection, meaningful discussion, and positive change.

BACKGROUND

Learned societies are borne through access to education, reference libraries, and diversely insightful dialogue. The Internet has revolutionized learning for citizens with access to the World Wide Web. Numerous estimates indicate that over 20 million people use the Internet daily for research activities, entertainment, education, and communicating with others.

Emerging educational trends support worldwide expansion of online degree and professional development programs. According to Merriam, Caffarella & Baumgartner (2007), "more dollars are spent on adult learning and continuing education programs than elementary, high school, and post secondary education combined" (p. ix).

Adult learners often participate in education and training courses to increase employment opportunities, "deal with changes in the stages of adulthood" (Dominice, 2000, p. 49), boost personal esteem or to realize a childhood dream. Online courses greatly benefit students who desire flexible scheduling, self-paced learning, and are especially invaluable to students who cannot be present for on-campus courses.

Although Dewey theorized that "all genuine education comes about through experience" (Dewey, 1938; Merriam, Caffarella, & Baumgartner, 2007, p. 162), reporting objective evidence is often preferred over relying on subjective experience. Existing research and discussion suggests that most faculty members, researchers, instructors, and interrelated online education experts have never taken a graded online course as an adult student learner. Never having a personal online learning experience may disadvantage instructors of adults. As part of teacher training and professional development programs, adult educators may benefit from taking graded courses in actual or simulated online learning environments.

Adult learning theory demonstrates that teaching adults is facilitated through integrating course content with real life experience. Reciprocal acts of equality, honesty, and respectful communication are valued in learning communities. Inclusion, positive feedback, and sincere praise build confidence and encourage reticent students to participate.

To gauge student learning, course effectiveness often warrants institutional e-Learning performance assessments. Courses transferred into learning management systems (LMS) that don't convert well into online formats may provide students with an unintentional but inferior scholarly experience.

High instructional competencies elevate the reputation of institutions offering web-based outreach and training. Existing literature chronicles thousands of 'what *to* do' suggestions on becoming an accomplished online instructor. Notable is the e-Learning Guild's, *834 Tips for Successful Online Instruction* collected from diverse member practitioners or "tipsters" (December, 2005, pp. 65-70). To educate, uplift, and empower everyone involved in online education, adult educators may benefit from critically reflecting on real life 'what *not* to do' narrative. Educators and professional training specialists may regard the experiences and mistakes of others as valuable tools for learning and improvement.

The Business of Adult Learning

Adult pedagogy, sometimes referred to as andragogy, builds on assumptions that adult learners routinely create meaning by combining coursework and life experience with practicum. As a result, self-directed learning has become "a

highly researched adult education topic" (Merriam, Caffarella, & Baumgartner, 2007, p. 128). Transitioning from teacher-directed to student-directed learning transforms traditionally student-dependent teachers into course facilitators for adult students actively contributing to learning and scholarship.

Brookfield (1995) argues that critically reflective teachers recognize study courses don't merely "happen" but "arise from individualized preferences and conflicting interests" (p. 40). Web-based instructors demonstrate outstanding leadership skills and are (a) technologically competent, (b) committed to lifelong learning, and (c) willing to challenge the status quo.

Exemplary online courses include:

- quality curricula and instructors
- a welcoming online classroom
- curriculum designed to capitalize on adult life and professional experiences
- opportunities for creativity and open debate
- online discussions derived from readings and student-posed questions
- interactive assignments
- interesting and well functioning links to current research, resources, and supplementary exercises
- high levels of organization and trust
- punctuality
- timely responses to student inquiries
- instructor-student communication comparable to face-to-face
- multimedia presentations
- recorded mini-lectures

For instructors and training specialists, the absence of personal online experiences can initiate unrealistic biases and expectations. It is a mistaken belief that online courses require less instructor involvement and virtually teach themselves. When specific components of existing face-to-face courses do not play well online, instructors must revise, redesign, add curriculum or reinvent existing courses to effectively present complex subjects. Moreover, increased demands for immediate response to student inquiries can extend virtual office hours and the work week.

As with traditional courses, online assignment and deadlines must be met but, otherwise, students are in control of their surroundings and study schedules. Successful adult learners must develop positive self-concepts and self-actualizing behaviors that encourage them to "reach out toward the environment with confidence [and trust] that the interaction will be productive" (Joyce, Weil, & Calhoun, 2004, p. 291).

Online courses are often perceived as less rigorous than seated courses—an assumption that may or may not be accurate. To balance life with learning, successful online learners develop advanced time management and independent learning skills. As required in traditional or on site courses, online students must also schedule quiet time for study, be mindful of ongoing deadlines, produce quality work, and perform well on timed exercises.

The Instructor-Student Enigma and Trust

Replicating the face-to-face learning experience in computer-mediated environments requires personal disclosure to and interaction with global strangers. Adult students devote time, money, and energy to online learning often under the direction of an unfamiliar person with whom they may never speak beyond message boards and through e-mail correspondence.

Course design, construction, and execution must be flawless. Instructors jumping into the deep end of the pool without possessing the skills and technological competencies to manage online programs may create confusion and decrease course credibility.

Mutual trust is a critical to all learning environments. A hint of dishonesty or impropriety can

damage an adult learning community by weakening teacher-student bonds. Although institutional policies governing conduct are applicable to instructors as well as students, teacher integrity is presumptively gauged at the highest levels.

First-Time Online Learners and Communication

Competencies begin with "understanding the context in which communication occurs" (Martin & Nakayama, 2004, p. 418). Theorists suggest that "much of popular culture tends to minimize the challenges associated with the communication process" (Dainton & Zelley, 2005, p. 1). Communication facilitates teamwork and "structural outcomes including individual, instructor, and group goals in addition to authority relations, roles, communication networks, and climate" (Littlejohn, 2002, p. 300).

Learning adults dread the possibility of self-humiliation in public spaces. First time adult students frequently express trepidation about participating in new and unfamiliar learning environments. Through research, Lemme (2006) states that "self-esteem buffers anxiety in response to threat" (p. 85). To promote student confidence and decrease anxieties, the following course statements are offered for guidance and support:

To First Time Online Students

For adult learners, anxiety and intimidation often accompany decisions to study as a novice in an online classroom. If you are one of these students, what you are feeling is shared by many first time online learners. Taking an online course is fundamentally the same as taking a face-to-face course but without faces. Please relax and try not to worry!

Computer Technology & Software Literacy

Navigating through an online course management system requires basic computer skills; you are not expected to be a computer technology expert. You are welcome and encouraged to contact instructors with questions not covered in the online course tutorial.

Practical Advice

It may take a couple of weeks to develop confidence in your online abilities. Anxiety is a normal response when facing the unfamiliar so please don't allow anything to intimidate you or disrupt your learning.

Saving assignments on a plug-in USB, external hard drive, or CD is suggested. Not saving or making copies of coursework files has created tremendous grief for many students. As we all know, computers can make everything disappear without notice or cause.

If you are concerned about losing discussion board postings, type your comment in Word and, then, copy and paste it into the online textbox. Then, if you experience a computer malfunction, you still have a copy of your original message.

Acronyms

When using industry-specific professional, organizational, institutional, or other acronyms, write them out at least once at the beginning of discussions so everyone is included and understands the context of your reference.

Pop Culture Communication

Although cultural savvy is important, online learners must examine the manner in which communication styles represent scholarship. With the absence of nonverbal cues, online participants often revert to computer constructed icons, or 'emoticons,' and

Internet lingo (e.g. 'lol' for 'laughing out loud') to clarify the context of written messages. Less savvy adult peers may be disadvantaged when called upon to decipher the meaning of computer generated pop culture symbols and expressions used to convey tone and mood. Briefly explaining meaning or feelings in writing is inclusive and better received.

Discussion Board

The discussion board is a place for students and instructors to virtually interact as academic cohorts. Participants must be thoughtful and respectful in their responses to posts that may differ from their opinions and philosophies. Choreograph your words to reflect critical examination of course issues. Always avoid personal attacks, insults, demeaning responses, and any form of academic or personal intimidation.

Plagiarism and Copyright Concerns

The use of another person's ideas, writings, manuscripts, dissertations, web page content, exams, concepts, language, text, or theory and passing it off as your own without acknowledging or giving credit to the original author is considered plagiarism. We live in a cut-and-paste, drag-and-drop culture but cutting and pasting text from online documents or websites into assignments and presentations is forbidden.

Plagiarism is a serious infraction punishable by failure and expulsion from academic or training institutions. Cutting and pasting photographs, artwork, or adding other copyrighted media to your document or presentation without the copyright owner's written permission may constitute violations related to intellectual property, ownership, and copyright laws.

At its finest, plagiarist acts are deceitful and clearly detrimental to your academic progression and reputation as a scholar or working professional. Faculty members, instructors, administrators, publishers, managers, authors, students or any person stealing the intellectual property of another person without attribution is subject to misconduct policies and applicable laws.

Privacy

Although the Internet is a public space, online courses are not. Identifiable information, personal anecdotes, and declarations shared in academic spaces are strictly confidential. Students are cautioned not to post anything about themselves or others they would not want published in a public domain or distributed freely to a worldwide audience. Because of privacy rights and identity theft, personal information about students or professional peers cannot be shared with anyone outside the course.

Conduct and Perception

In nontraditional classrooms, confidence-building acknowledgment and sincere praise are cornerstones for success. "Experience is not just a matter of what events happen to you; it also depends on how you perceive those events" (Hughes, Ginnett, & Curphy, 2006, p. 49). How do you perceive the following?

Scenario 1:*An online instructor returns graded essays to English-speaking students translated into the native language spoken in the country where the instructor received a doctoral degree.*

Reflection: Could the instructor's action be construed as suspicious, an honest mistake, or an attempt at plagiary?

Scenario 2:*On a course discussion board, a student openly discusses allowing unauthorized course outsiders to participate in online course exercises. Through a registered student an online instructor gains access to another institution's course activities as an unregistered nonpaying outsider.*

Reflection: Could outsider activities performed within secure online learning communities

constitute breaches of privacy and be potentially contributory to identity theft?

Scenario 3:*After students are asked to post personal photos as part of an online profile, students ask the instructor to reciprocate so they can also view a relatable image. The instructor responds by posting the photo of an animal.*

Reflection: How might adult students interpret this action; could it negatively impact the learning community?

Scenario 4:*Without explanation, students wander aimlessly through cyberspace for days waiting for introductory instructor contact, a class welcome, course information, and belated instruction.*

Reflection: What message might this inaction send to students: A lack of interest and motivation, an emergency has occurred, disorganization…?

Scenario 5:*An instructor requests that online courses not be customized with date specific designations because having to regularly and systematically input data would feel highly constraining.*

Reflection: Could this action be perceived as a time saving strategy or convey a lack of dedication to practice?

Scenario 6:*Instructors reveal that levels of interest and participation in their online courses would be substantially greater if they were just beginning their careers.*

Reflection: Can periodic evaluations actually assess interest and commitment?

Scenario 7:*Adult students are often required to rely on research and peer reviewed studies no older than five (5) years; yet, online instructors use outdated technology statements, texts, statistics, broken web links, and obsolete data having little or no relevance to the present discussion.*

Reflection: Should online instructors be held to the same standards as adult learners or professional peers?

Scenario 8:*Married and unmarried instructors and adult students use online learning environments to pursue private relationships.*

Reflection: Do institutional policies governing instructor-student or employee relations also apply to online learning environments? Could this conduct create discomfort or a hostile learning environment*?*

Scenario 9:*Previously acquainted instructors and students form alliances and operate as course cohorts while inadvertently excluding new students from meaningful discussions.*

Reflection: In what ways can lack of inclusion disrupt an online learning community?

Scenario 10:*A member of an assigned learning group is only contributory to the learning dialogue before the weeks discussion board closes but receives grades comparable to students who regularly participate throughout the week.*

Reflection: Are performance pressures related to student and professional evaluations forcing grade inflation?

CONCLUSION

The Internet is a conduit for learning through universal access to vast networks of people and information; thus, the World Wide Web is becoming an advantageous path for professional development activities and scholarly pursuits. As global markets for online education increase, demand for quality courses and instructors also increase. High performance standards, commitments to practice, and ethical conduct legitimize virtual curricula and the environments in which learning takes place.

Successful adult students are highly organized, self-disciplined, and committed to learning. Degree or certificate-seeking adults appreciate independently structured study options available to them through online classrooms.

As global practitioners journey through this new teaching frontier, they must provide confidence-building support to adult students newly initiated into online learning communities. The first step to successful teaching is calming student

anxieties and alleviating confusion.

Instructors can damage course credibility by attempting to develop basic computer skills and technological competencies while actively teaching an online course.

Interacting cohesively as teachers and online peers requires advanced communication skills. To fulfill course requirements, students must be participatory in the process; instructors must also contribute to the discussion and fairly assess student performance.

Online education is important to adult learners. Confidence is vital to student achievement; reciprocal trust builds advanced networks for scholarship. Instructors who are not enthusiastic about online teaching may want to reassess their participation in virtual learning environments.

Adult students must be regarded as customers who are paying substantial sums for a specialized service. Without students or customers, institutions and businesses struggle financially and people become unemployed. Education is an expensive investment. Students must receive high quality products that instructors would purchase for their family members or themselves. To initiate positive models for change, sharing and examining conduct, commitment, and practice provides working professionals with valuable thought-provoking insight. Reflect on the following question:

Would you personally pay a month's wages or more to take your online courses or training as a graded adult student or career professional?

Although online specialists, researchers, and instructors may collectively report similar experiences, practitioners are encouraged to examine, assess, and consider the following while critically reflecting on personal ideologies, professional practice, and best practice development**:**

- Have you recently completed computer software training and developed online course management skills?
- Are your textbooks and course materials fresh, relevant, and up-to-date?
- Are your instructions and assignments well written and clear?
- Have you checked course content for syntax, spelling, and grammatical errors?
- Are web links to outside resources current and functional?

For further consideration:

- All participants in online education must be mindful of tone and language in written communication.
- An online course will not automatically teach itself.
- Online teaching may not be for you if regularly updating schedules and continual monitoring of course discussions are restrictive.
- Simple navigation and clear instructions ease anxieties experienced by first time online learners.
- Before the course begins make certain course materials are organized and complete.
- Inform students immediately if an emergency necessitates instructor and scheduling changes.
- Create a welcoming and inclusive learning community.
- Steer clear of favoritism.
- Grade or evaluate objectively and fairly.
- Prevent access to student profiles and identities by unregistered course outsiders.
- Remember that enrollment, tuition, and fees sustain institutions and pay instructor wages.
- Never plagiarize, take credit for, borrow from, or publish another person's original manuscripts, research, ideas, or work product without attribution or permission.
- In adult learning, equality matters; subservience is unwarranted.
- Always remember to pay compensation offered to teaching assistants or contracted

employees for assistance with an online course.
- Sexual harassment policies may also apply to written communication.

And, above all, hold yourself to the highest professional standards. In conclusion, keep the following in mind:

- **Professionalism and Ethics:** Motivated and committed online instructors inspire adult students.
- **Adult learners:** Always treat adult learners the way you would want to be treated if you were an adult student taking a graded or ungraded course online.
- **Love for Learning:** Interesting and enthusiastic instructors can cultivate a culture of lifelong learners.
- **Encourage Creativity:** Building flexibility into courses and training will accommodate the integration of adult life experience into curricula and personal development.
- **Be Responsive:** It may be prudent to have an assistant or alternate contact person monitor course e-mail and discussion boards to help students needing immediate assistance.
- **Tell the Truth:** All adults appreciate honesty in business, personal, and academic dealings.
- **Equality:** New students inside and outside an instructor's industry or field of study appreciate being included in camaraderie afforded to familiar students or employees.
- **Blended or Hybrid Courses:** Consider access, travel, and geographic limitations when designing a blended or hybrid course that combines online coursework with face-to-face meetings. It may be impossible for some adult students to travel or attend meetings in courses that may be suitably and wholly offered online.
- **Ready, Set, Teach:** Have all components of your online course teaching-ready. Building an online course, while actively teaching it, creates stress for everyone and can disrupt the learning environment.

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Chapter 4
The Virtual University:
Distance Learning Spaces for Adult Learners

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ABSTRACT

By offering self-designed, guided independent study, for-profit virtual universities began as alternatives to traditional graduate education that emphasized full-time study and ignored the life demands of adult students. However, through the process of gaining accreditation, recognition by the academy, and acceptance in the marketplace, virtual universities now more closely resemble traditional institutions. Their challenge to traditional academic practices predominately rests with the use of electronic tools for learning and the access virtual universities provide thousands of part-time learners pursuing doctoral degrees.

INTRODUCTION

New delivery systems are challenging the supremacy of the physical classroom. Virtual (online) institutions of higher education are disputing the primacy of land-based universities as the only legitimate form of education for adults. Online and mobile learning tools are increasing access to opportunities for postsecondary adult education. However, little has been published about the ways in which adult learning is taking place in the virtual universities (VUs). These institutions have emerged in the past decade as providers of proprietary higher education to thousands of adults who otherwise may not have opportunities to engage in postsecondary study. How virtual universities came about, what they are doing to help adult learners achieve better lives, and what their future holds are the themes of this chapter.

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BACKGROUND

As the educational marketplace becomes predominately adult-dominated, and as higher education institutions compete for adult enrollments, understanding how virtual universities are changing the landscape of higher education will be a significant issue in adult education. A number of trends are converging. For example, students learning online will outnumber those in seats for the majority of their education (Allen & Seaman, 2007). Learning is globally available at any time and in any place. Students entering the university have grown up with technology and expect to interact and learn through electronically mediated environments. For example, students are able to access information online while sitting in class. This necessitates additional skills to evaluate sources of information critically.

University faculty will need to consider the question of how they deal with the changing nature of the classroom, access to information, and how private VUs can provide opportunities for learning on a global basis, especially at the graduate level to otherwise disenfranchised learners (Cassano, 2008). Additionally, private VUs are challenging the notion of the traditional campus and the interactions that take place on a land-based campus. In essence, the virtual university suggests that learning opportunities should come to the adult learner rather than adult learners having to come to the campus. Considering the classroom as the space in which learning occurs, we can reconceptualize learning spaces to include the virtual as well as the face to face. This will influence how formal education is provided and, in turn, how adults will learn in the networked age.

Attempts at forecasting the future of learning have relied on applying current technologies to learning and have manipulated the settings for learning. For example, Levin (2002) forecasted the idea of tele-task forces for collaborative learning, neighborhood learning centers, and tele-apprenticeships. The models were rather conservative and did not fundamentally alter the manner in which content was provided or the roles of the instructor and learner. Virtual universities are on the technological edge regarding adult learning. They are altering how graduate education is obtained and are redefining the interactions between faculty member and adult learner.

Distance learning institutions held forth the promise of providing high-quality adult education any place, any time, and at any pace. This chapter describes the manner in which VUs are delivering on that promise. This chapter is informed by public sources of information as well as our experience teaching in various private VUs. The authors and the voices reflected in this chapter have lived the lives of online instructors. They have been involved with graduate online distance education as it evolved from the idea of distance learning as independent study to the notion of education delivered through the virtual campus. This chapter addresses the following questions in the context of independent, for-profit virtual institutions:

- What were the visions guiding the development of adult-focused online universities?
- What characteristics do VUs share that help adult learners achieve better lives?
- What trends are emerging for VUs in relation to traditional universities?

The emergence of the for-profit, virtual university primarily serving adult learners continues the evolution of offering opportunities for those learners who, because of geographic location, work and family commitments, or prior academic experience, could not attend or not be accepted at many of the established land-based universities. Although Hanna (2007) characterizes these universities as motivated by profit, these institutions have provided greater opportunity for adult learners by responding to their needs for baccalaureate to graduate education. In addition, VUs have adopted online and collaborative tech-

nologies more rapidly than traditional land-based universities.

Clark (2007) defines the virtual campus as an educational organization that offers courses through the Internet or Web-based methods. This is a simplistic view and ignores the structure and organization that have developed to support the online learner. The virtual campus as it has evolved embraces the full range of services that might be found on a land-based campus, with the exception of sports and other inter- and extramural activities. Private VUs share many common characteristics regarding formation, mission, and delivery of services. Garber (2006) suggested a conceptual scheme for analyzing characteristics of an educational delivery system that include (a) an adult focus, (b) alignment with the professional/working needs of adults, (c) movement through a degree, (d) accessibility, and (e) learning connected to the work force and the community for the betterment of both. We will examine the virtual university in the context of those characteristics.

THE VISION OF AN ADULT-FOCUSED INSTITUTION

The 1960s were a time of unrest and innovation at North American universities. Given the zeitgeist, the climate was supportive of alternative approaches to the ways in which graduate education was provided and completed. The for-profit VUs began as a reaction to the place- and time-bounded requirements that dominated graduate education. Traditional institutions' emphasis on full-time study also neglected the life demands of the adult students. The idea of the VU was to provide a place and space for working adult learners to meet and achieve their educational objectives with a faculty strongly committed to innovation and learner-centered philosophical stances. At first, the VU was not a technological innovation but an educational alternative grounded in the ideas of andragogy and learning contracts (Knowles, 1970). According to Brian Austin (personal communication, July 23, 2008), who was a faculty member and later dean of psychology at two virtual universities, the VU was conceptualized as a place for doctoral students to take control of their education and complete their degrees, thus building on the concept that adult learners investigate topics of interest to them and build from their experiences.

Admission was granted to those learners who had been in traditional doctoral programs and were unable to complete the dissertation for financial, personal, work, or other reasons. Bruce Francis, a faculty member at two VUs, recalls the impetus behind the curriculum design:

The essence of doctoral education was the relationship between the learner and the mentor. The idea was to change doctoral education to establish a more collegial relationship in which the learner was not looked down upon. . . . The model of education had to fit the lifestyle of the learner, not the learner fitting into the lifestyle of the program. Thus, the needs of learners were central. (B. Francis, personal communication, August 5, 2008)

Graduate education could be provided at a distance. Alternative educators viewed an alternative form of graduate education as a vehicle for introducing reform in public education. In describing the early years of distance education, Austin (personal communication, July 23, 2008) expressed the excitement and hope that alternative graduate education would bring to higher education. Distance education in the mid-1970s was primarily a commitment to correspondence and a four-week summer session. In the early 1980s, VUs moved to a formal curriculum and a four-week summer session with focused seminars. VUs no longer thought of distance education in terms of correspondence but rather as dispersed residency. This was a critical point in their development. Distance education meant dispersed residency with knowledge/competency demonstration through modules. This approach had been well under way in Europe during the 1970s but was new to the United States (Mason, 2000).

The residency model was built on the need to engage the community in sustained study for short periods of time. It was an institute for innovative practices for teachers, curriculum developers, and leaders. The founders sought to provide useful knowledge for informed practice. Therefore, they looked for faculty to develop innovative practices through applied professional research in education, human services, and business. The mission of this type of institution was to develop a scholar-practitioner, one who could be a leader in his or her professional setting and use theory to inform and guide practice (B. Austin, personal communication, July 23, 2008).

ALIGNMENT WITH THE PROFESSIONAL/WORKING NEEDS OF ADULTS

The early curriculum models consisted of guided independent study with a faculty assessor. The curriculum was designed around a core set of knowledge modules and specialization modules. Each module was designed to respond to theory in a basic social science area of inquiry and examine the empirical research in depth. Each module also included a component in which the learner was to demonstrate application of theory and research to a real-world problem. The unique feature of the learning model was an emphasis on the needs of the adult learner in the context of the learner's professional life. Rather than faculty determining readings, activities, and evaluation, learners, given general guidelines, developed learning agreements based on their discipline and professional interests. This learning model emphasized a general understanding of social science knowledge as applied at the individual, group, and societal levels. It matched the ways people lived and learned (B. Francis, August 5, 2008). The learning model was based on the mission of the institutions to connect theory and practice, thus bringing about positive changes in society.

According to Austin (personal communication, July 23, 2008), the VUs "never lost sight of their potential to change practice and communities through innovative ideas in adult and collaborative learning." VUs were built upon the belief that students have an obligation to practice in their fields and apply their knowledge in ways that move their field of inquiry, their communities, and society toward higher levels of thinking and acting. The focus of the VU is to promote the idea of the scholar-practitioner, a degree holder, especially at the doctoral level, who applies theory, conducts research, and acts on that research in the world of practice.

The VU learning model emphasized the learning of intellectual skills over receiving a grade. Recognizing the busy lives that working adults maintained, learning activities were accomplished on a schedule designed by the learner rather than by an academic calendar. Generally, a learning project could last from six to 12 months. Projects were redone as often as necessary until the criteria for an acceptable learning outcome was determined by the faculty and student.

MOVEMENT TOWARD SUCCESSFUL DEGREE COMPLETION

Early in the graduate program, the learner was expected to develop the skills necessary to conduct and report on independent research. Each stop of the learning model respected the time constraints and individual learning styles of the adult learner. The learning model was designed to begin the process of thinking through a dissertation topic as well as developing the thinking and writing skills needed for independent research.

One VU committed to social change delivered content and learning process skills through knowledge area modules in which learners were expected to address content from a theoretical, empirical, and applied knowledge base. The modules were completed on a timetable developed by the learner

using the vehicle of a learning contract. The learning contract specified the readings, topics to be investigated, and the evaluation plan.

With the emphasis on social change, learner-centeredness, and connection to practice issues, the learning model reinforced the notion of independent exploration of a topic under the guidance of a faculty assessor. Writing a learning agreement taught the learner how to frame a problem, obtain sources, and integrate the content to develop an original argument that had theoretical, empirical, and practical dimensions. The course work was designed to develop the cognitive skills needed to write and present a dissertation. The model suggested that the learner would easily be able to transition from writing in a knowledge area to writing a dissertation. In that way, there would be continuity between the skills needed to plan and organize content areas and those needed to write the dissertation. Learner-centeredness included extensive collaboration between the assessor and learner in the development of critical thinking skills, assessment tools, and a sense of responsibility for learning on the part of the student. Students were responsible for shaping the curriculum to best meet their contextual needs. Students were developing skills in constructing purposeful learning activities and approaches, the idea of meta-learning; i.e., learning about their own learning (Bosch et al., 2008; Emes, 2003).

Accessibility

The most notable feature of the VU is the student body. The ideal of a dispersed learning model, a self-designed timetable for completing the degree, and an open admissions policy provided an opportunity for working adults in midlife to return to an academic institution and work toward obtaining a graduate degree.

In the VU, life experience and desire are factors in the admissions process. For working adult learners, the opportunity to study at the doctoral level may be hindered by requirements such as full-time status, grade point average (GPA), the graduate record examination (GRE), interviews, and the university academic calendar designed around daytime rather than evening classes. VUs have provided access to higher education and the opportunity to succeed to those who might be denied admission. In 2006, one VU admitted more than 15,000 graduate students, of whom approximately 4,000 were doctoral students. Although GRE scores are not required, applicants must have a master's degree and an acceptable GPA. The GPA range across the university was 3.24-3.77. Twenty applicants were denied admission because of low GPAs and 103 applicants were denied admission due to inadequate preparation for the intended field of study. Another VU offers more than 970 online courses and 21 undergraduate and graduate degree programs in 109 specialized areas of study.

One VU has more than 23,700 learners from all 50 states and 45 countries. Women outnumber men 68% to 32%, and urban learners (at 79%) outnumber learners in rural areas (at 21%). The average age is 40 (ranging from 19-86), and 42% of the learners are people of color. Only 10% of those enrolled attend full time, with 90% studying part time (Capella, 2008). The VUs have also increased accessibility to graduate education for women and minorities. In 2006, women constituted more than 80% of the applicants in two colleges and were the majority of applicants across the campus. Minorities accounted for 48% of the applicants. Applicants tend to come from other innovative and nontraditional programs that attract adult learners rather than from the traditional universities. VUs have increased the accessibility of doctoral education and have increased the diversity of students.

VUs have purposefully made decisions to comply with accessibility standards related to assistive technologies and have active ADA offices to work with individuals on needed accommodations. With students all over the world participating in courses, asynchronous technology is employed because it is universally accessible.

Availability

As VUs have grown in terms of faculty and students, they have used technology to provide services that learners would find on any physical campus. Learners can conduct all daily transactions with university administration online. Services are available 24 hours a day, seven days a week. VUs also offer phone contact for those who prefer that method of communication. In addition, faculty services in the form of mentoring and instructional responsibilities are available around the clock. The expectations for faculty-student interactions are carefully prescribed in terms of responsiveness for feedback, postings in the online classrooms, and turnaround time for grading of weekly assignments. In virtual institutions, teaching is also a 24/7 activity. Expectations for faculty include (a) reviewing postings and discussions three to four days a week on a staggered schedule, (b) posting to the discussion forum three to four days a week and responding to at least two-thirds of the class weekly, (c) checking and responding to e-mail messages every 48 hours during weekdays, (d) grading assignments within seven business days, and (e) holding office hours two hours per week.

VUs have no tenure systems. Teaching appointments are annual and based on responsiveness to learner needs as well as content expertise. Faculty activities are monitored for quality and consistency. The classrooms can be checked regularly for interactions between faculty and learners against the standards for timeliness and interaction. Building connections through frequent instructor-learner interaction increase student identification with the university as well as keep students involved in course activities. For doctoral students, a mentoring program was originally the norm. This has evolved in some institutions to assigning mentors closer to comprehensive examinations and the dissertation. Advising is the responsibility of staff so that the faculty can develop a mentoring relationship with their learners.

The online faculty member is either core or adjunct. Faculty are hired for their teaching and content expertise; and research is generally not supported, although it is valued. Adjunct faculty may teach in a number of VUs and still continue to conduct professional activities or hold jobs in industry.

CONNECTING THE WORKFORCE AND COMMUNITY FOR THE BETTERMENT OF BOTH

Providing graduate education for the professions is a hallmark of virtual institutions, and social change is at the heart of their missions. The goal is to provide professions with individuals who will work directly to bring about positive social change in concrete ways. The social change mission as exemplified in the learning model requires a deliberate process of creating and applying ideas, strategies, and actions to promote the worth, dignity, and development of individuals, communities, organizations, institutions, cultures, and societies. Positive social change, by definition, results in the improvement of human and social conditions. The commitment to social change guides the curriculum, the nature of doctoral dissertations, and the activities that are part of the residency requirement. One VU that believes so strongly in this mission awards scholarships to faculty and students who pursue social change in their practice (Walden, 2008).

The delivery system has the potential to increase the quantity and quality of individuals working in professions. At the undergraduate level, students are prepared for specific jobs. At the master's level, the focus is on mid-career professionals who want to improve their knowledge and skills. Today, programs are available in pubic health, education, nursing, professional psychology, mental health services, and public administration.

MOVING TOWARD A TRADITIONAL SYSTEM

Have VUs met the promise of providing high-quality adult learning any place, any time, and at any pace? By the year 2000, VUs had adopted online learning systems resembling typical land-based courses. Traditional grades had replaced the competency-based grading system, and classes were structured like traditional graduate courses. VUs retained their goal of meeting the lifestyle needs of adult learners but have moved toward traditional goals of graduate education.

Components of the self-designed, self-directed independent learning model are still present. However, to meet accreditation standards imposed by professional organizations, demands of learners for courses and transcripts more recognizable by employers and other funding agencies, and a more structured approach to learning, VUs are turning toward a traditional campus learning model. The transition is occurring in three phases. Phase one involves gaining legal accreditation; e.g., negotiating with libraries and hiring credentialed faculty. Phase two involves gaining recognition by the academy; e.g., hiring faculty who connect their research and publishing to the university and moving to an administrative structure of deans rather than vice presidents. Phase three involves demonstrating to employers that graduates are qualified to meet workplace expectations. Phases two and three continue to evolve. In the process, VUs have focused less on offering alternative ways of learning. The difference is in the delivery more than the design of the learning experience.

Virtual universities have increased the number of learners pursuing graduate degrees and have opened up doctoral degrees to those who wish to apply their knowledge and skills to improve practice and contribute to dealing with complex problems in their communities. The doctoral degree is now available any place and to nearly anyone who wishes to undertake graduate study. By graduating thousands of doctoral degree holders each year, VUs have raised the question of the meaning of the doctoral degree itself and have challenged the exclusivity of the doctoral degree.

Despite becoming more mainstream, we believe VUs will continue to question traditional academic practices in higher education. A tension in the desire to be innovative and on the edge is counterbalanced by the need for respectability and acceptance in the graduate academic community. While VUs continue to be on the edge of technology and promote electronic tools for learning, the experience of learning itself more closely resembles traditional institutions. At the same time, VUs challenge traditional universities to learn from them and move into the virtual world, thus making their own mark on learning alternatives in the 21st century.

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Chapter 5
Using Moodle to Teach Constructivist Learning Design Skills to Adult Learners

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ABSTRACT

This chapter describes a case study of the design and implementation of an online project-based course for learning constructivist instructional design techniques. Moodle, a free and open source learning management system, was chosen as a tool to meet both the goals of the course and the needs and abilities of the adult learners in this course. Despite the instructor's and students' inexperience with both Moodle and online courses, Moodle greatly facilitated the process, resulting in a largely successful and motivating learning experience.

INTRODUCTION

As a first year assistant professor of instructional technology, I was asked to teach an advanced instructional design course, the second in a sequence, delivered online to masters level students. This was my first online teaching experience, and indeed, my first experience teaching graduate students, as my earlier teaching experiences were with undergraduates or K-12 students. Earlier, I had expressed interest in teaching such an advanced instructional design course - modeling it after the courses developed as part of the TRAILS project (2008, Training and Resources for Assembling Interactive Learning Systems), and its successor, L^{2}TD (2008, Learning about Learning-Technology-Design). As the description from the TRAILS website reads:

TRAILS aims to broaden and support the pool of talent available to address the needs of K-12 education by creating powerful technology in forms such as simulations, interactive drill and practice, adaptive tutorials, and virtual manipulatives. Through the affiliated project-based design courses, it intends to have three major effects: to support and inspire higher-ed courses on the design of learning technologies, to generate new prototype tools for K-12 education, and, ultimately, to introduce tomorrow's

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designers to techniques they will use to create effective tools for future learners.

In the TRAILS and L²TD courses, education, visual design, and computer science students combine into teams to design and program interactive educational software and games.

In the first instructional design course of the sequence, taken in their very first semester of masters study, students learn the Dick & Carey model for the systematic design of instruction (Dick, Carey, & Carey, 2004), including the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). This first course concerned modern instructional design techniques, and students developed paper-based or face to face training. Looking at the syllabi from other advanced instructional design courses at other universities, I felt a nice complement to the beginner course would be for students to a) learn about post-modern instructional design techniques, and b) develop online computer-based instructional resources. That is essentially what students in the TRAILS and L²TD courses were doing, by designing educational games and simulations. Examples of both modern and post-modern instructional design techniques are listed on a website by Martin Ryder (2008).

However, our masters students were not prepared to develop such complex computer-based instructional resources as created in the TRAILS and L²TD courses. There were at least two major hurdles. One is that these students for the most part had no previous experience with computer development tools and technologies, such as HTML, Flash, or other development tools. Students could take a course on the development of web-based resources, but this was optional and usually not taken until the last year of study. These students were first year students. The second issue was that these students had no previous course on learning theory. A learning theory class was not offered until the end of their degree program, at the end of their second year. I felt that a basic knowledge of learning and pedagogical theories, including constructivism, and some development skill, such as creating HTML webpages or Flash animations, was a prerequisite for such an advanced instructional methods course. Other differences from the TRAILS and L²TD courses included the fact that my course was to be delivered online, not face-to-face, there not time to get the computer science department involved in collaborating with the class, and finally, these students were adult learners with less time to devote to coursework, and already working full-time jobs.

I followed two strategies for overcoming the two major hurdles, however, which allowed me to keep the same essential course goals in place of having students actually develop online constructivist learning resources and activities. The first strategy to overcome students' lack of prior coursework on learning theory was to both incorporate a crash course on learning theory in my course, and model constructivist techniques in my own teaching for the students. The second strategy for overcoming students' lack of computer-based development experience was to use a tool which allowed students to design their own online instructional activities without requiring any knowledge of HTML or programming, a free learning management tool called Moodle (2008). I describe the course, constructivist philosophy, the Moodle tool, and the adult learners who took this course in more detail below.

Course Description & Philosophy

The description of this advanced course was as follows:

In this course we'll learn about applying advanced instructional concepts and practices, including:

- techniques for designing constructivist learning environments
- multimedia design and evaluation principles
- designing e-learning/online instruction

The course goals consist of:

- Learning constructivist design principles and frameworks
- Learning to evaluate existing computer-based instructional resources
- Learning new instructional strategies such as contrasting cases and problem-based learning
- Developing a computer-based resource or unit that employs constructivist techniques for fostering conceptual learning

The justification for this course again was two-fold. Currently, instructional technology masters programs tend to focus more on traditional, modern instructional design models (as listed on Ryder, 2008), with little time devoted to newer, constructivist learning techniques such as learning from games and simulations, problem-based learning, project-based learning, case-based learning, and the like. This is despite the fact that constructivist techniques have been viewed as complementary to traditional methods, and can add to an instructional designer's toolbox (Brandon, 2004). Secondly, many modern instructional design teams today develop online training, including web pages, videos, and interactive programs developed with Flash or other tools. Hence giving students an experience designing online instructional activities can also add to their toolbox of learning design strategies as well. As a resource for this course, we used the text *How People Learn* (Bransford, Brown, & Cocking, 1999), which has a full-text version that is freely accessible online. We used other information resources as well, including articles, videos, and websites. Generally though I only required one short reading per week, with the others provided as optional resources for additional information.

Constructivism

Constructivism is a conception of learning that is contrasted with objectivist notions of learning. An objectivist conception of learning assumes that knowledge can be transferred as is from the teacher or technology to the learner. The constructivist perspective, however, is that knowledge is subjective and interpretative, and must be constructed by an individual (Jonassen, 1998). Constructivist learning environments are designed to facilitate a learner's construction of new knowledge. As listed above, some example constructivist learning environments may include games and simulations, modeling tools such as concept maps or flow charts, project or problem-based learning activities, and other complex, open-ended learning environments.

Constructivist techniques are often counter-intuitive and can sometimes even turn a traditional notion of designing instruction on its head. For example, in certain cases learning gains are greater when students explore a complex, open-ended learning environment like a simulation or case library *before* getting a traditional lecture about the principles one wants students to learn from such an environment, rather than the other way around (Brant, Hooper, & Sugrue, 1991; Schwartz & Bransford, 1998). Again this is because such constructivist learning environments often do not provide or transmit information to students so much as they require information and knowledge from students to be used effectively. Even though students may or may not fully understand the open-ended learning environment, after exploring the environment they may have formed questions or strategies for learning about the domain. This engenders in students a preparedness for future learning, and the students are primed to attend to a subsequent lecture or traditional form of instruction about the concepts they need to know. Contrast that with students who receive a traditional decontextualized lecture or reading before or instead of experiencing the constructivist

learning environment. They don't have the same need to know that the other groups of students would have.

Course Audience

The audience for this online course were over 50 working professionals in education, training, higher education, and related fields. The course syllabus stated: "Some of us design instruction for K-12 classrooms (history, science, math, english...) and school libraries, some for higher education settings, and others for professional training scenarios (in business, government, health care, military, non-profits, etc.). I hope to tailor this class and the assignments to best suit your individual needs and interests."

The book *Developing Adult Learners* perhaps best describes the challenges of teaching adult learners who are wiser than yourself in many ways:

Adults can be paradoxical learners. When adult educators walk into classrooms or workshops, they find a diverse group of learners who at one moment can draw on a rich store of life experiences and at the next may resist new ideas that challenge what they already know. Adults tend to be highly motivated to learn *yet* will sometimes focus on evaluations or grades rather than on learning. They think of themselves as "self-directed" *yet* they may feel shortchanged when an educator explains that she intends to be less a source of answers than a resource for learning [as in constructivist methods]. When entering or reentering college, many adults who have successfully managed their own professional development nevertheless sometimes revert to classroom strategies that worked for them in high school ("How many pages?" "Will this be on the test?"), generally trying to do "what the teacher wants." (Taylor, Mariernau, Fiddler, 2000, p. 3, my insert).

That describes some of the challenges we would face in this class, but I and the students helped one another make it become a largely enjoyable and successful experience, helped in part by a well-designed tool for creating learning activities, Moodle.

Moodle

Moodle (2008) is a course and learning management system (LMS) similar to other tools such as Blackboard or WebCT. Moodle has some distinguishing characteristics however which made it an ideal tool for this course.

1) Moodle is free and open source, and runs on any platform using the Apache webserver, MySQL database, PHP programming language ("AMP"). Our university uses Blackboard as its officially supported course management tool. However, in this course I wanted the students to be designers, to design their own online instructional activities. There were approximately 50 students in my course, and asking our university to properly configure 50 Blackboard courses would have been taken too much time. Instead, one can install and run Moodle on even a modest computer and let students register for accounts on their own. Moodle has a "course request" form which allows students to request their own course be created which they have total control over. Maintaining the Moodle server turned out to require no work on my own part, other than occasionally updating the Debian Linux server on which it ran, and saving backups (zip files) of the Moodle courses on a separate machine in case the server ever failed or was corrupted.
2) Moodle provides a WYSIWYG (what you see is what you get) editor, that allows students and instructors to create web pages and embed audio or video without requiring one to understand the underlying HTML and Javascript code.

3) Moodle itself is designed from particular type of constructivist philosophy, social constructionism (Philosophy, 2008). Social constructivism and constructionism is an extension of constructivism in which groups of people construct knowledge together to create a shared meaning. Moodle provides an assortment of tools that can be used for constructivist and social learning, including blogs (a personal online journal or diary), a wiki (webpages anyone can directly edit in their web browser), chat room, database, discussion forum, and glossary in addition to traditional course management tools such as quizzes, lessons, assignments, and calendar and gradebook tools. I also experimented with a free, open source real-time web-conferencing application that integrates with Moodle, known as Dimdim (2008), during the course.

Course Design & Implementation

The general design of the course consisted of two major parts. The first involved reading, discussion, and reflection. Each week a different topic was covered, with one required reading or resource, and other optional resources. Students posted to a weekly discussion forum their own thoughts about the topic, or their reactions to others' thoughts. My only requirement was that they posted a "thoughtful response," defined as a paragraph that significantly added to the discussion. Posts that simply stated "I agree" or "I disagree" did not count.

The second and biggest component of the course was a design project. Based on previous experience working on my own design projects and having K-12 students work on design projects, I have found that keeping a journal of your thoughts and reflections can be helpful in improving the quality of your design. Hence in our course, the students used the Moodle blog tool. The very first week students blogged about themselves, so that I and the students could get to know each other better. Throughout the semester I provided guidance for students to post weekly thoughts to their blog, reflecting on coming up with a topic for their project, collecting data, developing assessment and learning activities, and testing their design with real K-12 students or other classmates. The actual design project itself was introduced in the syllabus:

You will be working on a major design project for this class. You'll design an online course unit or activity that employs constructivist techniques for fostering better understanding of a concept. The project must address conceptual understanding of a topic in which people typically have misconceptions resistant to traditional instruction/lecture. You'll learn more about what that means the third week of class when we watch some videos and start reading *How People Learn*. Don't worry, there is a huge wealth of examples already documented out there, especially if you are in K-12 or higher education. I (and you) will be building a library of cases and examples from which you can draw.

Since the majority of students in this class don't know HTML or programming, I'll be showing you how to create learning activities in Moodle itself, which doesn't require any knowledge of HTML. You'll become an instructor in your own course on the Moodle site. Many e-learning and design jobs are looking for people with experience teaching with a course management system (CMS) like Blackboard or Moodle. And you only need to learn enough to create the instructional resources. You don't need to learn nitty gritty things like how to manage the gradebook or how to customize user permissions and roles and so forth.

And early in the semester I put up these guidelines and criteria for the design project. I broke the project into several stages to make it more manageable for the students. This is a short version of those guidelines:

1. Think of examples of conceptual misconceptions or difficulties people have in a particular topic area.
2. Document these difficulties/misconceptions. You need to find some evidence (besides your own intuition) that people have these difficulties. When you have collected this evidence, write about it in your blog.
3. Develop a reliable way to assess these difficulties that you can incorporate into your instruction. This might be for example a short quiz (in your own Moodle course), or essay questions, or have your "students" create a concept map, etc. Some way for you to tell what the students know or don't know, and whether they show they have the misconceptions or not.
4. Incorporate the assessment into your online instruction. If you haven't already, incorporate this assessment into your online Moodle class. There are (at least) 3 ways to do this: as a pretest, post-test, or formative assessment activity.
5. Develop the instructional unit and activities. At this point my only requirements are that it has to be online, and that you use at least one constructivist technique or resource or activity. Something that requires students to interact/participate. [I gave some specific examples of constructivist activities that could be created in Moodle, including embedding an external game or simulation, creating a case library with the Moodle database tool, and other ideas.]
6. Test your online instruction. Once you have a prototype ready, you can try it out with other students in our class or real students (at least about 5 students). Use the How People Learn (HPL) Framework to evaluate your instruction to see what else it might be missing before you try it with real students.
7. Evaluate the results. Blog your evaluation of your instruction, what changes you would make, etc. Evaluate the results from the perspective of the HPL framework.
8. Revise your instruction and (ideally) try it again or show it to students again to see what they think.
9. Post to your blog your reflections on your design project, what you did, what you learned, etc.

General Criteria. In general your online instruction must show that:

- it targets conceptual learning, not (just) procedural learning
- it targets some conceptual difficulty / misconception (knowledge-centered)
- your instruction incorporates assessment (assessment-centered)
- your instruction employs constructivist learning techniques and is engaging to students (learner-centered)
- you incorporated the concepts and techniques that we learned about in class into your design
- you thoughtfully reflected on your design throughout the process and made modifications and adjustments as needed
- your instruction is professional quality and worthy of showing in your portfolio to existing or prospective employers

A third minor part of the course I tried as an experiment was to use the Moodle glossary. I asked students to contribute 10 terms to the glossary, related to the readings and topics in our course. I filled out some basic terms before the class began for the one or two students who had not taken the earlier design course, and did not know what terms like "ADDIE" or "ISD" meant, for example. This also was intended to model to students what glossary entries should look like, and that they did not have to be long at all (only a paragraph). We even had a glossary of hundreds of terms covered in the course, including "blogs," "constructivism," and so forth.

Issues During the Course

The majority of the students were already familiar with using Blackboard in the earlier instructional design course, and thus, despite some feeling at first a bit overwhelmed that they had to learn yet another tool, they for the most part picked up how to use the Moodle site fairly quickly. However, some students still were confused by the layout Moodle uses for courses, in which there are many boxes on the left and right sides filled with information and links, and the weekly course content goes for down the middle of the page. The default page layout for a Moodle course is very "busy." Luckily a couple of my students contacted me with some feedback, and in turn I created a narrated video screencast "tour" of our course website. My original intention for this course was to create many video screencasts about how to use Moodle, such as how to edit wiki pages, and how to add activities to your own Moodle course. I found some helpful videos and webpages that already existed and used them instead. However, that still did not help students with *our* course, and its unique features. I now wish I had created the video before the course began, however, it still proved to be helpful to those students who were having trouble navigating the site or knowing what to do.

I thought one of my main difficulties would be stimulating fruitful discussions in the discussion forums on a weekly basis, yet in this matter I greatly underestimated the thoughtfulness and dedication of these adult learners. The discussions were always very interesting, and the students really did engage with the material and with one another. Fostering effective class participation, always a challenge with younger learners, proved to be a true pleasure in this course. That said, I did not often enough respond to the forum posts of the students. Anytime they asked a question or needed help I always responded as quickly as I could, yet I did not tend to respond to thoughtful comments with "good comment" or "nice job" type of posts, as I might have if it were a face to face discussion. That simply would have been too time consuming with 50 students posting every week. I instead just tried to convey to the whole class how impressed I was with their thoughtful discussions.

Another major issue that arose early in the semester was the fact that it was quite difficult for some of the students to pick a topic for their instructional design project. I had not thought before the class began that this would be an issue, since the students had to pick out their own topic in the first instructional design course. However, the additional constraints that I put on the task, to pick a "conceptual" topic with which people normally have difficulty learning from traditional lectures or other means, made it a tougher task. In redoing the class next time, I will provide a list of example topics and projects that can help guide students in deciding on their own design project topics.

The actual Moodle course activities students designed were on the whole quite impressive. I allowed students to team up, and those that did produced especially well-designed instructional activities. Students played on the strengths and skills they had from experience, such as art and design, math education, information technology training, and so forth. Our class ended up creating

Feedback at the end of Course

I received two types of feedback from the students at the end of the course. One was accidental and unexpected – I received unsolicited emails from about half of the students which was all positive (to be expected since it was non-anonymous). The second type of feedback was from an anonymous survey I gave the students in the last week of the course, using the Feedback module for Moodle. I received some good suggestions for improving the course in the future from both forms of feedback.

Email Feedback

Some of the email feedback is listed below, with my italics added for emphasis:

[Student A] I will also take an opportunity to give course feedback in the moodle site itself. But I wanted to send kind of a personal message. I really enjoyed this class. At first the constructivist point of view was difficult for me. I am so used to having someone hold my hand through a learning process. I kept feeling like I was doing something wrong because of the past instruction I was used to. As I was building my course, I took several side tracks because of all the options we had. I created two games that I didn't even end up using in my course. Which was a pretty fun and interesting experience.

I felt you modeled the teaching you wanted us to learn very effectively. There was ample resources and direction given, that as I was constructing my course, I had confidence in what next steps I needed to take.

This course was a neat experience for me.

[Student B] Thanks for all your work on our current course. *Now that I'm developing my own, I can appreciate all the work you put into it*. Thanks, I'm learning a lot.

[Student C] I had really enjoyed your course! I thought you did a great job of informing us of what we were to do each week and the work load was not overwhelming. I am glad you introduced us to moodle...maybe you should tell [next instructor] to use it for our next course!

[Student D] I really learned a lot in your course. Moodle seemed at first like it was impossible, but I had a huge sense of accomplishment when I completed my project.

[Student E] I finally tried out my Moodle course in one 5th grade class [name removed] School. Wow, it was really great to see students actually doing it and learning from my efforts last semester--just a thrill! (I'll do it with the other 5th grade too.) The students were proficient with the computer activities- all were engaged.

Their teacher required the students to fill out the Exit Survey, and it is fun and helpful to read the comments; they had fun and it looks like they learned something too. [School name removed] is going to keep it as a link for a while! I know where to simplify in some areas- Thanks again for a great class!

From the email feedback, I believe the course was successful at modeling constructivist methods for the students, and that Moodle was an appropriate and effective tool for meeting the course goals.

Anonymous Feedback about Moodle

In an anonymous exit survey I asked the students a series of open-ended questions, including their opinion about Moodle (vs. Blackboard), and I asked for their suggestions for improving how we use the tool and for improving my teaching and the course as a whole. Approximately 37 students responded.

The opinion of Moodle was very favorable. 29 of the 37 (78%) indicated they liked or strongly liked Moodle. Only two disliked it and six were neutral. Below are some of the comments about Moodle, including negative ones:

"I really absolutely liked it. It has influenced me in the direction that I want to go. I hope that I can access information from our Moodle class easily once the class is over, as I plan to continue using Moodle for myself and students.There was so much valuable information and I want to read all of it, and read what I liked, again."

"I personally like blackboard better. I like the design of it better. I found moodle to be a little confusing, and it had too much other information that was distracting. However, I am glad I learned moodle, it is another program I can tell perspective employers that I am familiar with. I like to stay up on the latest technologies and programs."

"I did not like Moodle at first. But it threw me for a loop. I know that there was an explanation at the beginning of the semester, but I was so taken

back that this course wasn't on Blackboard that I didn't understand the purpose of Moodle until later. I liked that we were able to create an online course. I'm excited to have this in my portfolio and feel that it will make me more marketable."

"Once I understood moodle I didn't mind it. I would probably suggest keeping moddle in the fact that moodle is a program that teachers can use for their own classes. By experiencing it in this class helps us understand how to use it. I would suggest keeping it."

"Moodle is so much more flexible than Blackboard. I have tried to design a class in blackboard and didn't like it. I have really been able to figure out the features of Moodle. Moodle is much easier that Blackboard."

"I found it was cumbersome after several weeks to know what week we were on because it always returns to the top of the page. Perhaps, you could high light the week we are on. I always had to pull out a calendar to remember where I should scroll down to. " [And indeed I submitted this as a feature request for Moodle, to be able to collapse, yet not completely hide, previous weeks, so that students could quickly see the current week's activities, and yet still be able to review previous activities.]

"I struggled at first to understand the difference between the blogs and the forums. It took me a while to understand how the course was set up. After I understood the process I liked it. I am thinking of making a whole chapter or trimester of materials using moodle for my masters project."

"Moodle was too busy for me. At first, I did not know where to look, where to find things. I did not like that I couldn't tell what was new, what needed to be added. With that said, I did like using Moodle to make my course. "

"I would like to use it more and plan to try it out even when I am no longer enrolled in this class."

In addition to the issue of not being able to collapse previous week's activities, below are some other technical and interface issues that arose with Moodle that perhaps could be improved in the future:

- The Moodle wiki tool, based on an older ErfurtWiki engine, was out of date and difficult to use. There was no "add new page" link or button that would have made it easier for students to effectively use. The students found the glossary tool much easier to contribute to, and when given the choice, contributed more to the glossary than the wiki. The features of the Moodle wiki, other than the WYSIWYG editor, do not match up to other alternative wiki engines.
- The blog tool also was not as full-featured and personalizable as seen with other freen and open source blogging tools such as Wordpress. The blogs could not be closely integrated into the rest of the course or the gradebook.
- Moodle requires each user have an email address. My students who were K-12 teachers and wanted to try their activities with their own students quickly found this to be a problem, as have other K-12 teachers who have posted about this issue at the Moodle website. I was able to manually import student accounts which all used the teacher's email address as a workaround.
- It was not until late in the course that I found the Feedback module which allowed me to get anonymous feedback from my students. I really could have used that tool earlier in the semester, and yet the "Survey" tool that is included with Moodle is really not designed for creating your own surveys at all. Luckily, the Feedback module is slated for inclusion in future versions of Moodle.
- The textual documentation for Moodle is well-organized on their website, yet the videos are scattered across the web. I believe it would be helpful to incorporate an

organized collection of video screencasts in the main documentation for Moodle.

Anonymous Feedback about the Instructor and Course

Students also offered comments and suggestions directed to me and regarding the course as a whole. But before posting the exit survey, I shared with the class my own initial thoughts for revising and improving the course:

- Add or find more narrated screencast videos of how to do things in Moodle
- Short narrated powerpoint video presentations summarizing the readings, especially those weeks in which there isn't already a good summary reading, like we had for the weeks on simulations and multimedia design.
- More clarity about the scope of the design project. Next year's students will benefit greatly by being able to see what you all created this year.
- I think I might just drop the glossary entry requirement, and just use my own and your entries for future classes.
- I may drop the first week on reflecting on ADDIE & ISD since apparently this is already covered in another course.
- I'm really hoping future Moodle versions will have some improvements, too, like being able to collapse (yet not hide) previous weeks, and integrating the blog better into the rest of the course.
- I've learned some better ways to visually layout my course from looking at some of your design projects.
- I liked switching to alternating weeks of discussion and no discussion after we got past all the basics on constructivist techniques and so forth, to give folks more time to work on their project.

To this list, students added comments and suggestions of their own, including:

"Keep tinkering and stay understanding of your students. I really appreciated the Instructor's keeping in touch with us and being adaptable to our problems and needs. This was a great class with lots to learn. Thanks for introducing us to Moodle, it may be a great option for me in the future of my programs."

"I would be more clear on expectations for the ultimate design of the final project. I appreciate the project guidelines, but they came a little slower than I would have liked. I realize and appreciate that the guinea pig class just has to deal with that."

"I found the instructor to be helpful. He got back to us immediately to address concerns. He also did not get defensive when we gave him constructive criticism on the class. He admitted this class was a work in progress. I felt his grading was fair. I came away learning useable information with a reasonable work load, from this class. I will use the skills I learned in my teaching. "

"I learned alot from this course. [instructor name removed] always responded quickly to any questions I had. Keeping up with everyone's discussions was difficult. In another online class I had we were divided into ten discussion groups of six students each. I liked this format, it was easier to keep up with other students, made me feel connected to the students in my group, and we could easily respond to each other. This could even be the group to do formative evaluations for each other."

"Out of all the classes I have taken so far, this class has been the most enjoyable. I have learned the most from this class, also. [name removed] has been the best professor to work with. He has been very willing to help if needed by the students. By reading the discussion boards, he has helped just about every student with their questions."

"I like the idea of adding videos of yourself when explaining some things. Moodle was very hard to navigate at first. After a while, I got used

to it. I have enjoyed in other classes when the professor has a video where he explains idea + thoughts."

"I really liked it. For me it was similar to a baptism by fire type of situation. I really just had to try a lot of things in Moodle out and figure out how they worked. It would have been good to see more tutorials on how to create things and navigate in Moodle. I thought the instructor was particularly helpful and very easy to work with. I enjoyed the readings each week. "

In general from this and other feedback, I believe it will be helpful to create small groups the next time this course is taught, especially when seeing the quality of the projects resulting from those students who teamed up on their own to do the work. Perhaps I should have borrowed even more from Moodle's social constructionist philosophy myself, rather than emphasizing the individual. Before the course, I thought it might be too difficult or cumbersome to make people work together in teams, yet the students have a strong willingness to work together, and Moodle provides tools to support effective collaborative work.

Feedback after the Course was Over

Months after the course was over, some of the students were still actively using the Moodle site, and asking to keep using it for their final masters project or with their own students. They have been requesting for me to add new visual themes and plugins to the Moodle site so that they could use Moodle to its fullest. This was another primary reason for choosing Moodle instead of Blackboard for the design project in this course, because I knew I could keep it available after the course was over, unlike in Blackboard where all the course materials become inaccessible soon after the semester is over. Students could keep using the site, or share links to the projects they created to show colleagues or to put in their masters portfolio. In addition, some of the K-12 teachers even helped convince their principals or school districts to set up a Moodle server so that they and the whole school or district could use it. Being free and open source and runnable on low-cost hardware, Moodle has proved to be the most popular learning management system especially with K-12 schools and others for which Blackboard and other tools are cost-prohibitive.

CONCLUSION

In this chapter I've argued that Moodle was an effective tool to use in this course on constructivist learning design, partly because Moodle itself was designed from a constructivist philosophy. Does that mean that if one were teaching a different learning philosophy such as behaviorism one should use a behaviorist learning management system? In a strict sense, of course not, but in a larger sense, yes, it does facilitate student learning to practice what you preach. In fact in a behaviorism course I took as a student myself, our class visited a zoo and an animal lab and trained various animals, learning about behaviorist concepts such as operant conditioning in the process. In today's world if you were taking a behaviorist class online you could still use Moodle, however. Moodle is a very complex learning management system and is composed of many different tools, not all of which are constructivist in nature. The ever present gradebook, for example, is an age old example of learning from feedback and reinforcement. New tools are being developed for Moodle all the time, which are inspired by a variety of instructional theories and techniques.

The metaphor I would use to describe Moodle is a Swiss Army knife for online instruction. It may be adaptable to various types of instruction, or you may want to considering combining it with a more specialized and more effective tool for your topic, such as for example an online simulation of training an animal using operant conditioning principles. For the specific purposes and context

and audience for my course on constructivist learning design, however, Moodle has been very useful.

What I learned however is that the tool used for instruction helps, yet ultimately it is up to me and my students to create an effective learning experience. I have to be attentive as possible to the needs of my students, and in the future I would incorporate more opportunities for students to give me anonymous feedback about my teaching and the course. I also learned that it helps to show students how to do something via video rather than just have them read how to do it, and thus I plan to incorporate more videos and screencasts in the future. Lastly, I felt it was helpful to model what I was teaching and what I was expecting of the students (practice what you preach). By continuing to fill out some glossary entries beforehand, for example, and showing example design projects in future classes, students can more clearly understand the expectations of the course.

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Chapter 6
Community of Inquiry in Adult Online Learning:
Collaborative-Constructivist Approaches

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ABSTRACT

The adult education literature emphasizes community building in order to increase effectiveness and success of online teaching and learning. In this chapter the Community of Inquiry Framework that was developed by Garrison, Anderson and Archer (2000) has been introduced as a promising theory for adult learning in online environments. The chapter discusses the potential of the CoI framework to create effective adult online learning communities by utilizing the research findings from an online course. Overall, the research findings showed that students had positive attitudes toward the community developed in the course and that their perception of constituting elements of the community of inquiry was significantly related to perceived learning and satisfaction.

INTRODUCTION

The advances in information and communication technologies, changing needs of individuals, and globalization are the influencing forces for all societal endeavors - including adult learning (Merriam, Caffarella, Baumgartner, 2007). Training and degree programs and other continuing educational opportunities for adults are increasing. In today's world, learning occurs for adults in a variety of settings from formal institutional settings such as college or university to non-formal and informal contexts such as home or community at different times and for different purposes (Selwyn, 2006; Merriam, Caffarella, Baumgartner, 2007). However, adults are busy people and they have pressing responsibilities that often restrict participation in these learning environments. The main obstacle identified by adults is the lack of time, mainly due to work or family reasons (OECD, 2005; Merriam, Caffarella, Baumgartner, 2007). For these reasons, online learning environments have a growing interest and potential for widening access to education for adult learners.

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Growing interest in online learning has shifted the research from its technical aspects to more pedagogical concerns (Merriam, Caffarella, Baumgartner, 2007). Adult educators are now giving increased attention to designing online learning environments to meet adult learner needs, expectations, and maximizing its potential. Poorly designed online learning environments often result in unsuccessful or unsatisfactory educational experiences. DuCharme-Hansen and Dupin-Bryant (2005) indicate that problems with technology, instructor direction, building community, facilitating communication, or humanizing learning can sabotage educational efforts.

The purpose of this paper is to explore how a community of inquiry develops and progresses for adult learners in terms of their perceived learning and satisfaction. The Community of Inquiry framework was used to guide this research in an adult online learning environment. The potential of the framework to illuminate adult learning in an online environment is also discussed in the context of the results of this study.

BACKGROUND

Merriam, Cafarella and Baumgartner (2007) classify adult learning theories into 3 groups as western theories, eastern theories, and modern approaches. They indicate that western theories are more individualistic with an emphasis on freedom and independence, whereas eastern theories are more collectivistic with an emphasis on belonging, harmony and family. For example, self-directed learning and andragogy claim that people learn on their own as they mature (Merriam, Caffarella, Baumgartner, 2007). Others have gone further in proposing that self-direction in learning is the distinguishing characteristic of adult learning (Knowles, 1973; Brookfield, 1986). On the other hand, examples of eastern theories such as the Confucian way of thinking, Hindu perspective, or Islamic perspective emphasize interdependence instead of independence.

The assumption of traditional western adult learning theories is currently being challenged by eastern and modern theories (Mackeracher, 1996). The transition from traditional western theories to modern adult learning approaches indicates the shift from seeing learning as an individual activity to a more collaborative activity. In recent years, adult educators began to emphasize constructivist approaches and community building for more effective adult learning environments. Merriam, Cafarrella and Baumgartner (2007) claim that some aspects of constructivism can be found in adult learning theories such as active inquiry or the central role of experience. Garrison and Archer (2000) also emphasize a constructivist and collaborative approach in adult and higher education. It is argued here that constructivist approaches and community are necessary to create and confirm meaning and are essential to achieve effective critical thinking and self-directed learning. Building a community to facilitate critical thinking is important because "construction of meaning may result from individual critical reflection but ideas are generated and knowledge constructed through the collaborative and confirmatory process of sustained dialogue within a critical community of learners" (Garrison & Archer, 2000, p. 91).

Yorks and Kasl (2002) discuss the potential of collaborative inquiry to be a theory of adult learning. The authors state that collaborative inquiry provides a systematic structure for learning from experience. Learners organize themselves in small purposeful groups to solve a question and construct new meaning by engaging in cycles of reflection and action while evoking multiple ways of knowing and addressing validity problems. Moreover, Vella (2002) points out that learning is enhanced by peers who have similar experiences. They can challenge one another in ways a teacher can not and create a safe environment for the learner who is struggling with complex concepts, skills or attitudes. Besides constructing knowledge, Bruffee (1999) identifies the function of collaborative

groups in terms of a shared classroom. A shared classroom experience has a motivational aspect in that "when learners are deeply engaged, working in small groups or teams, it is often difficult to extricate them from the delight of that learning" (Vella, 2002, p. 25).

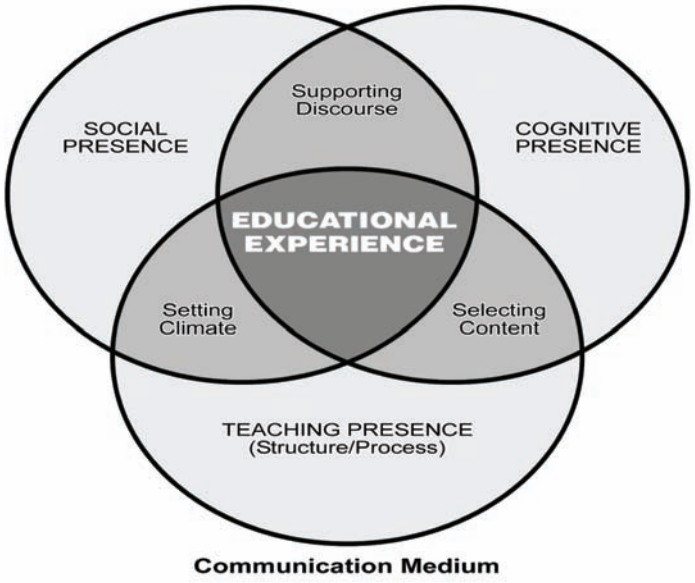
With an emphasis on critical thinking (i.e., reflection) and collaboration, a coherent theory that has attracted considerable attention in online learning research is the Community of Inquiry framework (Garrison & Arbaugh, 2007). The Community of Inquiry framework was developed by Garrison, Anderson and Archer (2000) as a guide and methodology to study the complex dynamics of online learning. The assumption is that a worthwhile educational experience occurs within the community through the interaction of three core elements: teaching presence, social presence and cognitive presence (see Figure 1). It could be said that the framework exists between the interplay of western and eastern theories with the overlap between cognitive independence and social interdependence. The underlying foundational perspective of the framework is a collaborative constructivist view of teaching and learning (Garrison & Anderson, 2003). Collaborative constructionism is in essence the recognition of the interplay between individual meaning and socially redeeming knowledge.

The first element of the framework is the development of cognitive presence, which Garrison, Anderson & Archer (2001) define as "the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication." Cognitive presence is the interplay between reflection and discourse in the initiation, construction and confirmation of meaningful learning outcomes. Cognitive presence is operationally defined through the Practical Inquiry model that consists of four phases: triggering event, exploration, integration, and resolution. Indicators for each of these categories have been developed to aide in coding for cognitive presence (Garrison & Anderson, 2003). If a deep and meaningful learning outcome is the goal of an educational experience, then an understanding of cognitive presence is a priority (Garrison, 2003).

Teaching presence includes designing and managing learning sequences, providing subject matter expertise, and facilitating active learning. It is defined as 'the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes' (Anderson, Rourke, Garrison & Archer, 2001). Indicators for each of the categories have been developed for the purposes of coding for teaching presence in online transcripts (Garrison & Anderson, 2003). Garrison and Anderson (2003) emphasize the critical role of teaching presence to create a community of inquiry that includes both cognitive and social presence.

Collaborative activities are grounded in features of voluntary learning and respect for participants (Brookfield, 1987). Consistent with this, the third element of the framework, social presence, is essential in setting the climate for learning activities. The definition of social presence has been updated recently by Garrison (in press) as "the ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities." Indicators for social presence categories (open communication, cohesion, affective/interpersonal) were used to code the transcripts (Garrison & Anderson, 2003). Garrison and Anderson (2003) argue that social presence is an important antecedent to collaboration and critical discourse. Social presence supports cognitive objectives through its ability to instigate, sustain, and support critical thinking in a community of learners. Each element of the Community of Inquiry (CoI) framework has been substantially studied in different contexts by many researchers. However, there are few studies that have concurrently examined the dynamics

Figure 1. Community of inquiry model



of the three elements of the framework, either qualitatively or qualitatively (Garrison & Arbaugh, 2007). Previous studies explored students' perception of a community of inquiry and its elements and their impact on learning and perceived satisfaction (e.g. Rourke, Anderson, Garrison, & Archer, 1999; Garrison, Anderson, and Archer, 2001; Richardson & Swan, 2003; Meyer, 2003; Vaughan & Garrison, 2005; Shea, Li & Pickett, 2006; Hwang & Arbaugh, 2006).

Satisfaction is an important variable that has been studied to evaluate the effectiveness of online learning communities. One of the critical questions regarding the effectiveness is how online learning opportunities can provide a consistent level of satisfaction for students (Allen, Burrell, Timmerman, Bourhis & Mabry, 2007). Garrison, Cleveland-Innes and Fung (2004) claim that when all three elements (social, cognitive, and teaching presence) of a learning community are integrated harmoniously in a way that supports critical discourse and reflection, then satisfaction and success result.

Introduction of the CoI framework provided order to exploring how a community of inquiry is created and develops in an adult education context. We now describe the design and methodology of the study.

Methodology

A graduate course given in the fall term of 2007 was the focus of this study. The topic of the course was blended learning. The CoI framework not only provided the methodological framework but provided the structure for the content of the course (Akyol & Garrison, 2008). That is, it addressed issues of social, cognitive and teaching presence in terms of a blended learning approach. The course was delivered fully online using asynchronous and synchronous formats (i.e., Blackboard and Elluminate). Learning activities, strategies and assessment techniques were all developed to reflect social, cognitive and teaching presence. The major assignments were article critiques and peer reviews, weekly online discussions, and prototype

course redesign projects. In the first online discussion, the instructor modeled how to facilitate the discussion in an effective way. In order to distribute teaching presence among students and teacher, students were responsible to facilitate and direct the online discussions in each of the remaining weeks. Distribution of teaching presence through student moderation can attenuate the authoritative influence of a teacher and encourage freer discussion (Rourke & Anderson, 2002). The final assignment was a course redesign project where students incorporated understandings from the discussions.

It was assumed that development and progression of a community of inquiry will vary and the elements will have differing influences on learning and satisfaction over time. Therefore, the aim was to explore how the community of inquiry develops for adult learners as well as how the community of inquiry supports and moves adult learning toward intend goals.

Participants

There were sixteen students enrolled in the course. Fifteen students responded to the student consent form and accepted to participate in the study. Table 1 shows the summary of demographic information of the students obtained through the Community of Inquiry (CoI) Survey (Swan, Richardson, Ice, Garrison, Cleveland-Innes, & Arbaugh, 2008). There were six male and nine female students who completed the survey. The demographic data shows that all the students were over 30 years of age. Six students lived in the city of the university while most of the students lived in other cities and other states. One student lived in another country.

All the students were enrolled in a Master of Education graduate program. At the same time, all the students were part or full-time working adults. There were teachers in K-12 or high school, instructors at colleges, and instructional designers. Most of the students (12) had previous online/blended learning experience and some of them (8) had taken all their previous graduate courses in online/blended environments. Only three students had not taken an online or blended course before. With regard to their computer skills, six students indicated that they had intermediate computer skills while nine of them had advanced computer skills.

Data Collection and Analysis

Three sources of data were used to explore the research question – transcript analysis, interviews, and the CoI Survey. Transcript analysis was applied in order to code and explore posting patterns of social presence, teaching presence and cognitive presence based on category indicators defined in the CoI framework (Garrison & Anderson, 2003). The first author and a research assistant analyzed the transcripts by applying a negotiated coding approach (Garrison, Cleveland-Innes, Koole & Kappelman, 2006). The researchers coded two discussion transcripts of a previous online course to get experience and gain familiarity with the process. In the negotiated approach, the researchers coded transcripts and then actively discussed their respective codes to arrive at a final assessment of the code. Negotiation provided a means of on-going training, coding scheme refinement, controls for simple errors, thereby, increasing reliability.

A follow up interview was conducted with eleven voluntary students at the end of the term in order to provide detailed information about their perceptions of the community of inquiry in relation to their perceived learning and satisfaction. Each interview was conducted using Elluminate as most of the students were in different cities and they were familiar with the use of synchronous online meetings. Only one interview was conducted face-to-face because of the technical problems the student had with Elluminate. With informed consent, the interviews were recorded and were later transcribed. Data analysis was carried out

Table1. Demographics of participants

Age	Gender	Where they live	Computer Skills
20-29: 0	Male:6	Calgary: 6	Novice: 0
30-39: 8	Female: 9	Other city/Alberta: 4	Intermediate: 6
40-49: 6		Other state:4	Advanced: 9
50 or above:1		Other country: 1	

using constant comparative analysis method including three phases: open coding, axial coding and selective coding (Strauss & Corbin, 1990). Interview questions and the community of inquiry framework were utilized to develop and categorize the themes that emerged from the data.

The CoI Survey was administered at the end of the class to assess the relationships among the three presences and student perceived learning and satisfaction. The instrument was developed and initially validated by Swan and colleagues (2008). Cronbach's Alpha was 0.94 for teaching presence, 0.91 for social presence, and 0.95 for cognitive presence. The survey included teaching presence perception (13 items), social presence perception (9 items), cognitive presence perception (12 items), an item for perceived learning, and one item for perceived satisfaction. Fifteen students (out of 16) completed the survey.

Results

Perceptions of Community of Inquiry

The CoI Survey, transcripts and follow-up interviews were used to explore students' perceptions of the community of inquiry and its elements. Generally, it was found that most of the students had positive attitudes towards online learning and the community of inquiry developed during the course. The descriptive analysis of the CoI Survey indicated that students had high perceptions of each presence in the course. Overall perceptions of each presence were 4.15 for teaching presence, 3.94 for social presence and 4.07 for cognitive presence.

The main question asked to students in interviews was how they felt about the community of inquiry that was developed during the course of studies. Students' responses to this question confirmed the critical role of each element of the CoI framework as their perception of each element directly influenced their perception of the community of inquiry as a whole. Students' sense of a community of inquiry developed according to their sense of teaching presence, cognitive presence or social presence in the course. For example, if students did not feel sufficient teaching presence, or if they did not sense social presence, or if they did not think they could reach higher levels of critical thinking, they would have indicated that the community of inquiry was not developed sufficiently.

Teaching Presence

With regard to teaching presence, students generally indicated that they found teaching presence high and valuable in the course. They appreciated frequent communication, immediate feedback, availability, good balance on learning activities, good facilitation, correcting misunderstanding, and modeling the use of tools. However, seven students indicated that they could not perceive much teaching presence on the discussion board; they preferred to see more. Students' perceptions of teaching presence indicators in the course gathered from CoI Survey were consistent with what students indicated during the interviews. Students showed high perceptions of teaching

presence in terms of communication and feedback and relatively lower perceptions on the role of instructor on the discussion board. The latter would appear to be due to students having to take turns moderating online discussions.

The course design provided opportunities for students to share teaching presence by allowing them to lead and facilitate weekly discussions. Some students found this valuable where others found it difficult. The student who found the distribution of teaching presence among students difficult further explained that s/he could not interpret what others said as s/he did not know or could not meet them in person. S/he said "*if the instructors comes to the class and say 'you should do this, you should try this', most students have a tendency to take, to trust and believe he knows what he is talking about*." Another student indicated inconsistency in terms of course outcomes when different students facilitate the discussions every week. S/he stated that the outcomes for the discussions changed each time as the discussions focused on whatever the students come up with for the week. On the other hand, three students appreciated this strategy as it provided a new way to participate and contribute. One student stated that s/he enjoyed having a chance to facilitate the discussions and found it good in terms of her/his own metacognition, and in terms of providing better understanding. Similar to this comment, another student found this strategy as a mirror to show the difficulty and importance of facilitation.

In order to explore students' teaching presence in the discussion board, the messages posted by the instructor and guest speakers were excluded from the analysis. Facilitating discourse (mostly occurred as encouraging, acknowledging, or reinforcing student contributions) and direct instruction (mostly occurred as injecting knowledge from diverse sources) categories of teaching presence were coded most frequently. Table 2 illustrates the coding results for categories of teaching presence in terms of three week segments. Not surprisingly, considering that students had no control over the design of the task, design postings were virtually nonexistent. However, while facilitating discourse stayed more or less the same over time, interestingly there was an increase in the number of messages coded as direct instruction.

Social Presence

The analysis of the CoI Survey showed that students perceived social presence as reasonably high but relatively low compared to teaching presence and cognitive presence in the course. The items about feeling comfortable conversing through the online medium and participating in discussions were perceived the highest of the social presence indicators by the students. Students' perception of social presence varied during the interviews. Although most students expressed they found social presence good, there were some students who assessed the course as lacking social presence. One student emphasized respect and trust as key factors for social presence to provide a climate where people are willing to put themselves out there, willing to give their opinions, or willing to take criticism. He stated that in this course they could create a good climate in which the students respected and trusted each other and, thereby, felt comfortable discussing issues. Another student expressed that the social atmosphere was very supportive based on her/his experience in this course and previous experiences.

Social presence was analyzed in the transcripts by coding for affective/interpersonal expression, open communication and group cohesion. Table 3 illustrates the coding results for categories of social presence in three week periods. As seen in the table, the majority of the messages throughout the course were open communication. Compared to the other two categories of social presence, open communication refers largely to continuing a discussion thread. In this regard, this finding is consistent with the survey and interview results in that social presence was perceived mostly in

Table 2. Posting patterns of teaching presence

Teaching Presence	First 3 weeks of Discussion	Second 3 weeks of discussion	Last 3 weeks of discussion	Total
Design and Organization	0.6%	1.0%	0.0%	0.5%
Facilitating Discourse	28.1%	23.0%	24.7%	25.3%
Direct Instruction	18.5%	32.5%	37.6%	29.6%
No category detected	52.8%	43.5%	37.6%	44,6%

relation to online discussion. Another significant finding is that the percentage of group cohesion indicators increased over time.

Cognitive Presence

The analysis of the CoI Survey yielded high perceptions of cognitive presence in the course. Students perceived the items related to the resolution phase of the Practical Inquiry Model the highest; which means that most of the students agreed that they were able to know how to use and apply the knowledge and develop their solutions. The other items which were perceived highly were related to the triggering event phase showing that students felt motivated and were interested in the discussions.

Consistent with the survey results, during the interviews most of the students (8 students) indicated that they perceived cognitive presence to be very strong in the course. One student's comment was "*the cognitive presence was probably the best part, because the way the course was structured and designed, I felt like I was actually constructing my knowledge of blended learning as I was going through the course*." Moreover, two of them found too much cognitive presence compared to other presences. However, with regard to the categories of cognitive presence, some of them indicated that they needed more time to reach the resolution phase.

Students' comments about cognitive presence noted the importance of resources and learning activities in order to develop deep approaches to learning. They appreciated the good balance of resources and not being overloaded with content. They also found course readings to be relevant, interesting, forcing them to think critically, and encouraging them to do more research.

Cognitive presence was analyzed in the transcripts by coding for the triggering event, exploration, integration and resolution. Table 4 illustrates the coding results for the categories of cognitive presence over the three segments of time. As the distribution of percentages for each category of cognitive presence showed, the integration phase was the most frequently coded category of messages posted by students throughout the course.

Table 3. Posting patterns of social presence

Social Presence	First 3 weeks of Discussion	Second 3 weeks of discussion	Last 3 weeks of discussion	Total
Affective	34.3%	38.5%	24.7%	32.5%
Open Communication	58.4%	42.5%	43.0%	48.0%
Group Cohesion	7.3%	15.5%	19.9%	14.2%
No category detected	0.0%	3.5%	12.4%	5.3%

Table 4. Posting patterns of cognitive presence

Cognitive Presence	First 3 weeks of Discussion	Second 3 weeks of discussion	Last 3 weeks of discussion	Total
Triggering Event	14.6%	7.0%	8.1%	9.9%
Exploration	18.0%	29.5%	26.9%	24.8%
Integration	46.6%	45.0%	51.6%	47.7%
Resolution	6.7%	9.5%	5.9%	7.4%
No category detected	14.0%	9.0%	7.5%	10.2%

Perceived Learning and Satisfaction

A Spearman Rank Correlation Coefficient was conducted in order to explore the relationships among variables (teaching presence, cognitive presence, social presence, perceived learning and satisfaction). The analysis revealed significant relationships among perceived learning, satisfaction, and levels of teaching, social and cognitive presence. As shown in Table 7, there was a positively significant relationship between teaching presence and cognitive presence (r=.78, p=.001); between teaching presence and perceived learning (r=.55, p=.03); and between teaching presence and satisfaction (r=.63, p=.01). The implication is that students who perceived higher levels of teaching presence also perceived higher levels of cognitive presence, learning and satisfaction.

The correlation coefficients also showed significant relationships between cognitive presence and perceived learning (r=.67, p=.007) and between cognitive presence and satisfaction (r=.65, p=.009). This would appear to indicate that students who perceived higher levels of cognitive presence in the course also perceived higher levels of perceived learning and satisfaction. The analysis did not find a significant relationship between social presence and perceived learning but found a significant relationship between social presence and satisfaction (r=.54, p=038).

Overall, it was found that all three presences showed a significant relationship with students' satisfaction. However, only two presences (teaching and cognitive presence) showed a significant relationship with perceived learning. This finding indicates that students think that they learn more when they perceive sufficient levels of teaching and cognitive presence. Their responses to open ended questions in the survey were also consistent with this result. Responses related to how and which aspects of teaching, social and cognitive presence affected their perceived learning and satisfaction. Most responses emphasized the role teaching and cognitive presence had on their learning.

Students' perceptions of the impact of the community of inquiry as a whole and each element of the framework on perceived learning and satisfaction were further explored in interviews. With regard to the impact of sense of community on their learning, students indicated that it was particularly powerful for participation. One student indicated that he felt greater comfort in participating in course discussions. Another student compared the sense of community to reading paper material and sending in assignments in response and stated that "*the difference is, I've gotten to know the teacher and some of the students. I know that if I learn something I will be able to share it*." On the other side, two of the students who indicated that they did not feel a sense of community expressed that they learned a lot from the instructor and course readings.

In relation to the role of teaching presence on perceived learning and satisfaction, most of the students emphasized that teaching presence was

Figure 2. Relationships among teaching presence, social presence, cognitive presence, learning and satisfaction

Correlations

			Teaching	Social	Cognitive	Perceived	
Spearman's rhc	Teaching Presence	Correlation Coefficie	1.000	.182	.779**	.548*	.634*
		Sig. (2-tailed)	.	.517	.001	.034	.011
		N	15	15	15	15	15
	Social Presence	Correlation Coefficie	.182	1.000	.490	.463	.539*
		Sig. (2-tailed)	.517	.	.064	.082	.038
		N	15	15	15	15	15
	Cognitive Presence	Correlation Coefficie	.779**	.490	1.000	.666**	.650**
		Sig. (2-tailed)	.001	.064	.	.007	.009
		N	15	15	15	15	15
	Perceived Learning	Correlation Coefficie	.548*	.463	.666**	1.000	.504
		Sig. (2-tailed)	.034	.082	.007	.	.055
		N	15	15	15	15	15
	Satisfaction	Correlation Coefficie	.634*	.539*	.650**	.504	1.000
		Sig. (2-tailed)	.011	.038	.009	.055	.
		N	15	15	15	15	15

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

very important and valuable. One student stated that when the instructor was present, it definitely helped her/his learning because, as an expert in the area of blended learning, the instructor's presence let her/him know whether s/he was on the right track in terms of understanding the material. Moreover, eight of them emphasized the need for more teaching presence. Cognitive presence was emphasized as important for their learning by students. In particular, they indicated that learning activities and assignments were challenging and supportive of critical thinking and problem solving. One student explained the role of cognitive presence on learning such that *"...I think the cognitive presence comes down to what you actually do in terms of learning, in terms of projects and writings, and things like that. So I think it is very important to me that tasks should require some kind of critical thinking or problem solving."* With regard to the role of social presence on their learning and satisfaction, students' comments varied. Six students indicated that social presence was not an important aspect compared to teaching presence or cognitive presence for their learning or satisfaction. On the other hand, four students indicated social presence affected their learning.

Contextual Contingencies

Students' comments about their perceptions of the community of inquiry, each of the presences during interviews, and their entries in open ended questions in the CoI Survey also identified some barriers or limitations. Time was the main barrier identified by eight students. This was followed by class size, different background, and restriction on the number of postings.

Time was an important factor, especially for cognitive presence. First, students indicated that they needed more time for discussions. They assessed one week for each topic as insufficient for effective discussions. This factor was pointed out to explain why they could not reach the resolution

phase more often. One student's suggestion was "*I think if the discussions had a longer time period, we had one week for each discussion, I think if it was two weeks, maybe there would be a longer time for us to bring out our own ideas, start sharing with each other and learning, maybe come up with some others, form ideas and understand a little bit better through some more discussions*." Secondly, time was expressed in terms of being on time to post a message to the discussion board for cognitive engagement. Three students explained that when they were late in postings, pretty much of everything they wanted to say had already been said which made it difficult to become cognitively present. Thirdly, because of being busy in their lives, three students also indicated that they did not have enough time to do all the readings or be more active in discussions.

Class size is another barrier identified by five students for the development of a community of inquiry, particularly social presence. The students indicated that they felt greater social presence in small group activities such as peer critiques. One student compared this course with another course s/he had before in terms of class size effect on community of inquiry and said "*...Community of inquiry was much more solidified early in the course, I can say, it was a lot easier to follow the questions and the answers and the things like that. With the amount of people that we have now in the course, I find it a bit much."*

With regard to different backgrounds as a barrier, one student said "*the things I had to say maybe were not interesting for other people, so I've rather been unusual participant, I sort of felt like an outsider so the discussions, I do not think I made much of an impact on other people, I do not think I got as much from the discussions as from the other components of the course.*" Another student also stated that coming from a different field, she felt herself as being out of the loop and sometimes she found the online discussions hard to directly relate to her/his own area.

Regarding the restriction on the amount of postings, one student indicated that it affected the development of social presence based on her/his previous experiences. S/he stated that social presence was as good as one could get in this course but in some courses students are not supposed to post trivial things. When they were supposed to post just one-page, s/he found social presence restricted.

DISCUSSION

The adult education literature emphasizes community building in order to increase effectiveness and success of online teaching and learning. In this study, it was found that students had positive attitudes toward the community developed in the course and that their perception of constituting elements of the community of inquiry was significantly related to perceived learning and satisfaction. Previous research also indicates that sense of community is significantly associated with perceived learning (e.g. Rovai, 2002; Ertmer & Stepich, 2004; Shea, 2006; Shea, Li, & Pickett, 2006). In a study of how students sense online community, it was found that community was constructed and maintained as a necessary tool for the completion of tasks (Conrad, 2002).

Teaching presence plays a crucial role in arranging activities and setting the climate for the development of social and cognitive presence. Although the students expressed their desire to see more of the instructor on the discussion board, overall they were satisfied with the teaching presence and they perceived teaching presence high in the course. The interviews and survey indicated that they most appreciated the instructor's frequent communication and feedback. This is consistent with Ausburn (2004) who found that adult learners ranked highest the course design feature related to communication with instructor.

This study found a direct impact of teaching presence on perceived learning and satisfaction which was consistent with previous studies (Shea,

Pickett & Pelz, 2003; Shea, 2006). Shea et al. (2006) also found a clear connection between perceived teaching presence and students' sense of learning community. The transcript analysis showed an increase in direct instruction for the course, indicating that students started to inject knowledge from various sources. This finding is probably due to distribution of teaching presence among students which increased their contributions to the discussion forum. Rourke and Anderson (2002) also report that students preferred the peer teams to the instructor as discussion leaders. Many professionals emphasize the importance of de-authorization to further the self-directedness and self-authorship of the group and its members (e.g. Vella, 2002, Bruffee, 1999). Perry and Edwards (2005) found that students felt more motivated when the teacher-learner relationship involves a mutual learning experience. Sharing responsibilities could be seen as an advantage over what an individual teacher is able to offer (Kukulska-Hulme, 2004).

The CoI framework emphasizes collaboration. Collaborative activity and community building have important influences on each other. Collaboration supports the creation of community and community supports the ability to be collaborative (Palloff & Pratt, 2005). However, as Bruffee (1999) indicated, students may not work effectively as collaborative peers, especially at the beginning. Social presence in the CoI framework reflects the need to create a learning environment where students respect and trust each other and feel comfortable to participate. In the study reported here, the indicator of social presence reflecting the need to create a comfortable environment for discussion was perceived highest by students.

Another important finding about social presence is the increase in the group cohesion category over time. This would indicate that students sensed group identity and belonging to the community more as time passed. Rogers and Lea (2005) argue that the group will work more productively when the students identify with the group and they will feel more motivated. In this study, although social presence did not have an apparent impact on students' perceived learning, there is a clear connection found between social presence and satisfaction. The impact of social presence on satisfaction and perceived learning was also found in previous studies (Swan & Shih, 2005; Arbaugh & Hwang, 2006).

Cognitive presence is the core element necessary for higher learning (Kanuka & Garrison, 2004). Adult learning focuses primarily on modifying, transforming and reintegrating knowledge and skills (Mackeracher, 1996); therefore, the design of learning activities has crucial importance. Students also emphasized the role of learning activities and assignments on the development of cognitive presence. Vella (2002) points out the importance of immediacy for adult learners. She states that they want to see something in hand as soon as possible. Learners must be provided opportunities to apply what they have learned (Kanuka & Garrison, 2004). As most students stated in the interviews, the student's final project - redesigning a course into a blended format - enabled them to apply what they gained throughout the course. All of them redesigned a course that they could apply in their work or school settings.

Transcript analysis revealed that integration was the most dominant phase in the discussion postings and this increased over time. Previous studies also found that most of the postings on the discussion board were focused on exploration and integration (Meyer, 2004; Vaughan & Garrison, 2005). This was because of the collaborative nature of online discussion; students were able to create knowledge collaboratively by adding to each other's ideas, or integrating those ideas and information. Interaction is not enough for higher levels of learning (Garrison & Cleveland-Innes, 2005). Collaboration goes beyond simple interaction and, as such, it is argued that this is an effective means to create cognitive presence for the purposes of higher levels of learning (Murphy, 2004; Kanuka & Garrison, 2004). Meyer (2004)

also points out the nature of triggering questions can support progression into higher levels of cognitive inquiry. The activities which are well structured, provide clearly defined roles and responsibilities for the students, and which provoke the students to explicitly confront other's opinions have more potential to move students to higher levels of understanding and discourse (Kanuka, Rourke & Laflamme, 2007).

One of the important relationships found in this study was between teaching presence and cognitive presence. The role of teaching presence is to moderate and shape the direction of the discourse for a successful community of inquiry (Kanuka & Garrison, 2004; Garrison & Arbaugh, 2007). Stein and his colleagues (2007) also found that both social presence and teaching presence support the initialization and progression of cognitive presence. In the study reported here, the increase in group cohesion and direct instruction fed the progression through higher levels of critical thinking.

CONCLUSION

The developments in technology and increasing need for life-long learning makes online learning particularly appropriate for adult learners. This situation increases the recognition of the importance to design and develop better learning environments that can meet the needs of adult learners. Vella (2002) emphasizes that three aspects of learning, cognitive, affective and psychomotor should be considered in the design of adult learning. The main emphasis of the Community of Inquiry framework is to create an effective community that extends Vella's learning outcomes to include other elements (presences) that enhance and support learning. Building a learning community is valuable as it serves social needs as well as enhancing student satisfaction and learning through community involvement (DuCharme-Hansen & Dupin-Bryant, 2005; Palloff & Pratt, 1999).

The primary focus of this chapter was to introduce the CoI framework for adult online learning environments utilizing the research findings from an online course. A recent study has emphasized that epistemic engagement in which the students are collaborative knowledge builders is well articulated and extended through the community of inquiry framework (Shea & Bidjerano, 2009). The authors of this chapter argue that the CoI framework provides a well-structured guideline to create effective adult online learning communities by meaningfully integrating and combining teaching, social and cognitive presence. Taking into consideration the contextual contingencies such as class size or time, instructional designers can apply the CoI framework and approach to designing effective online environments for adult learners.

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Section 2

Web 2.0 Technologies, Adult Learning, and New Educational Possibilities

Chapter 7
Social Networking, Adult Learning Success and Moodle

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ABSTRACT

We know that technology is rapidly changing the world and it is hard to keep up. Social networking is the latest online trend we need to learn about. This chapter will consider the enormous changes that impact learners of all ages and offer some insights and resources for those professionals who want to provide more than just another lonely online learning experience. Social networking activities – including sites, blogs, chats, forums and wikis - are emerging to facilitate collaboration and knowledge sharing among adult online learners. The loneliness of the Web 1.0 is passé and the read-only, passive mode of adult learning is fading away. The term Web 2.0 has been used to describe all the new applications useful for a new collaborative or social approach to sharing and repurposing Web content to learn. Just as communities were important in prehistoric times, today online communities are an inherent and critical part of the Web learning experience. Implicit in most Web 2.0+ applications are social activities which help users network, share, create content, seek or research information, or contribute and interact with others. Youthful online learners are a driving force in this new social change, a change that adults can learn from and embrace. Our young Web users find technology is second nature and are unconsciously changing the paradigm of online learning as they communicate and socialize in a variety of new ways on the Web. Many adults are already following this trend. However, these ways of learning can only become mainstream only when many more adults who are responsible for adult learners learn to use the host of networking tools available. Moodle is an example of a popular open source application used

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successfully by many around the world. Understanding how to support collaborative online learning activities successfully can offer a huge leap towards greater online learning confidence, contribution and achievement. More is yet to come to change the paradigm of online learning and social networking in the future.

SOCIAL NETWORKING, ADULT LEARNING SUCCESS AND MOODLE

Social networking is not really a new trend. The idea of learning through communication and collaboration is an old one. From the very beginning, humans have always gathered in groups to learn, communicate and socialize in communities with common goals, needs and interests. It is no surprise then that we humans, as the technology evolves, are similarly developing the Web with the same driving, evolutionary forces. Today, this process is enhanced by new online learning technologies supporting what is the next step in the evolution of the Web, commonly known as Web 2.0 or higher. The previous Web 1.0 phase, which was about finding and reading information, has passed—we have evolved. Users everywhere who have Web access are now collaborating passionately on a variety of social networking sites. Web 2.0 users are searching, creating and interacting with others with common interests to fulfill intrinsic needs to self-improve, learn new information and collaborate with others who are enjoying common likes and experiences. An important difference is that today's collaborative, online activities encourage others to engage and participate actively, continually and happily in the creation and use of new knowledge, artifacts and performance. This trend is in contrast to passive acceptance of what others know and pass on without collaboration or retention.

WHAT HAPPENING ON THE WEB? SOCIAL NETWORKING, SOCIAL MEDIA AND WEB 2.0+

There is a huge curiosity about the social networking phenomena. This is a groundswell of using technology to revolutionize learning and communication, especially among young people. More and more users really want to know how all this stuff works, who's doing it and how. Adults are equally becoming more enticed by the new opportunities to collaborate and be part of groups with common goals and interests. Social networking activities – including sites, blogs, chats, forums and wikis - are emerging to support online collaboration and sharing between users/learners more than ever before. Children are eagerly leading the way for adults in this latest fascinating and evolutionary technology trend. The loneliness of the Web 1.0 is over. Web 2.0 is about using new applications offering a social approach to work in collaboration to generate, share and reuse content. These new kinds of social activities and networks spark passions and help users find information, interact, self-improve and contribute. A description appears in the Wikipedia. Retrieved July 15, 2009, from http://en.wikipedia.org/wiki/Web_2.0.

Social networking activities can offer many advantages towards greater more successful online learning. Educators need to understand the opportunities supported by the new Web 2.0 tools and resources, which help harness the power to interact, create and contribute. Social networking websites are used by millions of people to connect with others with common, passionate interests and goals.

Researchers are also curious about social networking. It comes as no surprise that social networking offers other various benefits or influences. For examples, researchers at Harvard Medical School and the University at California, San Diego found that positive social networking relationships can make us happier. Such moods (e.g., happiness) can spread among those connected socially. "Everyday interactions we have with other people are definitely contagious, in terms of happiness," says Nicholas Christakis, a professor at Harvard Medical School and an author of the study (2008).Retrieved July 15, 2009, from http://www.npr.org/templates/story/story.php?storyId=97831171 and http://christakis.med.harvard.edu/

In North America, young adults are especially fascinated with collaborative sites, such as MySpace.com and Facebook.com. Adults are joining online communities too. For example, adults who may want to join charitable social networks that focus on giving back can join the Care2 non-profit foundation at http://www.care2.com/. Other examples are social networks that support families, health, longevity, hobbies, business or educational interests. Classmates.com and LinkedIn.com are examples of two social networking sites that have quickly grown in the last few years to accommodate those with passionate, related interests who want to network to accomplish common goals.

Federal governments and the military are equally involved in social networking to exchange information and interests behind heavily secured networks. In other examples, it is likely that social networking will have an even bigger impact in upcoming years in direct democracy, especially in how citizens involve themselves, voice opinions about how they are governed--nationally and globally. Already in the 2008 election, we experienced the powerful influence that social networking has on politics.

In the past few years, we have seen significant growth in seeing how companies and organizations are deploying consumer Web 2.0+ social networking tools to reach their customer base, e.g., online learning about products. This is a trend that will gain momentum as today's young people join the workforce and get involved in global concerns. Most corporate strategies will be adding social networking features on their site letting their users create profiles and offering opportunities to connect with people with common interests. They will want to support their workforce who are used to online collaboration. Many believe that social networking will have enormous potential for changing organizations, e.g., talent management effectiveness.

According to Awareness Networks, a social media solution provider, the "number of organizations that allow social networking for business purposes has increased, it says, to 69 percent in 2008-up from 37 percent in last year's survey." Retrieved July 15, 2009, from http://www.wipplaw.com/business-social-networking.html

You can find a list of international social networking sites on the Wikipedia web site. Retrieved July 15, 2009, from http://en.wikipedia.org/wiki/List_of_social_networking_websites

Individual Differences Impact Successful Online Learning

An especially important aspect of social networking and the successful acceptance and use of Web 2.0+-style tools is how individuals may need to learn, communicate and socialize differently. In other words, each of us a learning orientation, depending on a different set of genetics and body of experiences that influence how each of us will use our brain differently in different circumstances. Each of us have differences that will impact how we learn and use the Web differently—different abilities, goals, interests, needs and expectations will impact the success of each social networking and learning experience.

Recent advances in the neurosciences in the last ten years have revealed the extraordinary and fundamental impact of emotions on the brain.

Emotions impact how we learn, communicate, socialize and set goals to live our lives. Theories about how emotions impact cognition, learning, memory and intention integrate biology with the more traditional psychological and educational aspects. Such neuroscientific theories propose new research foundations and explanations for individual differences and the important impact of emotions, values, intentions, and social factors on measuring and improving learning skills. These new theories will also help us understand how social networking technologies are changing our brain, especially our abilities to communicate, learn and innovate more successfully.

You can find examples of this research in Art of Changing the Brain: Enriching the Practice of Teaching by Exploring the Biology of Learning (Zull, 2002). Another example is Synaptic Self: How Our Brains Become Who We Are (Ledoux, 2002). Newer books that echo this same research are: Brain Rules: 12 Principles for Surviving and Thriving at Work, Home, and School by John Medina and The Brain That Changes Itself: Stories of Personal Triumph from the Frontiers of Brain Science (James H. Silberman Books) by Norman Doidge.

Based on these recent advances in the neurosciences, Martinez' learning orientation research (2001a, 2001b) provides information about individual learner differences. This research describes how learners think, socialize and approach life differently (learning, goal-setting, risk-taking, setting expectations, etc.) and uses three attributes to suggest reasons why, including independence or autonomy, self-motivation and strategic effort. Retrieved July 15, 2009, from http://www.trainingplace.com/source/research/. The neurosciences help to describe a comprehensive set of neurotransmitters in the nervous system that influence or alter these states to influence choices, learning, communication and social networking. Martinez' research demonstrates how some individuals may find it difficult and stressful to even use a computer for online learning much less sign on to a social networking site without an effective guidance and support system. Others may be good at using one type of collaborative tool but may find it overwhelming or frustrating to have to learn to use a wide variety of resources. Others might get angry if they have to do too much work in a site that does not interest them. The neurosciences and the learning orientation research can help educators understand individual differences and the reasons why some interventions and instructional strategies work better than others in social networking or online learning situations.

Unfortunately, too few educational studies explore how people interact with the Web and use online collaborative tools differently. However in areas such as Neuromarketing (a way to study the brain's responses to marketing stimuli), you will find much more research about individual Web use. Neuromarketing strategies explore how individual users create content, join communities and choose transactions, products and activities. Neuromarketing is a hot topic. An example is how Carnegie Mellon used brain scan research to study how consumers buy products. Retrieved July 15, 2009, from http://www.cmu.edu/news/archive/2007/January/jan3_brainscans.shtml.

Similarly in education and social networking, we need to explore the triggers that influence how learners anticipate, learn, commit and persist. We need to identify and better understand emotions, learning dynamics, relationships, and instructional strategies that provide more personalized, supportive solutions in a more social online learning experience. Tapping into emotions will help individuals make the connections that translate into improvement, progress and achievement. There is a growing body of neuroscientific research and evidence that suggests that each of us are differently influenced by various factors, such as maturity, gender, brain agility, learning, memory and communication ability, exposure to technology, life experiences, facilitation. Such factors are also influenced by an individual's ability to set goals, embrace change and take risks. Working

against each of us are negative states, such stress, anxiety and frustration, which are detrimental to the learning and social networking experience. The neuromodulation research demonstrates how these negative emotions act as barriers to learning and communication and can impede progress to communicate, network and strive for self-improvement. Fortunately, these same negative states can shift into more positive states, such as anticipation, exhilaration and satisfaction, with sufficient guidance and support (e.g., using social networking tools and facilitation).

Not all educators embrace social networking tools. Many think such tools are a distraction and not supportive of academic goals. However, the growth of social networking technology demonstrates that many young people are very adept at embracing the innovative social changes introduced by technology. While education might have traditionally underestimated or ignored emotional and social aspects of learning, many young people today seem to be enthusiastic about getting it right. Put an interested kid on the Web with a MySpace account and you will probably not have to worry if he/she will learn how to use the computer or the social networking site. With the combination of enthusiasm, reward and social networking, his/her positive states are aimed at learning very quickly. Educators who can expertly tap into happy, engaged emotions in a supportive social networking environment have a powerful advantage, especially in addressing the individual needs of the learner and helping them with lifelong successful learning experiences.

Fortunately in education, Moodle is just one of the social networking applications that has already changed online learning as we know it today. Moodle helps educators create, deliver and manage online courses. Moodle (Modular Object-Oriented Dynamic Learning Environment) offers many social networking tools, resources and activities to support opportunities for rich interaction and especially how people want and intend to learn differently.

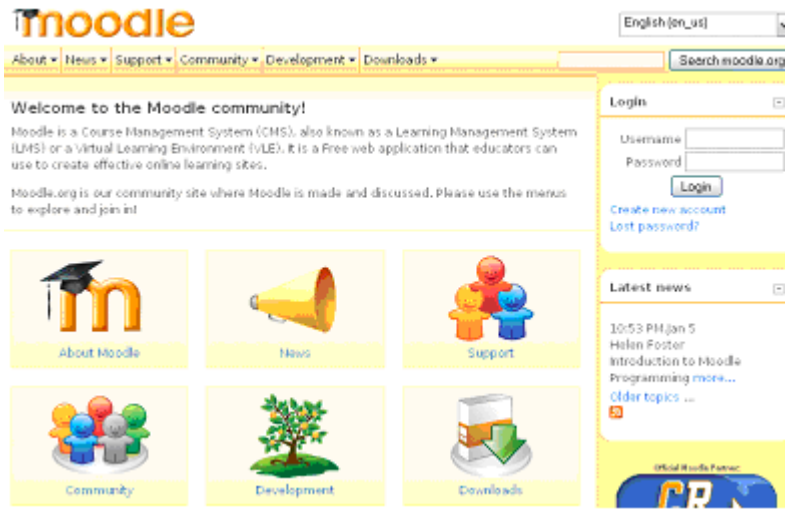
Learning and Social Networking with Moodle

Moodle creator Martin Dougiamas, a WebCT administrator at Curtin University, Australia, began working on Moodle to support his dissertation about using "open source software to support a social constructionist epistemology of teaching and learning within Web-based communities of reflective inquiry" (Dougiamas, n.d.). While the dissertation remains unfinished, this research has strongly influenced the development of Moodle. Of particular importance, Moodle supports pedagogical aspects and constructivist and social constructionist activities. These types of considerations are often missing from similar learning and course management applications. The Moodle approach emphasizes that learners and teachers alike can contribute and experience learning using a variety of social networking resources and activities.

Moodle is an open source (free) course management system supported by a global community of developers, professionals and educators who are very passionate to improve the interactive online learning experience based on sound pedagogical principles. Also often called a Learning Management System or Virtual Learning Environment, Moodle's open source license means that anyone can develop additional functionality and offer the new solutions back to the international Moodle community.

Increasingly, many schools, organizations and businesses around the world are meeting their online learning and social networking needs with Moodle. The Moodle community is global, rapidly-growing and eager to help with development, implementation, use and course creation. Introduced in 1999, Moodle has deeply penetrated K-12 and higher education and is now supporting the needs of corporations, especially small businesses. In 2006, the Moodle community reported over 22,000 registered web sites offering close to 900,000 courses to over 9 million users.

Figure 1. Moodle site at http://www.moodle.org



In less than 3 years, Moodle has multipled its user base with 35,437 registered sites with 24,396,163 users. Retrieved July 15, 2009, from http://moodle.org/stats/. It is easy to see that Moodle has enjoyed tremendous growth in the past few years. Moodle's international appeal is that it helps users create cost-effective online learning and social networking communities in different languages throughout the world; in rich and poor countries alike. Moodle's popularity also stems from the academic community's values of freedom, peer review, and knowledge sharing.

Typically in large organizations, institutions and corporations, Moodle use is restricted to departmental, divisional, or experimental use, particularly because of the lack of IT acceptance and Moodle's non-support of ERP, HR and other business processes. However, Moodle Partners (http://www.moodle.com) suggest that Web Services and W3C standards (e.g., SOAP and XML-RPC) strategies are successfully able to support the enterprise-wide needs of larger organizations. Many Moodle partners are available to offer a variety of corporate features to enhance Moodle capabilities. Whether you work in education, government, or the corporate sector, you cannot ignore Moodle's penetration into the LMS market. While Moodle isn't about to replace the more expensive proprietary enterprise-wide products like Saba's Enterprise or SumTotal's TotalLMS, the global community is using and enjoying Moodle a lot.

Worldwide institutions are deploying Moodle sites on a very large scale. A good example of a large Moodle implementation site is the Open Polytechnic in New Zealand. They have deployed Moodle across eleven polytechnics and three universities, along with several Government departments and a growing number of schools. In 2007, the Open Polytechnic of New Zealand won a prestigious $100,000 award from the United States-based Andrew W. Mellon Foundation. "The annual Mellon Awards for Technology Collaboration recognizes the work done by not-for-profit organisations globally in the field of open source software development and collaboration." Retrieved July 15, 2009, from http://www.icde.org/oslo/icde.nsf/id/DE27144682EDC2AEC12573A0003B8C71?OpenDocument. Their site appears at: http://campus.openpolytechnic.ac.nz/moodle/.

In the UK, according to government-funded

2006 OSS Watch Survey, Moodle was the LMS of choice for 56% of UK institutions. Retrieved July 15, 2009, from http://www.oss-watch.ac.uk/studies/survey2006/. Recently the Open University has announced a $7.39 million OpenLearn initiative that offers 900 hours of e-Learning available on their new Moodle platform for over 180,000 learners. Canada's Open University, Athabasca University has switched to Moodle for developing an effective learning management system that serves over 30,000 users for eleven undergraduate and graduate courses.

Similar developments have taken place in several countries ranging from New Zealand to Iceland, from China to Spain as a means of minimizing costs while maximizing reach. Developers, especially at large sites, are very adept at integrating Web 2.0 components into Moodle and expanding the platform to incorporate a larger variety of potential learning activities and learner engagement.

MOODLE'S 'SOCIAL CONSTRUCTIVIST PEDAGOGY' ENHANCES TEACHING AND LEARNING FOR ADULTS

Moodle's online learning innovations excite innovative educators. At its core, Moodle is educational software grounded in a philosophy of collaborative learning, often referred to as social constructionist pedagogy. In this approach, learning is viewed as much a creative, social process as it is an individual one, where people learn together by investigating, analyzing, collaborating, sharing, reflecting and drawing lessons. Perhaps this is a key reason why it has such a rapid uptake among the educational community.

Moodle developers put in core elements (e.g., tasks, activities, resources and tools) that encourage people to learn and develop understanding together by embodying pedagogical principles, including:

- Effective learning takes place when learners are actively engaged in constructing knowledge (i.e., creating or doing), rather than passively reading, memorizing or viewing
- An inquiry- and discovery-based approach is an effective way to learn
- Learners learn better when knowledge is chunked and structured according to a predefined segmentation, e.g. required and optional readings, key messages and in-depth content.
- Observing and interacting with our peers and the community is also crucial for learning and retention
- Collaborative environments encourage participants to be both teachers and learners at the same time
- Learning environments need to be flexible and adapt quickly to satisfy often rapidly changing learner needs
- Creativity and innovations are sparked (emotional appeal) when everyone has an opportunity to engage, contribute and exercise voice and participate

The organization and design of Moodle's interface is to support the learner and the online learning tasks and not technology and the tools. As an organizing framework, Moodle offers a choice of three different course formats to cater to a variety of eLearning experiences. For example, you can organize your course materials using the traditional Topic format, or a Weekly format, in which you organize content chronologically week-by-week, or even a Social format, which is less formal and more discussion-focused.

In terms of features, Moodle has all the standard features of LMSs that support a content-driven learning model (i.e., tools for course structuring, presenting text and multimedia, interactivity, quizzes, and assessments). Figure 2 shows a partial list of available collaborative activities. In addition, Moodle provides a suite of tools to promote

interaction and social networking among people by sharing ideas, collaborating in small groups, discussing, and reflecting on experiences (and thereby meets the pedagogical principles summarized in the earlier paragraph). Discussions and dialogs are at the heart of effective online courses, and Moodle supports these through three standard channels of communication: Discussion forums (an asynchronous, public way of sharing thoughts), Chats (a more immediate and simultaneous conversation with groups) and Dialogues (a private channel between two or more people). Research indicates that learners remember only 10% of what they read, and about 50% of what they discuss, proving that these are more effective forms of learning.

In addition, Moodle offers teachers and course designers a toolbox full of powerful, interactive online teaching tools based on Web 2.0 collaborative technologies. A few of these tools that promote new channels of communication, and collaboration are described below.

- The use of online journals encourages participants to reflect on the course and content, to experiment in a safe haven, and to stimulate deep thinking and learning.
- Blogs are relatively new in Moodle and therefore is not as feature-rich when compared with other blogging platforms. However, since blogs for learning are growing in importance, you will definitely see major improvements to blogs in future versions of Moodle. Even in its current form, there is plenty of room for creative applications for blogging in Moodle. Some ways learners can use blogs include: to reflect on new learning, to express opinions, comments on topics, and to share and discuss course related resources, activities, projects. Teachers also find blogs useful to post course information, examples of student work, build a class newsletter, link to another class worldwide, and even to reflect on teaching experiences and offer insights.
- The simple, flexible nature of Moodle wikis makes them a powerful tool for collaborative work. Wiki, which means quick in Hawaiian, is a type of free, on-line writing space where content can be created, edited and viewed by a community of users. The best example of wikis is the Wikipedia (www.wikipedia.org) which is a free, multilingual web-based encyclopedia with over 12 million articles written collaboratively by volunteers. Moodle wikis offer a quick way for learners to collaborate and

Figure 2. A list of collaborative Moodle activities

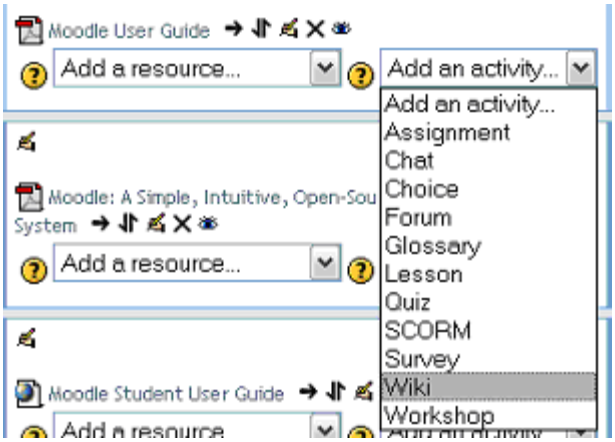
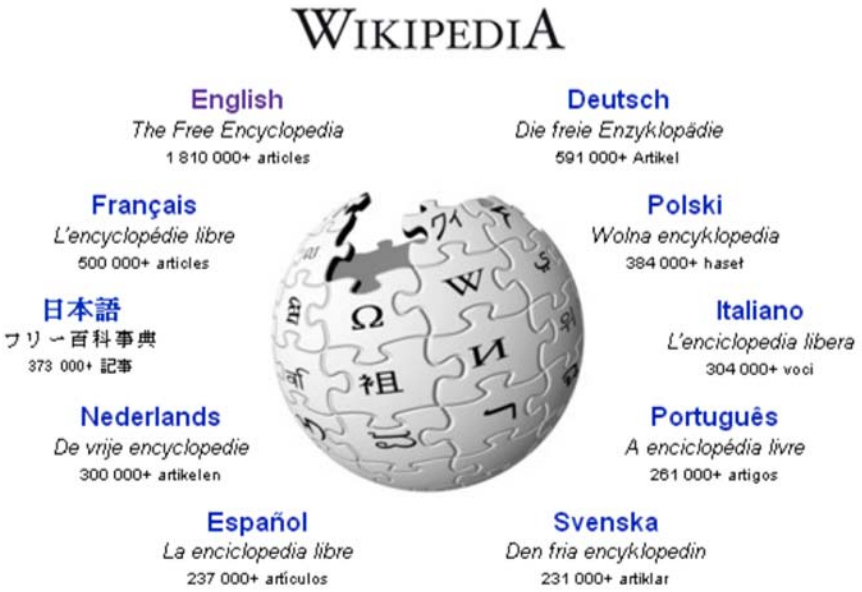


Figure 3. Largest WIKI – Collaborative encyclopedia edited by anyone in real-time (Wikipedia® is a registered trademark of the Wikimedia Foundation, Inc., a non-profit organization.)



share ideas textually, while creating a content rich web site. Here the knowledge of the group is greater than an individual, and the end product is the result of the group's interactions. Learners can collaborate to summarize readings or lectures; brainstorm initial thoughts on new ideas, topics, or technology; investigate the authenticity of a topic, e.g., on Wikipedia; collaborate on group projects (where each person contributes a piece); create e-portfolios; and participate in group authoring of presentations, reports, papers and research papers. Computer-savvy users in the teaching community find wikis useful to collaborate on a syllabus or learning materials. Wikis offer huge potentials for building community collaboration and team solutions.

- Glossaries in Moodle help learners internalize the vocabulary of the field by creating definitions collaboratively and negotiating their meanings for common understanding and use. Beyond vocabulary, glossaries can also be used for other brief learning material, such as stories, tips, quotes, examples, and frequently asked questions. The key advantage of a Moodle glossary over a web page it is that its constant presence on the sidebar making it easily accessible from anywhere within the course.

By facilitating the use of various types of multimedia (such as audio, video clips, simulations) as well as a learner-centered approach, Moodle caters to adults with different learning preferences. Also, providing timely feedback and responses to adult learners is important to improve the effectiveness of learning. Moodle allows teachers and learners to provide both quantitative (via grades and reports) and qualitative (via scales that can be customized) feedback for nearly all activities and modules. Moodle features that support reflection address an important criticism of e-Learning compared to traditional face-to-face

classrooms. For example, the Assignment module (in which learners can upload their work in any file format), allows the instructor to provide detailed comments in text as well as audio formats. This is true of Discussions, Journal and many other modules, in which feedback and reflection can be encouraged, restricted or made accessible to all participants.

In summary, via the tools and functionality described above, Moodle capably support adult learners. This fits Malcolm Knowles (http://en.wikipedia.org/wiki/Malcolm_Knowles) theory of andragogy, which suggests that adult learners are more autonomous and need the freedom and resources to direct themselves. They know their goals and abilities and they need to be able to connect to their own experience. Typically, adults must see a reason for learning something and then apply new knowledge that relates to their life, e.g., work life.

If you want to learn more about how to use social networking tools in Moodle, you can explore the following links resources for educators:

- Moodle Teaching Techniques, William H. Rice, Packt Publishing, 2007
- Using Moodle, Teaching with the Popular Open Source Course Management System, Jason Cole, Helen Foster, O'Reilly Community Press, 2007.
- Useful Resources for Moodle Users. Retrieved July 15, 2009, from http://www.ibritt.com/resources/moodlethings.htm

Moodle, like most Web 2.0 tools, are not without some limitations. Some key concerns are described below:

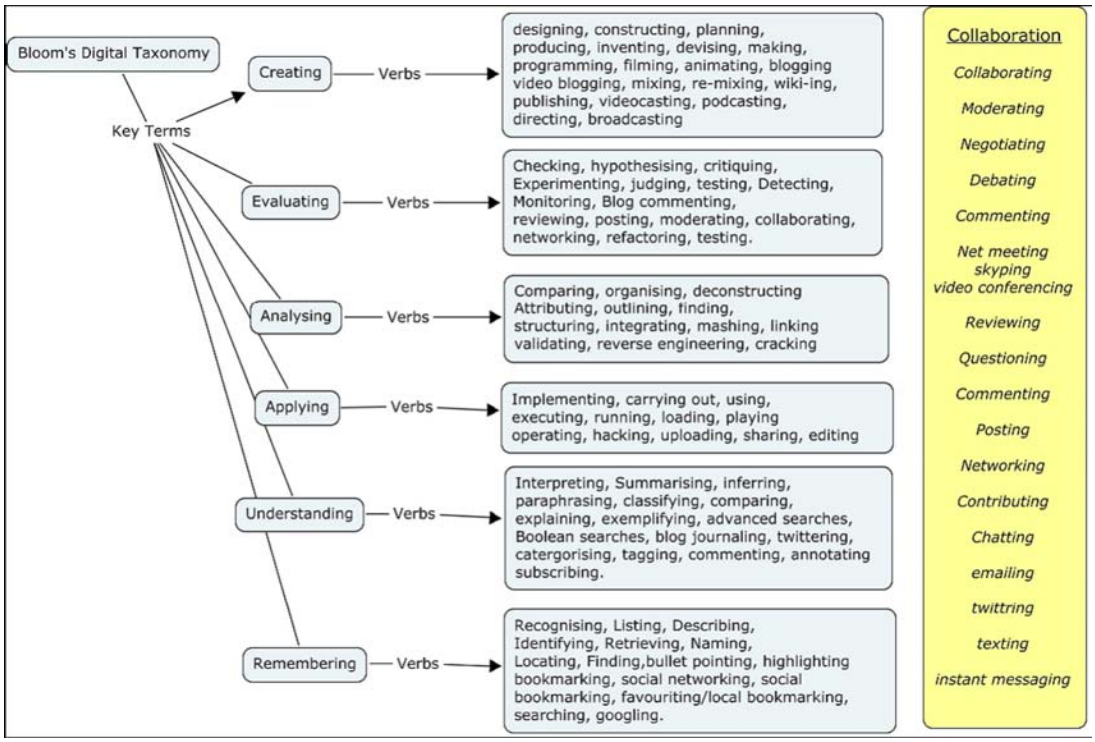
- Vandalism and spam concerns could reduce credibility
- Culture of collaboration needs to be passionately promoted by champions offering incentives in support of common interests
- Inherent intention between control of content vs. freedom to collaborate and innovate
- Privacy issues
- Participants may potentially create legal complications by failing to respect intellectual property rights

Moodle and New Literacies for 21st Century Education

The increasing importance of collaboration for learning in the 21st century can be seen in the recent update to Bloom's taxonomy which factors in the new collaborative behaviors, literacies and new online learning opportunities that arise out of the advances to educational technologies (especially those associated with Web 2.0). As illustrated below, the updated Blooms taxonomy by Arthur Churches includes a digital component that maps out cognitive elements as well as the methods and tools that a teacher would use in the classroom. Such collaborative experiences that facilitate higher-order cognitive process are often facilitated by a variety of digital media increasingly available in Moodle and other CMSs/LMSs/LCMS.

The impact of these Web 2.0 collaborative technologies on adult education is going to be huge, especially for the next generation. In addition to Moodle, just about every new software application that is available today has such tools built in –often free, open source and easy to use. As Will Richardson (2006) puts it "teachers will be using Web 2.0 tools like blogs and wikis and the like in ways that are transforming the curriculum and are allowing learning to continue long after the class ends. They are tapping into the potential of the Web that is a conversation and not a lecture, where knowledge is shaped and acquired through a social process, and where ideas are presented as a starting point for dialogue, not an ending point" (pp. 126). What we have now is a read/write/collaborate Web, which will continue to evolve and grow in the coming years (Richardson, 2006, pp.

Figure 4. Blooms digital taxonomy - Drawing by a churches created using C-Map Tools (© 2008 Andrew Churches. Used with Permission)



126). As educators, we must use the new tools creatively to enhance teaching and learning for future success. To be effective, the role and abilities of adult learners too will need to change to include the new literacies. Learners must learn to be active consumers of information on the Web, be able to articulate and publish their ideas and thoughts online, be adept at working collaboratively with others in virtual environments and also be able to manage vast amounts of information. For adult learners this is a challenge.

FUTURE TRENDS FOR MOODLE

Work is now ongoing for Moodle version 2.0 (Expected late 2009). Follow Moodle's roadmap. Retrieved July 15, 2009, from http://docs.moodle.org/en/Roadmap and Moodle news at: http://moodle.org/mod/forum/view.php?id=82 to monitor upcoming changes. Some changes expected very early in 2009 are:

- File handling improvements
- Conditional activities - allows dependencies and forced paths through activities, e.g., "You can't do this thing until that thing is completed"
- Learner plans and competencies - individuals can have learning plans which are updated when courses are completed
- Improved HTML editor 2.0
- Community hub interfaces – makes it easy for users to find and navigate other systems and external Moodle repositories, leveraging the Moodle Network in various ways. Unit tests (mock db), and remove the need for slashes in user space.
- Feedback module – cleaned up and included as a core module.

- Improved Wiki module (nwiki) - cleaned up and included as a core module. Nwiki is a wiki engine designed to be part of a LMS.

As a supportive adult learning and social networking environment, Moodle seems to be meeting the needs of a very diverse international group whose members depend on sophisticated activities and resources to change education to a more active, social networking and collaborative experience. They see using Moodle to focus on learners and how they learn. It will be fun to sit back and watch the future unfold. Will the number of Moodle sites again double by this time next year or will Moodle be just another passing trend? And, will Moodle keep pace with the trend for a more intelligent, learner or user-centered Semantic Web?

CONCLUSION

Kids are leading the way with the new social networking and technology changes. Our younger generation is having a huge impact as they indulge in the very natural human need to share, collaborate, learn and contribute together as a group with common needs, interests and experiences. Young people are not only familiar with virtual worlds but will expect to access their information and develop their relationships with Web 3D environments.

As a result, adult online learning is also rapidly changing as the technology and trends are changing. Discussions about social networking and Web 2.0 tools are already evolving into Web 3.0 or the Semantic Web discussions. Terms like business and student intelligence and new literacies are also commonly accepted terms. These new developments will "collectively comprise what might be called 'the intelligent Web'—such as those using semantic web, microformats, natural language search, data-mining, machine learning, recommendation agents, and intelligent tutoring using artificial intelligence technologies—which emphasize machine-facilitated understanding of information in order to provide a more productive, intuitive and more personalized or individualized user experience." Retrieved July 15, 2009, from http://computer.howstuffworks.com/web-302.htm.

And already, futurists are discussing Web 4.0. Web 4.0 is still a hazy vision about personal intelligent agents. Retrieved July 15, 2009, from http://blogs.zdnet.com/BTL/?p=4499. "The Semantic Web is an evolving extension of the World Wide Web in which the semantics of information and services on the web is defined, making it possible for the web to understand and satisfy the requests of people and machines to use the web content. It derives from World Wide Web Consortium director Sir Tim Berners-Lee's vision of the Web as a universal medium for data, information, and knowledge exchange. Retrieved July 15, 2009, from http://en.wikipedia.org/wiki/Semantic_Web. It is important to note that these more sophisticated Web technologies have another important impact. As the technologies evolve, complex security threats and privacy, legal and ethical issues will emerge and need to be addressed.

Predicting what the Web will be like in ten years is very difficult. What is clear is that the Web will continue to change the way we teach, learn, work and socialize. More importantly, there is a rapidly growing understanding that the many behaviors are being influenced by social networks and other evolving technology in ways that we have not fully researched or addressed. Social networking is an area where researchers in many disciplines need to ramp up quickly to keep pace with our younger generation. There is less than a ten-year window where universities and corporations will need to develop more intelligent Web 3D learning environments. Environments that are personalized and reactive to individual needs of users and groups of users will become an essential part of the technological learning infrastructure. Within the next five to ten years, a corporation without an intelligent technology,

and virtual world presence will be losing market share rapidly.

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Chapter 8
Collaborative Learning:
Knowledge beyond the Peripheries

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ABSTRACT

Learning is considered as one of the potential tool to empower a community. Over the past three decades, technology mediated learning has been recognized as an alternate channel replacing/ supporting/ strengthening the traditional forms of education in various forms, especially with the advent of interactive and collaborative learning. Open and distance learning (ODL) emerges as a potential means of enhancing educational access. On the other hand, open educational resources (OER) emerge as a potential material of this new paradigm of knowledge acquisition process. However, the organizational learning at the peripheries and capacity development at the grass roots remain almost unattended, despite recognized global efforts under many bottom-up empowerment sequences. Social components at large within the transitional and developing economies remain outside the enclosure of universal access to information and thus knowledge to equitably compete with the global knowledge economy. Keeping all these in mind, in a tiny spike, a program has been initiated in a rural corner of Bangladesh to enclave grass roots communities as part of the life long learning processes. The members of the society will be given traditional and non-traditional education, depending on their demands, aspirations and capabilities through a technology mediated educational institution. By clustering them into smaller groups, a micro-credit program will run to empower them economically and socially. Different categories of project (education, health, environment, technology) will run throughout the year for their skill development and knowledge building. Furthermore, adopting appropriate technologies, like introduction of solar power (cooking, water logging, lamps, machineries), wind mills (water logging, electricity) community people will be assisted to carry out their tasks rapidly and easily with limited impact on

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the local environment and resources. Finally, the surrounding communities will be taken under a Wi-Fi mesh to form a knowledge building network (continued education, self employment, information bank, data mining, improved livelihood, capacity development, market research, food security, basic health promotion, social development, increased governance and sustained advancement) with the intention to propagate knowledge beyond the peripheries.

INTRODUCTION

Learning nowadays are not only comprise of traditional brick-and-mortar classroom sessions, but also encompasses advanced computer assisted collaborative learning and peer learning (Roberts, 2004; Tu, 2004) that support education and research. Furthermore, Internet has allowed the learners and education providers to reach out the sky as the limit in designing, understanding and taking knowledge acquisition processes through various learning techniques. In addition, as classrooms do not remain enclosed to confined peripheries anymore, and the learners do not confined to regularly attended students anymore. Anyone, with capability and acceptability can attend a learning session at any time in sequel of his/her career.

Despite huge benefits of collaborative learning and being widely known, this learning technique is rarely practices till date. Benefits of collaborative learning facilitates education, research, social cohesion and psychological stability, thus building self-esteem, reducing anxiety, encouraging understanding of diversity, fostering relationships, stimulating critical thinking, increases student retention and encourages group learning (Panitz, 1997; 1998).

A country in South Asia with 141.822 million populations living in 147,570 Sq. Km in a deltaic region faces regular natural calamities like, flood, tsunami, draughts, and tidal weaves. This country, Bangladesh has a literacy rate of 51.6[1] and a lone distance education provider, the Bangladesh Open University (BOU). In spite of potential acceptance, government support and huge demand at the grass roots, BOU could not able to create sufficient scope to facilitate this huge population base. However, there are a few NGOs who are working relentlessly in this sector. BRAC[2] is one of them. This NGO (the largest in the World) is providing primary (pedagogy and non-formal[3]) through over 50,000 village schools and contributing largely to increase the literacy rate. Government has also taken several female student literacy programme[4] since 1993 and included special incentive based programme where female students are given free studentship till grade 12.

In spite of all these, it is a surprising fact that the drop out rate at primary level remains at around 30%, while it increased to over 50% at secondary level. Hence, there are immense scopes of conducting mass scale literacy programme up to the primary level leading to secondary level, reaching out the grass roots population. Furthermore, with 450,000 Internet users as of August, 2007[5] (0.3% of the population, according to ITU[6]) Bangladesh is lagging far behind the World class standard in the technology arena.

To uphold the goals of Education For All (EFA)[7] and Millennium Development Goals[8] a programme was initiated in early 2000 with the assistance of the World Computer Exchange, USAID and UNDP. It was a component of the Sustainable Development Networking Programme (SDNP), a UNDP funded programme through which the project tried to put forward several components. Education and capacity development were among them. The others include, establishment of multipurpose village information centers, establishment of public use cyber centers (pioneer in Bangladesh), establishment of content based web portal/ information bank/data bank for common use, establishment of the longest Wi-Fi based radio

link connecting several organizations including the largest Agricultural University, establishment of a national Internet exchange, hosting of the F-root server in Dhaka, and various other innovative projects with novel concepts and ideas.

The next section will outline the background detail of the main subject matter of this title and focus a bit on activities of SDNP in several topics that match the theme of the book. In the main thrust section this case study chapter will specifically focus on a few project components. Before conclusion, it describes about the transformation of the UNDP funded project to a civil society action programme and finally it put forwards a few recommendations for carrying out future activities of the SchoolNet Foundation.

BACKGROUND

Technology offer opportunities to transform learning system, but by itself it is not necessarily going to direct better outcomes for common citizens. This transformation process needs to be linked to various other perspectives, as such, design of a pragmatic learning system, execution of it, and up-gradation of the system as per requirement of the society, especially emphasizing the role of technology. In this context, not only Governments but also all the relevant stakeholders or actors should come up with a better strategy or approach. There must be some kind of consensus, to uphold the benefits of ICT for knowledge development of common people. Collaborative learning is one of them, through which common members of the community can be incorporated in knowledge acquisition processes and thereby overall society development. Furthermore, it has been observed that the bottoms-up approach increases the adaptation sequences in the learning processes that emerge out of a demand driven environment (e-Asia, 2007; Panitz, 1997; Panitz, 1998; Thomas, Howell, Patricia & Angelo, 2001; Venkatesh & Small, 2003; Boud, Cohen & Sampson, 2001).

Following those contexts and consequences, multi-channel delivery systems are always better and should be adopted in the learning processes. In terms of providing higher education through quality digital content has perpetually remained challenge to the academics and researchers, especially when they are being used in open technology platform with interoperability. Moreover, for promoting quality learning through collaborative approach demands formation of appropriate content repositories, geographically inter-connected distributed databases, user friendly access tools, online forums, knowledge banks and interactive but easy access (e-Asia, 2007).

However, in terms of providing collaborative learning for empowering community people, especially in developing countries would require more than the technology itself, but various aspects of social, cultural, economical and political determinants. These require inquisitive and innovative researches incorporating intricate nature of human behavior, socio-economic pattern and adaptability to new technology, cultural diversity, and above all availability of easily understandable learning methods. Therefore, building knowledge along the peripheries of either the social system, or the geographical boundaries would remain challenge for the next many years to come (Salomon &Perkins, 1998; Gardner, 2002).

In Bangladesh, the challenges remain the same for promoting collaborative learning, if not falling more on the rough track, especially when it come to serve remotely located low literate communities living in nearly accessible environment. SDNP took it as challenge. As the pioneer, in promoting benefits of ICT in the social development processes, the project has taken several grass roots activities, including telemedicine, tele-education, and capacity development.

Established in 1998, the project (SDNP, www.sdnbd.org) started its operation literally from December 1999 and it launched several innovative programmes in Bangladesh. The first component

was launching of free cyber centers at public places (July 2000), and with the assistance of the National Press Club the project opened about 15 cyber centers throughout the country (between 2000 and 2004). Establishment of local content based web was another milestone of this project (http://www.mdgbangla.org/). Later on the project started building its own information infrastructure to link several educational institution and build agricultural information based network comprising those institutions and local NGOs, that evolved as multi-purpose village information centers (MVICs, http://www.sdnpbd.org/sdnp/mvic/). Among others, establishment of the first Internet exchange (in 2004) in Bangladesh (http://www.bdix.net/) was another achievement of SDNP and this exchange is emerging as the national data center, as it also hosted the F-Root server.

As the project (SDNP) closed its operation in Bangladesh in December 2006, the project has been transformed into a Foundation, namely the Sustainable Development Networking Foundation (SDNF) in January 2007. SDNF kept a few of those initiative intact and looking forward to continue their operations as long as they can sustain. However, to keep the educational and capacity development activities getting forward, another initiative has been established following the international pattern of SchoolNets, and SchoolNet Foundation has been started its operation in Bangladesh since January 2007.

SchoolNet Foundation would like to carry out the continuation of SDNP School programme (www.sdnbd.org/school_programme/), the Telemedicine activities (www.sdnbd.org/telemedicine/, capacity development activities in terms of providing traditional and non-traditional training at school and college levels for extending knowledge networking at the grass roots (www.icmsbd.org), and a few other activities as relevant to the community development processes. In addition to these, a micro-credit component is in progress, which will only focus on providing financial support for continuing education (primary and secondary). Finally, efforts are there to establish a non-traditional ICT based University in the country, focusing the majority participants of the community. The next section will detail out a few activities of SDNP (and SchoolNet Foundation Bangladesh).

Main Thrust

Due to the complexity of societal problems, especially in a developing country, attentions were drawn not only for providing more specialized knowledge, which remains necessary as a source of inspiration for innovation, but also for methods to apply knowledge in the right way for solving real life problems. For solving problems that occurs locally, almost always an integration of different types of knowledge is demanded and that is something a higher education system organized to a large extent along traditional disciplinary lines are not effectively prepares for. Therefore, there is a need for both the 'traditional' way of knowledge development in which research is organized in a disciplinary way, and a new way of knowledge development within the context of appropriate applications. There comes the non-traditional learning processes, and collaborative learning could act as an important element of learning. These situations demand transdisciplinarity, heterogeneity, diversity in terms of their input from different stakeholders and a more direct influence on providing economic value to the society. This means that there is a need for whole out efforts for proper knowledge development processes in which a broad range of actors are involved, especially at the grass roots (Kuhlen, 2003; van Dam-Mieras, 2004).

Education is now recognized as the catalyst for achieving the primary goals of development: alleviation of poverty, reduction of inequity, improvement of health and nutrition, population control, social well being, environmental protection, nurturing democracy, and economic growth are among them (UNESCO, 2001). Computer

Supported Collaborative Learning (CSCL) can be a tiny solution to those communities, especially where highly educated teachers are not available and technically equipped classes are almost impossible (Bruns & Takahashi-Wetch, 2006; WSIS, 2005).

To uphold the goals of the Foundation (www.schoolnetbd.org) and assist in achieving the goals of the EFA[9], SchoolNet Foundation has been carrying out several activities, including delivery of donated computers to schools, training of teachers from the recipient schools, establishment of a central hub in the capital to mobilize the entire operation, establishment of regional hubs to manage its operation locally, support for open and distance learning, assist in providing telemedicine sessions in remote locations, and formation of local village groups for taking part in microcredit operation to enrich education base of local communities.

A few of the activities are given below:

School Programme

Till December 2006, SDNP has successfully distributed 150 computers to 68 schools (from the first consignment of 200 computers in 2002), and 28 computers to 10 schools (from the second consignment of 200 computers in 2003) and 246 Computers to 140 schools (from the third consignment of 400 computers in 2005). Under this program, 346 teachers from 228 schools have been given Computer Training in different batches. This initiative has provided basic hands on training on fundamental of computer applications to thousands of students in rural areas of Bangladesh. The schools were selected as per the selection criteria given by the WCE.

The partners of this component are:

WCE (World Computers Exchange): they provided the donated computers;

UNDP (United Nations Development Programme): they provided partial funding and necessary logistic support to bring the computers in Bangladesh as the Consignee;

USAID (United States Agency for International Development): they provided major funding for the programme to support the administrative costs at WCE;

FED (Foundation for Education and Development): they provided the role of the lead NGO, handled the currency transfer, support to other NGO partners of FED. With Google you find many foundation with education and development in the name, I have choosen here this one;

ISOC (Internet Society) Bangladesh Chapter: they provided support in selecting a few local schools;

ICMS (Institute of Computer Management and Science): they provided free training to the teachers of the selected school; and

SDNP (Sustainable Development Networking Programme of Bangladesh) they selected the schools as per the selection criteria, provided technical assistance, and distributed the donated computers to the selected schools.

Currently the foundation is running a survey to evaluate the status of those computers, their utilization in training, formation of lead schools in other parts of the country. One lead school is in operation at the North-West part of the country. Lead schools are acting as regional hubs and they can take care of small problems locally, so that it increases cost saving and reduces travel time of central hub personnel.

Capacity Development

Provision of providing training in basic computer operation and file management, including email, Internet, database and accounting is a regular programme of the foundation. Efforts are there to establish a HEI (higher education institute) and formation of a E-learning platform for its participants. This HEI will include formation of Wi-Fi mesh enclosing all local computer recipient

education institutes, so that they can be taken under a collaborative learning programme. Eventually, the foundation would like to carry out programmes to fulfill the six goals of EFA.

Telemedicine

A 15 months long "e-Health & Learning" (e-HL, www.ehl-bd.org) project was deployed in January 2003 by Sustainable Development Networking Programme (SDNP) Bangladesh which was funded by the European Commission under the Asia IT&C programme. The project built two network segments using point-to-point radio link with a bi-directional bandwidth of 2 Mbps. The first setup of the segment was in Dhaka and it connected the SDNP node at BIDS with the Comfort Nursing Home, covering an air distance of about 8 km. The second one was established from SDNP node in Mymensingh (120 km away from Dhaka) to a Community Based Medical College and Hospital (CBMCH), about 6 km away from Mymensingh node, creating a length of 134 km (including existing 120 km of SDNP backbone) of radio link with 4 hops in between.

During that phase eight seminars were delivered to doctors in Dhaka and Mymensingh in Bangladesh. Several workshops and seminars were also held locally and internationally. Real time video streaming was arranged during the workshops and later recorded over public network and LAN.

As a follow up of the telemedicine initiative in Bangladesh, SDNP Bangladesh has started telemedicine sessions from early August 2005. The project has arranged three seminars in August with Cox's Bazar regional node and Satkhira regional node using its own infrastructure and manpower. Among the three, two live sessions were held in between Cox's Bazar and Dhaka head office (August 05, 2005 & August 26, 2005), and one with Satkhira and Dhaka head office (August 19, 2005) to exchange medical information. Sessions included real patients at the remote and with one physician, and one medical expert was present at the head office to provide suggestions acting as third opinion. These sessions continued (every Friday) for each of the regions of SDNP Bangladesh (Cox's Bazar, Dinajpur, Mymensingh and Satkhira) till December 2006. Between August 2005 and August 2006, 439 patients were treated under this programme.

As a continuation of these efforts, SchoolNet is trying to utilize local cellular phones' EDGE enabled modems to reach out those remote areas and run two centers, one in Savar, Dhaka and one in Khajura, Jessore.

Microcredit

Forming a group of 200 families, in Savar and Khajura efforts are there to enclave them under a micro-credit programme through which individual families can obtain funding for continuation of education for their children. It is form of credit scheme to a group of families residing together. Though will be given to a single family, but responsibility goes to the group of families together. This is to ensure proper utilization of the loan amount and at the same time to improve the loan recovery process. Under this scheme, each of the family will be given a funding of an agreeable amount for promoting knowledge building activities, like providing education support, establishing a small enterprise in the locality, enter into a skills development institute to be hired by the local industries, or establishing cooperative among themselves. Furthermore, through this scheme other localized activities will be supported, as such introduction of solar power (for cooking, water logging, lamps, running smaller machineries, including personal computer/laptop), and establishment of wind mills or step pumps (for water logging, generating electricity).

RECOMMENDATIONS AND CONCLUSIONS

The understanding of knowledge development (towards knowledge communications) is always critical, as appropriate knowledge and information do not simply exist. They have to be acquired, nurtured and transformed. Similarly, the element of the society for whom the knowledge development processes are to be devised, their active participation within the processes has also to be ensured. Knowledge and information in all areas are not the same, they are localized and thereby, knowledge development processes should incorporate localized and indigenous inputs. Furthermore, adequate safeguard should be taken for their dissemination, so that they are uniformly and used collaboratively (Kuhlen, 2003).

Education and learning is important to strengthen the country's information economy. It is essential that the government and private sector ensure appropriate skills are taught through tertiary education and on-the-job training to meet local industry needs. The demand for personnel with IT knowledge (perhaps ICT knowledge), experience and qualifications from the workplace is growing fast, as the workplace is gradually applying computing skills to improve their efficiency in this competitive world (Kelegai & Middleton, 2002). Learning should not be restricted to individuals and specific perimeters; rather it should take the form of group learning or collaborative learning and should not remain under any comprehensive boundaries.

Furthermore, as the information society is transforming into knowledge societies, the very concept of "knowledge" has to be revisited. Knowledge should go beyond the peripheries and become a collective process involving the entire scope of the society. A collaborative learning network should incorporate promotion of distributed intelligence, ubiquitous networks, information sharing, information literacy, open access, public goods in public domain, multilingualism, and localized content. SchoolNet Foundation in Bangladesh is working in these aspects to endorse knowledge building activities at the outer peripheries of the country, so that the output can generate appropriate benefit to the grass roots and at the same time can sustain. Now that the foundation has a set manpower and thorough experience on this scheme, the future aim is to build a collaborative learning network with 1000 schools through distribution of 5000 computers and establish a dual-mode ICT based university by 2012.

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ENDNOTES

1. Bangladesh Bureau of Statistics data, 2004
2. The Bangladesh Rural Advancement Committee (BRAC) is today one of the largest NGOs working in primary education.
3. Non-Formal Primary Education Programme (NFPE)
4. The Female Secondary School Assistance Project, Female Secondary Education Stipend Project, Higher Secondary Female Stipend Project
5. http://www.internetworldstats.com/asia/bd.htm
6. International Telecommunication Union
7. UNESCO
8. UNDP
9. Education For All of UNESCO

Chapter 9
MIPO Model:
A Framework to Help the Integration of Web Technologies at the Higher Education

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ABSTRACT

The purpose of this chapter is to describe the development of a practical model that emerged from the inquiry made. The initial model has been created based on experiences and literature review. After that, it was tested on the information and technology system units at higher school and adapted as a result of four cycles of an action-research work combined with a case study research. This process resulted in a new framework that helps the integration of web technologies, at the higher education, in order to enhance learning, especially for the information and technology area. The MIPO model described in this chapter presents a b-learning instructional design that relates practical information applicable to a number of situations. It combines ideas from different authors and incorporates behavioral, cognitivist, constructivist and socio-constructivist approaches, in order to obtain the benefits of each one. This model is based on what we know about learning theories, information technology and blended-learning. The information, concepts and procedures presented here give support to teachers and instructors, instructional designers and planning teams – anyone who wants to develop effective b-learning instructions.

INTRODUCTION

In the higher education context, besides everything that has been said about the use of e-learning technologies, we attested the idea defended by the European committee (European ODL Liaison Committee, 2004): Our higher institutions continue to use the traditional education schema promoting an environment based on providing information. This scenario constitutes the best option for many

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students, teachers and institutions. When an institution adopts an LMS (Learning Management System), it does not ensure the integration of Web technologies on the educational process.

However, during this study we had the opportunity to deal with many different experiences on the e-learning domain. Many times the changes occur on the technologies and without any methodological or pedagogical support. For instance, whenever printed documents are replaced by digital contents, using the same communication schema (emitter-receiver) but with more sophisticated tools.

Updated technologies give support to the construction of such a huge set of learning strategies and methods' options that can be as large as our imagination. All technologies should be viewed as work tools and not as an end itself. More important than choosing a tool is the selection of the learning strategy, in order to achieve the defined goals.

We believe that the existence of a model that supports the complex management process of blended-learning (b-learning) may promote the systematization, the usefulness and the organization of the web classroom integration. The MIPO model intends to be a dynamic and flexible structure that offers a large set of orientations in order to conduct a combined learning process.

Unlike the majority of e-learning models proposed (Laurillard, 2006) (Schofield et al., 2006) (Klein et al., 2003) that describe general procedures, the MIPO model gives a special emphasize to the activities design strategies and is targeted to the blended-learning systems, at the higher education.

BACKGROUND

E-Learning Systems

The online environment where we can create, storage and manage the teaching-learning process is named Learning Management System (LMS). A LMS is a web application in which we can manage teaching process in the perspective of administration/management, pedagogical/Education and technical, using basic communication tools such as: e-mail, forums, chats, and so on, which support the interaction among participants (Pimenta & Baptista, 2004) (Koponen, 2006). For example Luvit, Moodle, WebCt, etc.

Technical System

Technical system is the Virtual Learning Environment (VLE) embedded in a LMS. According to the Britain prototype (Britain & Liber, 1999) we may define two groups of features: The resources and the communication tools.

In the resources area, we may find features such as: The course outline (an overview of the course structure), the model of navigation (allows users to move around the environment), Notice-board (announcements area that may appear as soon as a student logs into the system), a class list and students' homepages (to know the other students or for tutors to get some ideas about students' background), calendar (a calendar tool), search tools (to help when a course structure becomes very large), Metadata (a simple information about an object. It is important to categorize and search objects), Bookmarking (may decrease the amount of time spent when navigating in places frequently used), Multimedia resources (multimedia resources can be accessed and stored within the learning environment) and file upload area (students should be able to upload their own materials) (Britain & Liber, 1999).

In the communication tools area we may find two kinds of communication tools: asynchronous and synchronous. Asynchronous tools enable communication and collaboration over a period of time through "different time and different place" mode. People can interact according to their own schedule. As examples we can outline the e-mail (that can be used to email either the

tutor or individual students on the course), the conferencing tools (such as forums, blogs and wikis provide the means for students to engage in collaborative exchange about topics on the course) and assignments (provide a means for students to return completed assignments to the tutor for grading and feedback) (Britain & Liber, 1999). The synchronous tools enable real-time communication and collaboration in a "same time, different place" mode. People can interact at the same point in time. The relative importance of such tools in a system depends largely on the intended use of the system. As examples we can outline the instant messaging, audio-conferences, web-conferences, application sharing, and so on (Britain & Liber, 1999).

The interaction among people without any face-to-face contact allows new kind of socialization (Santos, 2003). The way as the communication systems come into the screen influences the dialogue and the level of interaction (Vick et al., 2006) but is neither the interface, nor the contents that will determine the level of interaction, but the dynamic of collaboration promoted (Santos, 2003).

Synchronous text communication promotes a social environment and the relationships among participants. Rodrigues (Rodrigues, 2004) outlines some of the main advantages:

- Allows communications and immediate feedback among participants;
- Allows direct communication among students;
- Promotes the spontaneous dialogue;
- May reproduce the class environment.

The same author also outlines some disadvantages of using a synchronous communication:

- Punishes who does not have a good written expression and more difficulties using keyboard;
- Demands online presence according to a calendar;
- Communication may become chaotic, especially if it involves a large number of students.

Communication must be seen as a complement of asynchronous communication due to the limit of its pedagogical application. In order to be effective it must be used under a certain set of conditions, namely the reduced number of participants, a good time management and the identification of participations' roles. This kind of communication is useful to the construction of social relationships but is not satisfactory to the pedagogical process. We may have more adhesion by those who are more acquainted with these technologies. Besides that, on one hand we may get good contributions but on the other hand, they may arrive out of time (Morgado, 2005).

Management System

Learning management system includes the administration support of the course, management of tutors and learners and management knowledge systems (Koponen, 2006). Pimenta and Baptista (Pimenta & Baptista, 2004) outline the following management system features:

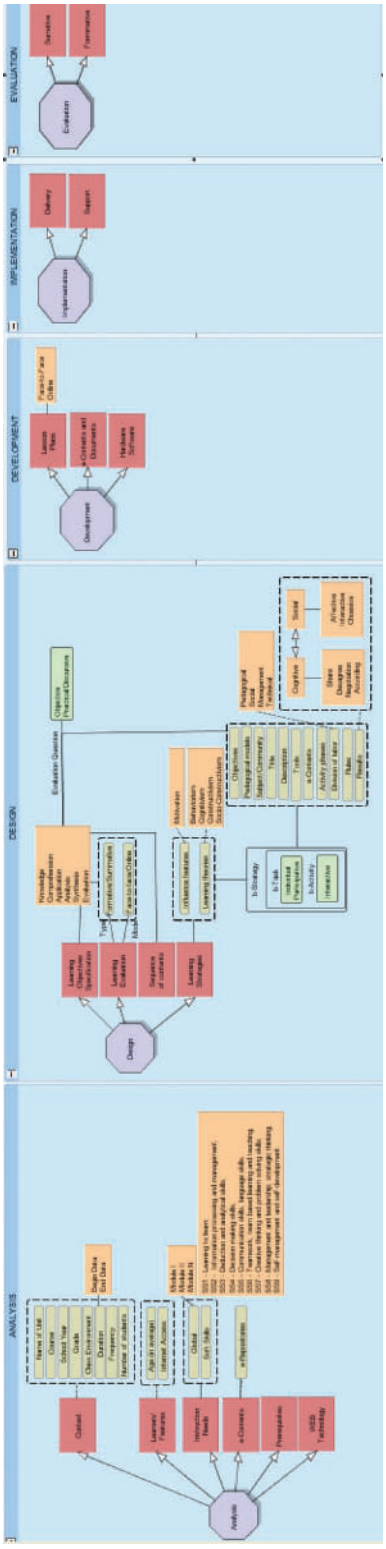
- Students management;
- Contents management;
- Profile and views management;
- Activities control.

Education System

Education system includes models and methodologies based on learning theories that support individual styles and contexts (Koponen, 2006).

The use of e-learning environment is only limited by creativity (Souza, 2005). The use of online environment merely to make contents available, even if they are well constructed, in a long-term, may become uninteresting and based only in

Figure 1. Global vision of MIPO model



theory. We could not state that e-learning has more or less quality than traditional learning, e-learning quality depends on instruction design and students engagement (Duffy & Kirkley, 2004).

E-Learning Development Models

A course development model, also named instruction model, intends to be a guide in order to manage, plan, develop and implement a learning process (Kemp & Toperoff, 1998).

Based on the ADDIE model (Analysis, Design, Development, Implementation, Evaluation) (McGriff, 2000) and on the activity theory (Engestrom, 2001), we created an initial b-learning instruction model that was tested on the information and technology system units at higher education. This model was adjusted as a result of four cycles of an action-research work combined with a case study research.

MIPO Model

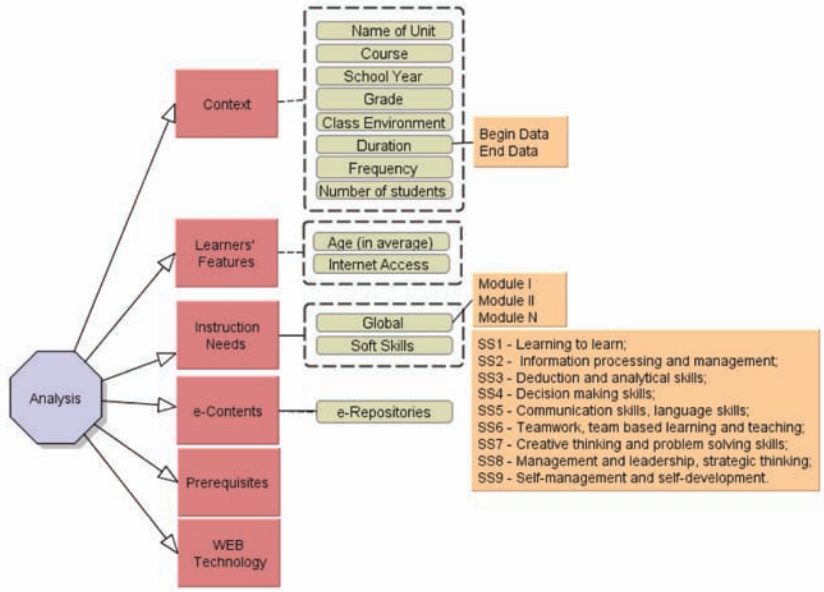
The MIPO model (integration model by objectives) proposes an integration of web technologies by learning objectives. This model joins and relates the elements that emerged from the review of literature made in a systemic view and was validated in context as well as in a practical research.

According to this MIPO model we should follow, interactively and dynamically the following phases: learning environment analysis, instruction design, instruction development, unit implementation and model evaluation:

Phase I – Learning Environment Analysis

According to the MIPO model, the first phase of the integration process is the analysis of the system. Teacher acts as an architect, who before starting a project, analyses contextual requirements. Later, the results are reflected on the space organization,

Figure 2. Analysis phase of MIPO model



that is, on the instruction design.

At this stage we analyze elements such as the identification of context, learners' features, instruction needs, available contents, prerequisites and tools:

The analysis phase of MIPO model results in a document with the following elements:

Context

The context describes the environment where learning will take place, namely by identifying the unit, the course, the school year, the grade, the class environment, the duration with begin and end date, frequency and number of students enrolled.

This process helps the environment course recognition, to be considered later on the instruction design. The act of understanding an idea or concept does not occur in an isolated way from the university life, it takes place on the course context, department and institution.

Learners' Features

The identification of age (in average) helps to obtain important indicators about students' motivation and personal objectives. The identification

Table 1. Learning environment analysis document

Phase I – Learning Environment Analysis
Context Name of unit: Course: School year: Grade: Class environment: Duration: Begin/end date: Frequency: Number of students: *Learners' features* Access to the technology: Age (in average): *Instruction needs* Global objectives: Units: Soft Skills: *Available contents (e-repositories):* *Prerequisites:* web *technology:*

of students' previous experiences and abilities to work on certain environments as defended by Kemp (Kemp et al., 1998) may be obtained on the face-to-face classes.

The easy access by students to the Internet is crucial to the learning success on a blended-learning environment. If it does not happen, the process of web integration is at risk. Hence, it is useful to make an online inquiry at the beginning of the course to determine the kind of access students have.

Instruction Needs

The objectives specification, global to the unit and transversal to the course, should guide the learning paths definition and lead the creation of contents modules.

Global objectives are detailed afterwards, at the design phase, in order to develop targeted learning actions. At this stage, the definition of contents modules according to the global objectives, scaffolds the whole learning process.

The clear and complete explanation of transversal objectives (also named soft skills) leads to the commitment and guides posterior learning strategy definition. The European Union (EU, 2006) outlines the nine main abilities required by European enterprises:

SS1 - Learning to learn;
SS2 - Information processing and management;
SS3 - Deduction and analytical skills;
SS4 - Decision making skills;
SS5 - Communication skills, language skills;
SS6 - Teamwork, team based learning and teaching;
SS7 - Creative thinking and problem solving skills;
SS8 - Management and leadership, strategic thinking;
SS9 - Self-management and self-development.

This classification is an important scaffold to support the definition of transversal objectives and to guide both teacher and students.

Available E-Contents Identification (E-Repositories)

The e-contents analysis is the identification of available resources that may support the teaching-learning process. These resources should be modular in order to facilitate its reuse in different contexts. A course may use a large number of learning objects. These objects may be used as a simple resource or combined to be used in a bigger instruction. The applets, animation, video clips, static images, electronic documents, web pages or web sites are examples of learning objects (Campbell, 2004). The use of an e-repository of learning objects may facilitate the process of contents selection.

The identification of available contents demands time to search and select but avoids the development of new materials.

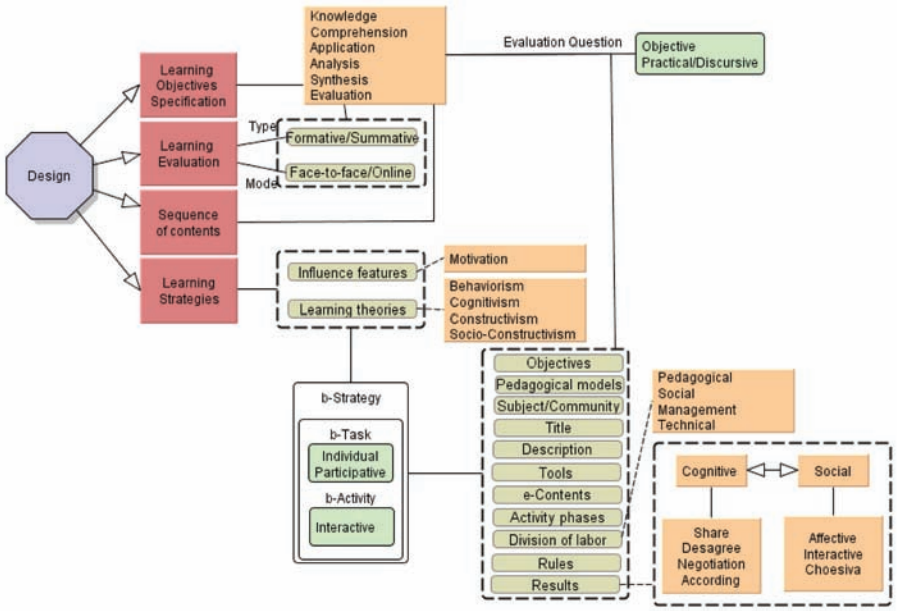
Prerequisites

The process of prerequisites identification establishes a platform, in order to ensure the same level of previous knowledge among all participants (Allen, 2007). It is crucial to clarify and spread the unit prerequisites. We may use the self-learning and constant support in order to help students that do not satisfy the prerequisites. Students should be hold responsible for the importance of long life learning. The lack of prerequisites might give rise to doubts on the learning strategies success.

Web Technology

The students' acquaintance with technology tools in use is very important. We may make a general demonstration and/or give tutorials/ manual. However, before each activity, it should

Figure 3. The design phase of MIPO model



be demonstrated to students how they can interact with tools, trying to review concepts and clarify doubts. In general, students are motivated and learn in a fast way how to use tools. Beyond this, the intuition of the majority of learning tools results many times on self-regulation on the use.

The later instruction design influences the selection of tools to use, among the ones identified as available. On the contrary, the idea defended by (Allen, 2007) states that the identification about available tools, such as LMS, will influence the posterior instruction design.

Phase II - Instruction Design

The system analysis supports the instruction design which, according to the MIPO model, includes the specification of objectives, the evaluation methodologies, the definition of contents sequences and learning strategies. At this stage, it is important to ensure the coherence of learning objectives with each content module and the evaluation mode:

As a result of this instruction design phase, we obtain the following documents:

Phase II (1) – Objectives, evaluation and sequence of contents;
Phase II (2) – b-Strategies of learning.

The first document has the following structure:

Specification of Learning Objectives

The learning objectives specification process conducts the development of an important guide to be used both by teacher and students.

The use of a taxonomy may facilitate the process. Bloom (Bloom et al., 1975) suggests a taxonomy of learning objectives sorted out in six levels: Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation. The intention is to display the behaviors starting from the simplest to the more complex one.

Although the Bloom taxonomy of cognitive

Table 2. Instruction Design Document (1)

Phase II (1) – Instruction design (objectives, evaluation and sequence of contents)			
Learning objectives specification:			
Objectives (Bloom taxonomy)	**Module I**	**Module II**	**Module II**
Knowledge	OC 1 (1.1) – Description OC 1 (1.2) – Description		
Comprehension	OC 2 (1.1) – Description		
Application		OC 3 (2.1) – Description	
Analysis		OC 4 (2.2) – Description	
Synthesis		OC 5 (2.3) – Description	OC 5 (3.1) – Description
Evaluation		OC 6 (2.4) – Description	
Learning evaluation Type: Formative: Summative:			
Mode Face-to-face: Online with supervision: Online without supervision:			
Objectives		**Evaluation Question**	
OC1 (1.1), OC1 (1.2), OC3 (2.1), OC6 (2.4), OC5 (3.1)		Objective	
OC2 (1.3), OC4 (2.2), OC5 (2.3), OC6 (2.4)		Practical/discursive	
Sequence of contents:			
Objectives		**Sequence of contents**	
OC1 (1.1), OC1 (1.2), OC2 (1.3)		P1.1 Description P1.2 Description	
OC3 (2.1), OC4 (2.2), OC5 (2.3), OC6 (2.4)		P2.1 Description P2.1 Description P2.1 Description	
OC5 (3.1)		P3.1 Description P3.1.1 Description P3.1.1.1 Description	

knowledge has been the most well-known, there are many others that we can consider. Rajadell and Serrat (Rajadell & Serrat, 2000) and Barreira and Moreira (Barreira & Moreira, 2004) outline some of them, such as the taxonomy of Guildford, Ebel, Herber, Orlish, and so on.

The specification of learning objectives by modules will structure the next step of instruction design.

It is important to establish a balance between the level of demand and the time available for the study of the unit. The highest level of knowledge demands more time and teacher support.

Learning Evaluation Process

According to MIPO model, after defining the objectives, we should design the evaluation process. Taking decisions about what to evaluate is useful to understand clearly the learning objectives. The design of the evaluation process has the objective of making the way how students will demonstrate their knowledge clear. The definition of the nature of the evaluation questions,

the criteria and the standards of evaluation must be based on learning objectives and showed to students. These procedures construct scaffoldings in order to make students able to evaluate their own assignments.

The main question is "how will students demonstrate if they achieved the objectives of the unit?" The evaluation questions may test the student ability on future real context. For instance, students may be asked to choose justification, on a described work context. In this way, we evaluate the higher level of competences differently from those that ask only to compare or simply to define terms.

Evaluation can be classified in two main groups: formative and summative. In the summative way the evaluation occurs at the end of the instruction. In the formative way the evaluation occurs during the instruction process and it consists in a continuous collection of learning thoughts (Born, 2003).

The contextual importance of formative and summative evaluation conducts the decision on the use of the evaluation modes such as: face-to-face, online with or without supervision.

The nature of the questions to ask and the standards to the success should be based on learning objectives and spread around the entire class. These procedures scaffold the students' understanding. The specification of evaluation modes to each learning objective may facilitate the alignment and leads the later activity design:

The objective questions are useful to evaluate the knowledge in different levels of complexity and to facilitate the correction. The questions may be the following:

- True/false questions;
- Gap filling;
- Matching questions;
- Sorter;
- Delete items;
- Multiple choice.

These questions have the disadvantage of not allowing students to develop their own answers.

The practical question intends to evaluate the students' ability to manipulate a tool. This kind of questions is useful to evaluate knowledge on the application level.

The discursive question intends to evaluate the ability to observe an event and to organize ideas, and even the capacity to write down thoughts. This kind of questions is useful to evaluate more complex learning results.

Sequence of Contents

According to the MIPO model, after defining objectives and designing learning objectives, we should establish the sequence of contents.

This organization avoids the specification of learning objectives based on the contents. This scenario usually results in sentences such as "understand the content A" and in a lowest level of knowledge (first or second Bloom level). Despite the importance of these levels, if the learning objectives consist in achieving a higher critical

Figure 4. Specification of evaluation modes to each learning objective

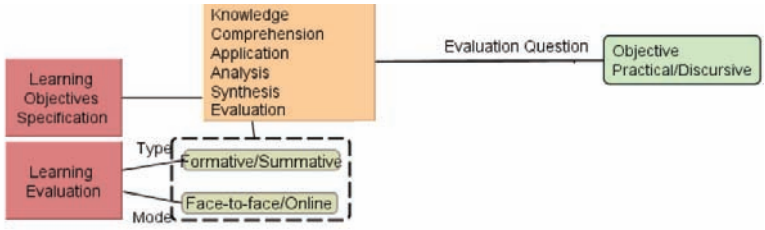
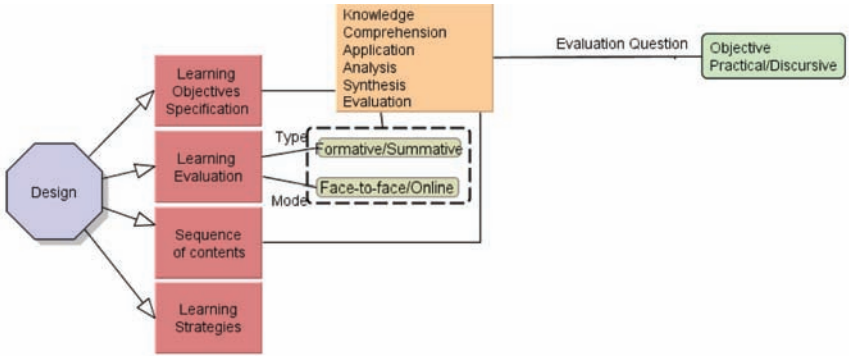


Figure 5. Alignment between objectives and contents



thinking level, it is important to explicit it on the objectives definition associated with analysis, synthesis and evaluation.

This clarification may guide the learning-teaching and evaluation process and simultaneously facilitate the process of selection and justification of learning strategies:

The construction of a linking table may help this process.

Learning Strategies

In the MIPO model, the last step of the design phase consists in the description of the instruction strategies, illustrated on the learning activities and influenced by external factors as well as aligned with pedagogical models.

A combined instruction strategy design (blended-strategy or simply b-strategy) demands the biggest effort of all. In the MIPO model, the design of a b-strategy includes a set of learning individual tasks (for instance an online test) or participative tasks (for instance the building of a repository of assignments) and interactive activities (for instance an interactive game of learning). These tasks and activities are more or less complex and intend to promote the learning in a semi-online environment (b-task or b-activities):

A good b-strategy helps to reach the learning objectives (global and soft skills) taking into account the influence factors and the pedagogical models.

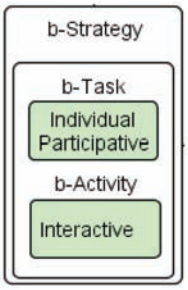
Influence Features

A b-strategy design should consider the results of the context analysis done in the previous phase. Time available, students' age, class dimension, the course, the grade, etc. are elements that need to be considered.

Motivation comes up as a crucial element that influences the way people participate on learning activities and develops self-regulation, time and task management.

To give positive feedbacks, to promote activities with a balanced complexity, to help students finding the importance on the study matter, to create an open and positive atmosphere and to help students feeling that they are important on

Figure 6. Designing a b-Strategy



the learning community, are some of the major features that may be used in order to increase students motivation.

Many authors defend that we should provide students cooperation, use active learning and contextualized activities, not refusing them, we should consider the learning objectives.

This process may become more sustainable if we add other features such as: contact with students frequently, give correct time to achieve objectives, communicate to students the great expectations and respect differences.

Students' motivation and general principles for the learning success are, according to the MIPO model, important features to consider on the design strategy phase. Nevertheless, learning something new or developing a deep study on a subject is not a linear process. The way as we learn, individual learning styles (Kolb, 1984) (Felder & Brent, 2006) and multiple intelligences (Gardner, 2000) characterize the singularity of the learning process. In this sense, we should consider these features when we are designing instructions.

Features as culture, motivation, emotional feelings, previous experiences and personality are also important. Whenever possible, teachers should give value to diversity responding to students preferences, but never forgetting the learning objectives. We should also consider pedagogical models in order to scaffold interactions (McGriff, 2000)(Kemp et al., 1998).

Summarizing, we identified the following main learning influence features:

- Contextual analysis results;
- Time definition;
- b-Strategy complexity;
- Nature of subject in study;
- Personality, ways and individual learning styles;
- Previous experiences, knowledge and culture.

Learning Theories

The learning strategies designed may be based on influence features, learning styles, multiple intelligences but also learning theories. Today's theoretical design approaches can be seen a derivation of behaviorism, cognitivism and constructivism viewpoints (Allen, 2007).

Students' participation in small online tasks (b-tasks), either individual or participative helps the construction of knowledge scaffold. This fact allows a better participation on b-activities with more complex demands.

The choice of the pedagogical model should consider the moment of learning. At the beginning of the subject study, it is important to make sure that students are getting the basic knowledge. Then, it is important to consolidate it and promote the self-learning based on previous experiences. At the end, it is important to promote a deep learning by social interaction. This path should be aligned with learning objectives. In this context, learning may be achieved by defining behaviorist b-tasks, based on the repetition, mainly to assimilate concepts. These tasks correspond to the implementation of individual objective questions. In order to go from a short term memory to a long term memory, the knowledge understanding may be promoted by using individual or participative questions and by implementing practical or discursive b-tasks.

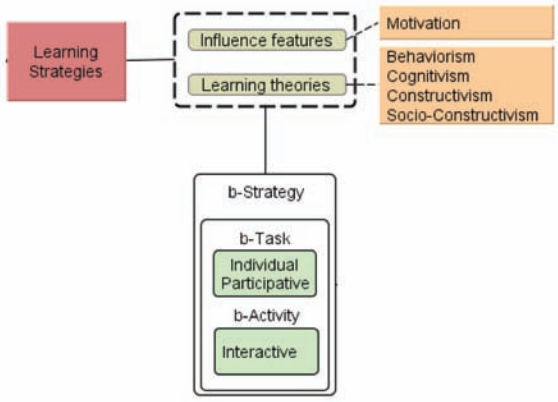
The use of synchronous and asynchronous communications available on the internet and identified on the previous analysis phase helps the implementation of interactive b-activities supported on the socio-constructivist approach.

The choice of a pedagogical model does not have to be exclusive. On the contrary, it may be combined in different moments of the learning process.

Based on influence features and pedagogical models selected, the instruction design also includes the definition of activities in order to reach learning objectives.

In the instruction design, it is important to make

Figure 7. Influence features to be considered on instruction design



sure that we are promoting different activities that cover all objectives defined and that we are in fact helping students to prepare themselves to answer the evaluation questions (objective or practical/ discursive nature).

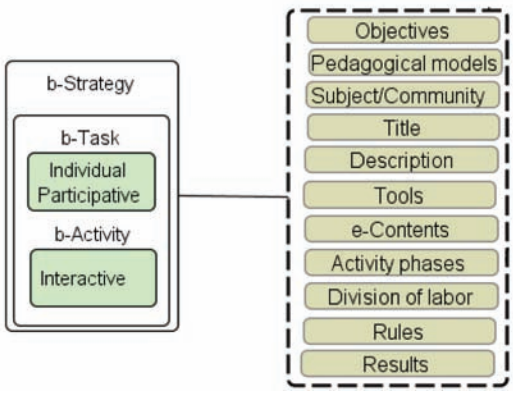
The building of a database with different b-tasks/b-activities in order to achieve different objectives will sustain the reuse in later editions.

B-tasks should be aligned with course objectives in order to facilitate the organization and procedures and ensure that all the contents of the program are covered.

A b-activity differs from a b-task mainly due to the collaborative nature applying the socio-constructivist approach. Usually a b-activity demands more time to design and to develop and also demands the definition of participants' roles. The b-activity phase definition helps to sort out the individual work. The design of a b-task or a b-activity includes the following structure:

The design of a b-task or b-activity results on a document with the following structure:

Figure 8. Elements of a b-task or a b-activity design



Objectives (Specific and Soft Skills) and Pedagogical Models

The construction of knowledge should be based on the matter on study and on the learning outcomes. The b-strategy should be aligned with learning objectives.

The importance of aligning both the learning objectives and soft skills and the b-activities is crucial and if we add the learning theories elements, we may get a good coherence among all main elements that influence the b-strategy design and adaptation for further use.

Subjects/ Community

Subject are individuals or a group of individuals who participate in an activity. Community is a group of people who interacts with the environment to reach objectives.

The identification of the subject and com-

Table 3. b-Strategy Document

Phase II (2) – Instruction design (b-Strategy)		
Objectives Cognitive: Soft Skills:		
Pedagogical models:		
Subject/Community:		
b-Strategy title:		
General description (nature and type):		
Tools:		
e-contents:		
Activity phases:		
Division of labor:		
b-Strategy title		
Phase	*Begin date*	*End Date*
F1 – Description	dd-mm-yy	dd-mm-yy
F2 – Description	dd-mm-yy	dd-mm-yy
F3 – …		
FN – Description		
Rules:		
Results:		

munity helps the delimitation of the system frontiers.

Title and General Description

The title and general description definition offers the identity to the activity and clarifies directions.

Tools

The tools element may be a forum or a chat in a LMS, identified in the previous analysis phase, used to support the b-task or b-activity. Regarding the tools element, it is important to consider the constant changing on interactions and contents formats. The tools chosen should be faced as a resource to achieve the learning objectives.

e-Contents

The choice of the e-contents should be done according to the b-task and b-activity nature and the subject in study. The selection of e-contents in different formats (text, audio, video, etc.) helps to cover the learning styles.

Activity Phases

The activity division in phases with an appropriate time definition guides the processes. The time definition is very important. It should be neither quick as to avoid all participations, nor too long as to cause less motivation.

Division of Labor

Division is the distribution of subjects' roles, powers and responsibilities. The roles of participants

depend on the nature of the work in progress.

Based on the four dimensions of tutor roles proposed by Berge and Collins (Berge & Collins, 2000) (pedagogical, social, management and technical) it is possible to outline the following main tutor tasks:

Pedagogical: Teacher should use many pedagogical methods in order to keep the discussion on topic and act as a facilitator and guider of learning. He should also design the e-learning group activities.

In the traditional education, most of the times the author and the designer of instruction are the same person but on e-learning environment we must establish the difference.

We may outline the main tutor pedagogical tasks:

- Discuss tutor expectations, students responsibilities and participation rules at the beginning of the b-task or b-activity;
- Keep the b-task or b-activity on topic;
- Follow the process making revisions and consult the activities, giving constructive feedbacks;
- Help students preparing their participations on b-tasks or b-activities;
- Present the b-tasks or b-activities conclusions.

Social: It is important to create a user-friendly environment in order to promote learning throughout a good group feeling. On an online workgroup activity, the tutor must moderate the discussion.

We may outline the main tutor social tasks:

- Convey a positive feeling and pass on a useful message;
- Construct a good environment among students;
- Correct the wrong answers with consideration enhancing the positive aspects;
- Motivate students to engage in a learning b-strategy.

Management: Moderator establishes the schedule and the activity pace acting as a manager that organizes procedures, administrates and manages messages exchanging. Tutor should maintain the learning pace in order to get a significant interaction in an asynchronous environment. In order to engage students in the learning construction, participants need to work together and manage time efficiently.

We may outline the main tutor management tasks:

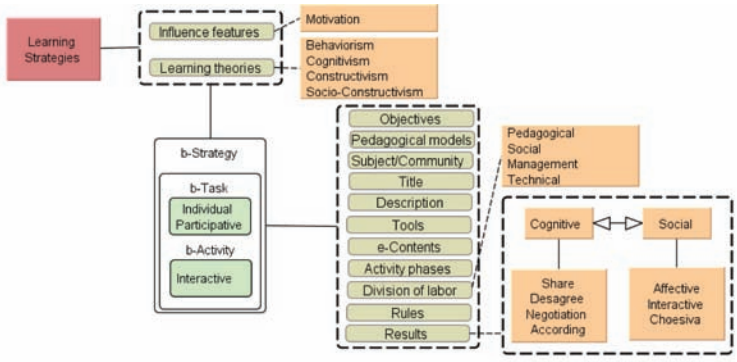
- Define and schedule the b-tasks and b-activities;
- Accomplish the process in order to solve eventual problems;
- Monitor the answer time;
- Plan carefully. Consider the synchronous and asynchronous communication strategies;
- Create a web environment to support the b-strategy procedures;
- Keep the development of b-strategy according to rules defined;
- Help students to manage group tasks.

Technical: Tutor should be acquainted with technology in use and promote a good use by students. If either the tutor or the students are not acquainted with technical mechanisms, they will need more time to solve technical problems, forcing themselves to do it out of the discussion time. In this way, it is important that all participants have technical orientations.

Rules

Rules are conventions, social relationships or schedules that govern community members' behavior.

Figure 9. Results of a b-strategy



Results

The "result" element represents the final product, for instance, if student learns or not.

In order to measure the results, we may analyze the posts in order to determine the quality of interactions.

The interaction forums analysis depends on the nature of the activity and may be enhanced mainly by social or cognitive dimension.

Development

The development stage is based on the previous phases of analysis and design. The purpose of this phase is to generate the lesson plans and lesson materials. During this phase you will develop instruction lessons and all media and support documentation that will be used. This may include hardware and software. Materials and procedures development must be based on the instruction strategy.

For each lecture, it is important to develop or adapt material, develop presentations, organize lessons, seek for cooperation and represent it on e-learning platform.

The following tasks should be performed on the development phase:

In the development phase the design of the lesson plan is important. It includes the identification of online and offline activities and also the alignment between objectives and program.

As a result of MIPO development model we should get a document with the following structure:

Figure 10. Development tasks

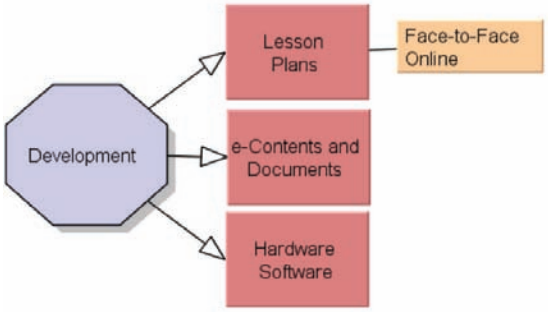


Table 4. Instruction development document

Phase III – Instruction Development			
Lesson Plan			
Objectives	**Sequence of contents**	**Face-to-Face**	**Online**
OC1 (1.1), OC1 (1.2)	P1.1, P1.2	face-to-face activities	Online activities
OC1 (2.1), OC2 (2.2)	P1.1, P1.2	face-to-face activities	Online activities
e-Contents:			
Hardware and Software:			

Figure 11. Implementation tasks

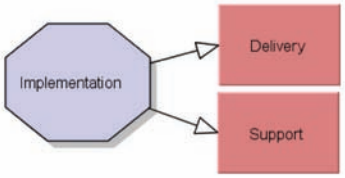
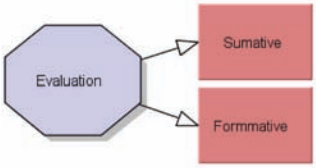


Figure 12. Evaluation tasks



Implementation

The implementation phase refers to the delivery of the course. The purpose of this phase is to promote an effective and efficient delivery of instruction. This phase must encourage learner's understanding of contents. It is important to provide a good support in order to achieve the objectives defined.

The following tasks should be performed on the implementation phase:

Face-to-face sessions are useful to the presentation, accomplishment and clarification of doubts about the activity.

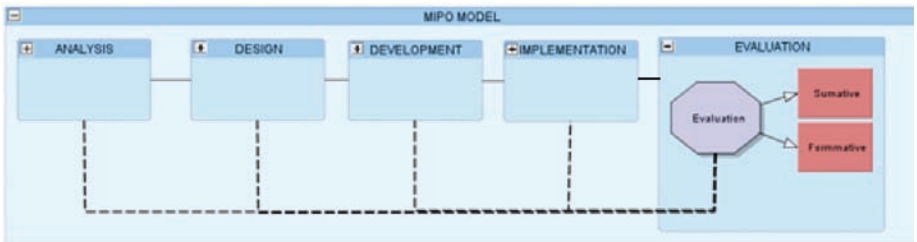
Evaluation

The evaluation phase measures the effectiveness and efficiency of instruction. Evaluation should occur throughout the entire design process, within the phases, between the phases and after implementation:

On the formative evaluation we should answer questions such as "do the b-tasks and b-activities cover all learning objectives?"; "are there activities that are not covering any objectives?"; "do students have all the information necessary?" etc.

The summative evaluation is made at the end of the process and the results should be used on further course editions

Figure 13. MIPO model - evaluation



FUTURE TRENDS

The model described was tested in computer science education units in the Portuguese higher education context. Henceforth, we will apply this conceptual model to other areas in order to validate it.

CONCLUSION

In this chapter, we demonstrate our point of view on how to construct a well-designed b-learning environment. This model collects research results, experiences and multiple theories.

Present technologies may support a huge set of strategies and method options as large as our imagination and should be viewed as work tools and not as an end itself.

It is far more important to choose the right strategy in order to achieve the goals defined, than a mere tool selection.

We believe that the existence of a model that may support the complex management process of b-learning may also promote the systematization, the usefulness and the organization. The MIPO model showed is a dynamic and flexible structure that offers a large set of orientations in order to conduct a combined learning process.

This model supports the performance of European directions (Parlamento Europeu, 2002), in order to use the tic as a tool of learning mediation. It offers as well a guide in order to help the use of a huge amount of information available on internet by practical examples.

Unlike present education guidelines, this model indicates how to get it. This model results from the evaluation and analysis of various pedagogical approaches and helps the instruction design beyond the traditional classroom environment. The correct use of technologies on higher education demands individual and collective behavior changes. The implementation success always depends on the teacher's will.

The theory associated with MIPO model was generated by inductive methods in which generalizations were extracted from specific observations. This model may be tested by other researches who by a deductive method may foresee new data.

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Chapter 10
Today's Technologies:
Faculty Adoption Factors and Effects on Higher Education

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ABSTRACT

This chapter provides commentary on the broad-based effects that current instructional technologies have had on higher education instruction. Adoption and utilization of instructional technologies have done more than simply supplement teaching and learning; they have altered the environment in multiple ways. The unintended consequences of these technologies have changed and may continue to change the interaction among faculty, students, and learning materials. Some of the factors that have contributed to certain technologies becoming popular in today's higher education teaching environment will also be discussed. Awareness of these factors and unintended consequences will help practitioners plan for the emergence of newer technologies and better understand their potential impacts on higher education.

INTRODUCTION

Properly forecasting and preparing for future innovations in educational technology requires an examination of the successes and failures of past innovations. These successes and failures can provide a glimpse into what is necessary for an instructional or media technology to effect positive educational change, as well as attune us to some of the unintended consequences that can occur. As professional educators, one of our callings is to learn from past mistakes and successes.

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Over the past couple of decades, several different forms of technology have been incorporated into higher education instructional settings with the intent to improve teaching and/or learning (Bates & Poole, 2003). Although studies show non-significant differences with traditional forms of instruction in terms of learning gains (Russell, 1999), each of these technologies has provided some form of change on how education is delivered and experienced. An analysis of those technologies' adoption into the classroom may provide insight into the next wave of eLearning technologies.

This chapter will provide critical commentary on the impact and status of instructional and me-

dia technologies within higher education today. Particular focus will be placed on how certain technologies have contributed (and/or failed to contribute) to the advancement of education. Furthermore, the unintended consequences of these technologies will be discussed which provides further insight into the overall impact. The focus will be on technologies that are available to most faculty and not those that are unique to a small niche. Some examples of the technologies to be discussed are PowerPoint™, learning management systems, and audience response systems. In order to understand the promise and peril of tomorrow's technologies, this chapter will address the various issues concerning the technologies such as costs, instructional strategies, and logistical issues to both instructors and learners. The final part of the chapter will briefly discuss current technologies that could soon find their way into mainstream higher education.

BACKGROUND

Any broad-based discussion on instructional technology within higher education should state in advance the assumptions made during the discussion. This section contains a clarification of perspective and terms to ensure that assumptions behind the commentary are implicit.

The terms instructional technology and educational technology have been defined and interpreted in a variety of ways. Pedagogical researchers, media specialists, instructional designers, teachers, computer science experts and others contribute to the field and each tends to define the terms differently. The definitions have encompassed such concepts as the methodologies, techniques, and processes used in instruction, as well as the different forms of media and other technologies used in instruction (Gentry, 1995). Although instructional (or educational) technology definitions usually include more than media (Seels & Richey, 1994), most practitioners associate it only with computer and digitally-based tools and applications (Reiser, 2001). While recognizing that many in the instructional design and technology research field uses a broader definition, the term instructional technology in this chapter will refer only to the computer-based tools used for instructional purposes.

Variances among higher education institutions also make broad-based discussions of instructional technology difficult. Universities and colleges differ in terms of size, scope, and mission, as well as technology utilization, infrastructure, support, and spending. Because of these differences, the circumstances and implications for change are unique among institutions. With the understanding that generalizations do not apply in all cases, this chapter attempts to provide general commentary that is more or less true across institutions. Recognize that there will be exceptions at the institution, department, and/or individual faculty member level for each commentary provided.

ANALYSIS OF THREE CURRENT INSTRUCTIONAL TECHNOLOGIES

The following sections discuss 3 different applications/systems as a framework for illustrating the overall effects that instructional technology can have on higher education. By examining faculty members' reasons for their adoption, we can more adequately prepare for the introduction of new technologies. Furthermore, examining the unintended consequences of these adoptions allows us to critically review and comment on technology's overall impact on the higher education teaching and learning environment.

Visual Presentation Software (PowerPoint™)

Microsoft Corporation's PowerPoint™ is one of, if not the most, utilized pieces of technology in higher education classrooms. For many the term

PowerPoint™ is synonymous with a visual slideshow presentation and has no serious competition in that market. One can walk into many classrooms, especially those with larger enrollments and find a screen with a recognizable PowerPoint™ design style projected on it. Although originally developed as a business application, adoption of PowerPoint™ into classroom instruction increased rapidly for numerous reasons including:

- Ease of use
- Ability to provide visual representations
- Ease of updating and recycling lectures
- Ease of generating lecture outlines and handouts

The combination of these factors created an efficiency factor that incentivized teaching faculty to adopt PowerPoint™. An analysis of why PowerPoint™ became so popular is simple. A short learning curve, combined with time savings and potential to improve teaching, is the perfect formula for instructional technology adoption. Any tool that enables faculty to do their job more efficiently and effectively without significant cost or time commitment is likely to be considered (Groves & Zemel, 2000).

Unintended Consequences

No other technology used for instructional purposes has received as much negative criticism from those in higher education as PowerPoint™. Although widely adopted by faculty in all disciplines, PowerPoint™ is frequently shunned as a crutch for both faculty and students. One vocal critic (Tufte, 2003) has argued that PowerPoint™ condenses knowledge into bite-size chunks to be consumed passively by students whose eyes focus only on the screen and never gaze on the instructor. The criticisms do not stop there. Instructors no longer need to prepare for lectures, because they can simply display and read from the slides. Others lament that students no longer need to take notes as the slides are made available, either online or in printed handout format. Detractors state that classroom time has been reduced to a mindless viewing of information bits. Students have also complained that some instructors have become worse teachers because of the way they use PowerPoint™ (Young, 2004). This software may even be brought into a different debate concerning the provision of handouts to students. Because of technical ease, many instructors simply provide printouts of their slideshow presentation to students. In many cases, handouts have become interlinked with PowerPoint™ usage, creating further criticism by those who decry student handouts. One of the consequences in providing printouts of PowerPoint™ slides or a variety of other formats is a reduction in handwritten note taking by students. We may be turning our students into passive learners by depriving them of the opportunity to develop their own cognitive organizational skills (Brazeau, 2006). Especially among novices in a topic area, student note takers perform better in recall tests than non-note takers (Shrager & Mayer, 1989).

Aside from the philosophical debate on whether students should receive handouts, the actual layout of PowerPoint™ handouts by faculty members has also been criticized (Kinchin, 2006). Facilitation of learning may be hampered by the linear view of presented information which is inherent in the default PowerPoint™ slide printout settings. Formation of proper cognitive structures may be limited as students adopt the organization patterns of the instructor, rather than form their own schemas.

Many of those viewpoints are extreme, but illustrate the denigration that some educators have for this application. While it is true that this technology could be "abused" in the above-mentioned ways, how the technology is used, not the technology itself should be blamed. PowerPoint™ is just one of several tools that instructors might employ for classroom teaching. The ultimate decisions concerning adoption and usage strategies belong

to the instructor. However, others point to specific attributes of the technologies that shape general usage. Adams (2006) posits that the nature of the medium itself alters how faculty members engage students and present learning materials. Instructors tend to utilize the software in its most basic form and because of pre-established text layouts and linear sequencing of PowerPoint™ slides, learning materials are often forced into that structure.

In spite of the many harsh criticisms, there are also exceptional uses of PowerPoint™ that assist students in learning. When coupled with an engaging instructor and appropriate instructional strategies that promote cognitive ability, PowerPoint™ can be an excellent tool. The danger that we face is unequivocal acceptance of this piece of software by novice instructors as necessary for good classroom presentations.

Learning Management Systems

Learning management systems (LMS), also referred to as course management systems, provide faculty with relatively easy ways to manage learning materials and class communications. These web-based systems serve as a replacement or alternative to individual course web sites created by pioneering and innovative faculty. With very little training, instructors can distribute content; administer quizzes; securely post student grades; and provide a host of other education-related activities. Enabling instructors to deliver learning content like never before, LMSs quickly became a popular technology for college and university faculty members (Morgan, 2003). Although constructed to meet the needs of distance education courses, LMSs are also used as support tools for traditional face-to-face courses (Morgan, 2003). In hybrid courses, LMSs host supplementary materials and/or facilitate course communication while other learning activities occur in the face-to-face setting.

LMSs have now become the goliath instructional technology and have permeated institutions of higher education. Once implemented, these systems reach almost every faculty member and student on a campus or in a distance program. Blackboard™ is the most frequently used commercial system (Lane, 2008), although Sakai™ and Moodle™ are other companies that have penetrated the higher education marketplace (Salaway, Caruso, & Nelson, 2007). The rapid rise and popularity of these systems are due in part to the efficiencies they can create for faculty members (Britto, 2005). An instructor does not have to possess html coding skills in order to transmit information to students via the Web. Posting learning materials, linking to other Web-based resources, collecting homework assignments, communicating with students, and displaying grades are relatively easy features within an LMS. Administrators may also be seduced by the possible efficiencies of course delivery, reduced physical space demands, uniformity in technology usage, and greater access to higher education (Coates, James, & Baldwin, 2005). Increasing college enrollments, along with pressure to provide higher education opportunities to the lower economic strata, has forced administrators to consider LMSs as a way of partially meeting those demands (Milliken & Barnes, 2002).

Depending on how faculty members utilize the features, LMSs provide both advantages and disadvantages to students. The major benefits to students include access to content they may not have gotten otherwise; easy access to course information (syllabi, grades, announcements); formative assessment opportunities; and anytime/anyplace learning opportunities.

Competition between institutions to display advanced technical capabilities has also been a contributing factor to rapid adoption. As the Millennial generation progresses through the education ranks, there has been more and more pressure to provide information via technology. To attract students that have advanced technology expectations, colleges and universities may attempt to provide robust systems as a form of competitive advantage (Coates et al., 2005).

Unintended Consequences

For all the benefits that LMSs provide faculty, students, and administrators, there are a set of unintended consequences that have negatively affected higher education. These consequences include a forced pedagogical structure, substantial resource expenditures, and student/faculty frustrations.

LMSs are not pedagogically neutral in that they present a structure that may influence how instructors use them in the educational process (Coates et al., 2005). The organizational schemas within LMSs entice faculty to simply upload and manage information, rather than actively engage students in learning activities. They can easily force a novice faculty member into teaching strategies based on the tools available (Lane, 2008). Many bemoan that LMSs have molded instructors into utilizing a specific form of instruction, much like textbooks sometimes dictate course content presentation. These technologies receive criticism (often undue) for forcing faculty to "teach" within a closed system. In this respect, technology drives the teaching, which is counter to what the majority of educators would desire. Instead of teaching approaches that utilize highly engaging and constructivist-oriented activities, faculty members may resort to lower-level content presentation merely because of an LMS's user interface. The more complex or interactive features such as discussion boards and formative assessment tools are adopted at a much lower frequency (Morgan, 2003). Future generations of LMSs should be more open, flexible, and learner-centered (Jafari, McGee, & Carmean, 2006).

LMSs have also had a substantial impact on both the financial and human resources provided to teaching and learning. Most of these systems demand expensive licensing fees. If not already in place, substantial investments in computing and network infrastructure are also needed to meet space, processing, and bandwidth requirements of the behemoth systems. Furthermore, adequate human resources in terms of network and system administrators, trainers, support personnel, and technology education specialists are necessary for LMSs to operate smoothly. Resources that could have been used for better learning facilities or more faculty members have been diverted to LMSs and the infrastructure necessary to support them. LMSs can sometimes become the figurehead for instructional technology at an institution, and because of the sometimes staggering costs prompt faculty members, particularly those less interested in instructional technology, to criticize the resource allocation. The big question is "Does the money invested in LMSs and their support infrastructure, provide an adequate return on investment?" Relatively few studies have addressed the cost versus return aspect of technology-based instruction (Roblyer & Knezck, 2003), and more research is needed in this area.

Perhaps even worse than overspending on LMS, is the mistake of under spending. Systems that encompass substantial numbers of student and faculty require support teams that can rapidly react to problems. Understaffed institutions find it difficult to swiftly respond to issues and correct problems. Lack of prompt attention to unresolved technical issues results in frustration on behalf of students and/or faculty. Faculty members do not have enough time to devote to technical troubleshooting nor to make accommodations in the event of system problems. Students who rely on LMSs for course materials and information need the systems to be operating at 100% capacity (Salaway et al., 2007). If not, they may attribute the problems to course instructors and reveal their frustrations in end of semester course and instructor evaluations. Hence, faculty members may reduce their reliance upon and/or completely abandon systems in which they cannot trust will function properly (Morgan, 2003). If administration does not adequately fund LMS support they risk substantial bad publicity when problems arise.

Because of the extensive costs associated with LMSs, there is pressure to entice faculty to use

them in their respective courses. Cost justifications can only be made if a critical mass of users exists. LMSs are sensitive to economies of scale and are financially feasible only when a substantial number of faculty and students use them. As the number of instructors increases, the numbers of instructors who will use them in less than ideal ways also increases (Parker, Bianchi, & Cheah, 2008).

Finally, from a business perspective, market dominance of these systems has greatly influenced some of the unintended consequences. Once a school adopts an LMS, the pressure to maintain and retain the system is immense, regardless of the applicability or perceptions of effectiveness. From a financial standpoint, implementation costs are usually very high in terms of system cost and institutional processes necessary to purchase, install, and deploy. A change in LMSs requires substantial time investments by IT administration, as well as time for faculty training and conversion of courses to the new system (Sturgess & Nouwens, 2004). The perception of abandonment of a particular system may signal to faculty failure on the part of administration. Once an LMS is established at an institution, the LMS company has great leverage with future contracts as they realize the difficulty colleges have in abandoning any given LMS.

Audience Response Systems

Audience Response Systems (ARSs) are perhaps the latest instructional technology adopted on a wide scale basis. Also known as clicker systems, these technologies have slowly grown into a staple technology for those instructors desiring to bring interactivity into lectures (Cain & Robinson, 2008; Draper & Brown, 2004).

Today's generation of ARSs are popular for a number of reasons: simplicity of use, do not require extensive technical support or changes in teaching style, and provides valuable information to the instructor (Cain & Robinson, 2008). In comparison to other pieces of technology, ARSs are also relatively inexpensive. In addition, students have responded positively to the use of ARSs in the classroom. Large enrollment classes, in particular, have been targeted as potential areas where ARSs add value. Not only do they engage students, but they also give the instructor feedback concerning class comprehension, opinions, and/or demographics. Research on strategies utilizing ARSs indicate positive effects on interactivity (Hatch, Jensen, & Moore, 2005), exam performance (Preszler, Dawe, Shuster, & Shuster, 2007), and instructor evaluations (Cain, Black, & Rohr, 2008).

Unintended Consequences

As of now, there have been no reports on unintended negative consequences of ARS usage. Like many other means of student assessment, there are concerns over academic integrity when using these systems (Medina et al., 2008). In addition to the fact that it is extremely difficult to ensure that students other than the device owner are providing answers, the potential exists for students to observe other student responses before answering. Of course, academic integrity issues exist in almost every grading/testing environment; therefore, these concerns are not new to education. There are strategies that faculty can use to reduce the impact of integrity issues, such as only using them for interactivity or formative feedback purposes and not for graded quizzes.

One of the potential consequences of the widespread popularity and adoption of these systems is their unequivocal acceptance as improving teaching performance. As with any instructional technology, equating technology use with instructional improvement can be a false assumption (Henshaw, 2006). Without sound pedagogical strategies, these systems could simply be relegated to a trivial device in the classroom and provide little to no educational value. It is imperative that those in the field of educational and instructional technology educate users on effective use of ARSs.

Another potential concern is that without effective instructional design, instructors could inadvertently incorporate meaningless interactive sessions. In other words, faculty members may adapt to teaching with ARSs simply because of their ease of use in gaining student feedback. The danger is that they may abandon or never consider other teaching strategies that are more appropriate for the learning outcomes in their courses. Just like visual presentation software and LMSs, faculty might teach according to the capabilities of the software. Although, ARSs offer a variety of benefits, they are not pedagogically neutral.

FUTURE TRENDS

Having spent the first part of this chapter looking at instructional technology from a historical perspective, let us now turn our attention to the future. Some of the newer technologies, social media in particular, offer the next wave of innovation into the teaching and learning environment (Alexander, 2006). Examples of these newer applications with education potential include blogs (Williams & Jacobs, 2004), wikis (Lamb, 2004), online social networks, video and photo sharing and a host of other open social software. Described as Web 2.0 (O'Reilly, 2005) applications, these tools are permeating student "life" and are beginning to have profound impacts on how we socialize and communicate with each other. Given that ease of use, time efficiencies, and improved teaching performance have been factors leading to successful adoptions of current technologies like PowerPoint™, ARSs, and LMSs, what is the likelihood that these newer applications will enter and influence the higher education environment?

These newer social technologies are extremely easy to use and inexpensive (or even free) which increases the likelihood for adoption. Although not created for educational use, these applications hold promise for teaching and learning activities. The big question is whether these types of technologies will assimilate into the educational environment or remain separated from teaching and learning activities. Because Web 2.0 applications compare favorably in regards to adoption criteria with current technologies, the battle to implement them into the teaching and learning environment is most likely to revolve around confrontations with campus traditions, and less on the usability and effectiveness of the applications themselves. Technology, in any form, is about change and that change often runs counter to institutional traditions and history (Katz, 2003). What will be the impact of paradigm changes in terms of social communication? Will the institution of higher education adapt to these changes quickly, or cling to more traditional definitions of what it means to communicate, share, and learn? Web 2.0 applications in particular tend to challenge the concept of knowledge authorities and promote a more collective intelligence approach (Boulos & Wheeler, 2007). The potential exists for Web 2.0 applications to dramatically alter higher education. How the institution of higher education responds to the questions above will determine the extent of use of these newer technologies and the effects they will have on college teaching and learning.

DISCUSSION

The proper critique of instructional technology requires an examination of the unintended consequences on the overall education environment. One of the objectives of this chapter was to provide critical commentary on how instructional technologies have been integrated into and affected higher education. One specific question addressed was "has the use of technology simply supplemented traditional classroom learning or has it fundamentally altered the higher education teaching environment?" Based on the examples given above, instructional technologies have indeed influenced institutions of higher learning.

In addition to the general effects that it may have in the classroom, technology impacts the very nature of higher education. As illustrated earlier, the adoption of instructional technology has increased the demand for support personnel, network infrastructures, computer hardware, and software licensing. Are the costs offset by improved teaching, efficiencies, and expanded enrollments or are they simply depriving improvements that could be made from other means?

The change may not be completely visible from an outsider's view, but when critically analyzed through a framework of established technologies, one can see some of the changes that have taken place. Instructional technologies can modify a faculty member's mode of teaching merely because of its feature and structure. Instructors may unwittingly adjust to a teaching style because the technology features channel learning material presentation into a specific format. The interaction with technology from both faculty and student perspectives causes a change in the teaching and learning environment. Whether that change has been positive or negative can be debated.

CONCLUSION

To prepare adequately for implementation of future learning technologies, we should retrospectively examine currently implemented technologies and identify the criteria that made them successful. An analysis of such highly adopted technologies like visual presentation software, learning management systems, and audience response systems reveals some common characteristics. These technologies made their way into mainstream education for a number of reasons. First, they were easy for faculty to learn and use. Second, they met at least one of 2 valuable needs: enabled faculty to improve teaching and created efficiencies in the teaching and learning process. Most faculty members are constrained by competing demands on their time, which often limits their willingness to experiment with new teaching practices. Anything that requires substantial training and trial and error is less likely to be adopted. In our attempts to predict other technologies that will play a major role in the future of education, we should remember and consider those common characteristics.

This chapter has also provided commentary on some of the unintended consequences that instructional technology had had on the teaching and learning environment. Although these technologies offer multiple benefits over traditional forms of education, we must also be conscious of the possible alterations to the teaching and learning environment. Instructional technologies not only provide new ways of teaching, but they may also have deleterious effects on the process. We must continue to examine and analyze all effects of technology on education and confront those that hinder us in meeting all the goals of higher education.

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Chapter 11
Web 2.0 Technologies for Problem-Based and Collaborative Learning: A Case Study

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ABSTRACT

Collaborative problem-based learning (PBL) has a well established history within medical and health care education. Undergraduate nursing students at the Glyndŵr University undertake PBL to explore ethical issues of health care; traditionally these students meet in person to discuss scenarios, provided by tutors, and present the product of their deliberations to the rest of the class. The geographical dispersion of the students has meant that most discussions have been limited to those times when the students are physically on campus by virtue of their timetabled classes. By using Web 2.0 technologies, students are able to collaborate at distance, at a time that suits them. This chapter describes how students have used these emerging technologies to share ideas and resources to prepare for class presentations; described also are the underpinning theories that inform this work together with an analysis of student use and feedback.

INTRODUCTION

This chapter describes how Web 2.0 technologies, in particular wiki pages, have been used to facilitate group work with undergraduate nursing students at the Glyndŵr University, United Kingdom. We begin by examining the theoretical basis for applying this technology to facilitate collaboration; we describe the nature of the problem based group work and its pedagogical value; we analyse, from the perspective of both tutors and students, the effectiveness of this approach and finally we examine the nature of discourse between students, freed from the constraints of the traditional classroom environment. Our conclusion supports the view that, sympathetically used, Web 2.0 technology

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can enhance the level of "conversation" between students, enabling students living remote from the university campus to engage productively in group tasks and providing a flexible forum for collaborative work.

In employing a wiki to facilitate student collaboration, tutors are able to observe the process by which students develop their final presentation, providing an opportunity to scrutinize group dynamics. We also explore how the "facebook generation" adopt language styles which are distinct from the academic language normally used within the formal classroom setting.

BACKGROUND

The past few years have witnessed an explosion of Web 2.0 applications. Social networking sites such as "Facebook" and blogs have become increasing popular, especially with young adults, and many of us in higher education are beginning to consider how this phenomenon can be used to facilitate learning. We now have a 'connected society'; connected not by face-to-face interaction but by the internet; geographical location is no longer a barrier to discourse and interaction. Whilst the social aspects of learning have long been recognised by educational philosophers such as Vygotsky, it is only recently that new theories of learning have started to emerge that reflect the burgeoning potential of the digitally connected society. Siemens (2004) has coined the phrase "connectivism" to describe how learning can reside outside the individual and how individuals can contribute to a social network of understanding and knowledge. Connectivism applies to that nebulous entity, the internet and, one supposes, to the growing use of mobile devices to access, and contribute to, a shared, socially situated body of knowledge. The scope of this chapter, however, is narrower; focussing on a single aspect of emerging technologies, the wiki, and how this can be used to exploit the potential of social networking to enhance the learning of the individual.

O'Reilly (2007), in exploring how Web 2.0 technologies allow for "remixing" of data from various sources, describes how individuals use technologies to collaborate to a common cause; this "harnessing of collective intelligences" (O'Reilly *ibid*) generates a product that is greater than the sum of its parts. This has resonances with the social constructivist approach to learning of Vygotsky and the connectivist approach of Siemens. Boulos *et al* (2006) have highlighted the potential of wikis to help facilitate learners in constructing their own knowledge, leading to a deeper understanding. Based upon this theoretical underpinning, the authors determined to examine the potential of wiki technology to facilitate collaboration between groups of geographically dispersed nursing students.

ISSUES, CONTROVERSIES, PROBLEMS

As Adams (2004) observes, nurse education is not simply a matter of presenting students with information to remember and reproduce in examinations; it requires the students to think creatively, to collaborate and to critically reflect upon practice. Whilst by no means unique in this respect, nurse education lends itself to a constructivist or connectivist approach to learning, especially when aligned to problem-based learning (PBL). Cognitive conflict (Savery and Duffy, 2001), whereby learners are presented with problematic scenarios that challenge their preconceptions provides a basis for reflection and, through collaboration, for constructing new paradigms of practice. Rather than providing them with solutions, students are encouraged to explore scenarios, to construct frameworks of understanding and to resolve personal and collective conflicts.

Problem-based learning and collaboration is not new in nurse education (Davis and Harden, 1999; Wood, 2003) but emerging technologies

provide an additional dimension whereby students, separated by location or time, can collaborate, share resources and participate in discursive learning (Gulati, 2006). Additionally, those students that feel uncomfortable in contributing to classroom based discussions often feel liberated by the opportunity to contribute to discussions from the comfort and security of their own homes. That is not to say that adverse inter-personal dynamics that one may see in the physical classroom are absent from the virtual world; intimidation (Doolan, 2006) and bullying (Reigle, 2007) are as hurtful in the virtual world as they are in the real and careful tutor monitoring is required to ensure that debate is both constructive and polite. Our own experiences, described later, demonstrate that misunderstandings can quickly develop into personal disputes.

It is a widely held belief that adult learners (the over 25's) are uncomfortable with emerging social networking technologies; "Facebook" and other social networking sites seem strictly for the teenage and young adult market but our experience is that mature students quickly adapt to using new technologies. Analysis of student contributions to the wiki pages show no correlation between the age of the student and the level of activity demonstrated.

PROBLEM-BASED LEARNING (PBL) FRAMEWORK

Glyndŵr University is located in Wrexham, north Wales and works closely with the demands of the local economy. The University is addressing the widening participation agenda and its aim is to be "open to all". Approximately 110 nursing students are recruited per academic year. The Bachelor of Nursing (Hons) degree runs over a 3-year period and is evenly split between theoretical modules and clinical practice. Nursing cohorts are predominantly female and aged between 18 years – 44 years. The students generally live in the north Wales region and this represents a diverse geographical area, with many students living in rural locations.

The PBL framework is used to deliver information to student nurses about possible trauma issues in a clinical practice setting. The 'trauma' based PBL is introduced at the end of the 2nd year of a pre-registration Bachelor of Nursing (Honours) Degree Programme. The PBL is used to develop critical thinking and problem solving skills (Hsu 2004). In nurse education, one of the main aims of PBL is to promote autonomous learning by encouraging students to take some responsibility for their own learning (Ousey 2003). This is done by the identification of the student's own learning needs in relation to the problems highlighted within the weekly PBL scenario. The PBL is timetabled for one day a week over a five-week time span. Each week the students work in small groups of about eight and each group is facilitated by a nurse tutor. The tutor's role is purely advisory, as all the student groups are encouraged to nominate a "chairperson" (student) from their individual groups. The chairperson helps focus the group towards the work required and makes suggestions on 'communicating' via the wiki page.

The main scenario is based on a young female who is involved in a road traffic accident. She requires cardiac pulmonary resuscitation (CPR) at the scene of the accident and is admitted to the emergency room (ER) via the ambulance service. This scenario, as well as exploring trauma issues, also raises issues around possible "real life" ethical dilemmas. The main format of the first PBL scenario, and the subsequent additional weekly information, is organised to encourage individual student learning with the students being principally in control of the area for exploration.

For the first PBL session, each group is given an ethical scenario to work on. The following week each group has to debate their argument, based on current and relevant evidence, in a cohort discussion. For example, ethical dilemmas may include the following: whether to continue

Table 1. Wiki usage by student group

Group Number	1	2	3	4	5	Total
Wiki Revisions	99	104	108	109	77	497
Percentage of Total	20	21	22	22	15	100

with CPR or not, other groups debate whether to allow the patient's "partner" in to ER or not. During the following four weeks the scenario is developed and additional layers of complexity are added. Groups are provided with additional information and each group must then work on this to expand their presentation. Student self-directed study time is also timetabled to enable students to gather information from such sources as books, journal articles and the web in order to support each feedback session. These scenarios are all related to the same patient situation and encourage the separate groups of students to solve the highlighted problems they decide are important to their particular group. The flexibility of choice allows the students to identify their main issues and, as a result, in control of their own learning. This demonstrates the constructivist approach of PBL (Hsu, 2004).

Prior to the PBL scenario being introduced to the students, an introductory lecture is delivered on how to use the "wiki page". The students are encouraged to use the wiki page as a resource tool and also as a means of communication to organise their group work.

Student use of the Wiki Pages

Students were divided into five groups of eight and each group given access to their individual password protected wiki page; collaboration took place over a five week period. Analysis of wiki page usage (Table 1) shows a total number of page revisions of 497 over the five week period, giving an average of just under one hundred revisions per week or twenty revisions per group per week. Groups 1 to 4 made a similar number of revisions but Group 5, which had a number of students away on other duties for the first week, registered a lower number. We see no significance in the slight variation in the number of revisions.

Simple numerical analysis of wiki page revisions gives an indication of activity level but not the nature or quality of that activity. Student contributions were divided into three categories; non-task related posts, task related contributions (including sharing of original documents) and resource sharing, which includes sharing of internet resources; total contribution were roughly equal across these categories but task- specific contributions account for 65% of the total.

We believe the non-task related posts to be an important element in generating a sense of community within the student groups. Often these posts would be about home life or difficul-

Table 2. Type of wiki contribution by student group

Group Number	1	2	3	4	5	Total
Non-task posts (%)	43	39	43	20	30	35
Task-related contribution (%)	23	32	28	25	40	30
Resource sharing (%)	34	29	28	55	40	35

ties students were experiencing; other students would respond with messages of support and offers of help. Creating a "team spirit" and bonding members of the group gives a sense of identity and a common goal. Sharing personal information in this way also empowers students to share their own views and original writings in the safe and secure knowledge that these will be received by others in a supportive and respectful manner. Inappropriate postings, "flaming", was observed in one group (Group 1), prompting one student to comment "*However the wiki page was used inappropriately to air disagreements which discouraged some member* [*sic*] *from using it."* Although students were given clear guidance about appropriate behaviour, it is impossible to ensure that this is observed at all times and tutors must monitor posts on a regular basis.

Task-related contributions fell into two main categories; identifying existing resources and sharing of the students' own work. Those contributions which simply identified a resource without additional comment received few, if any, responses; suggesting that these were seen as being of little value. Sharing original work or reflections upon resources generated many more replies and students began to construct understanding; we observed peer-teaching and team work, a core objective of the exercise.

Language Used

It was evident, from a very early stage, that students were tending to adopt very informal use of language, much akin to the shorthand used in SMS messaging ("texting"). Typical examples include:

"c u tomorrow" - see you tomorrow

"hope u are all happy" - hope you are all happy

"Dus any 1 no" - does anyone know

As described earlier, a very small minority of students became embroiled in flaming and used inappropriate language which required tutor intervention. Other students, normally reluctant to contribute to classroom discussion, embraced the opportunity to debate and contributed enthusiastically. This behaviour, which would not occur in a traditional face-to-face classroom, suggests that students' perception of the electronic medium and the "rules" of social engagement weresignificantly modified. Without the physical classroom environment and isolated from direct contact with tutors and peers, new rules of discourse developed. Students, in effect, established a set of social norms specific to the virtual environment within which they were operating. Souter (2008) describes a similar experience with her students when using the "Second Life" multi-user virtual environment, noting what she terms as "naughtiness" in the behaviour of some students. Whilst it is important to ensure that debate is conducted in a professional manner, freeing students from the strict code of conduct expected in the classroom setting may facilitate a deeper, more reflective learning experience. By employing informal language to discuss complex issues students are demonstrating, it is suggested, clearer understanding and the ability to relay this understanding in the language of their peers. Interestingly, when required to return to the reality of the physical classroom in order to present their findings to tutors, students reverted to the expected protocols and language of that environment. Further work is needed to establish whether different groups of students develop different sets of social norms for the "virtual classroom" and we are currently extending our research to examine such aspects.

Student Feedback

Student feedback was gathered using a short questionnaire consisting of a number of statements which students were asked to grade on a five point scale from strongly disagree (1) to strongly agree (5). Students were also given the opportunity to give free-form comments on their own experiences of using the wiki.

Table 3. Results of student questionnaire (aggregated results from 33 returns).

Statement	Score (1 = strongly disagree, 5 = strongly agree)	Agreement (as a percentage)
I found the wiki easy to use	3.76	72%
The wiki was useful in helping us share ideas and resources	4.15	83%
Our group work improved because we used a wiki	3.38	68%
I would prefer to use email to share ideas and resources	2.48	50%
I prefer to meet face to face or by telephone	3.15	63%
I would prefer tutors could not see our wiki pages	1.85	37%
I would like to use a wiki for group work in the future	3.79	76%

The questionnaire returns indicate that students found the wiki useful, that it improved the quality of their group work and that they would like to see this technology applied more generally across their studies. A significant number of students would, however, prefer to use face-to-face meetings or telephone contact for collaboration, rather than e-mail or wiki pages, indicating that not everyone is entirely comfortable using web-based communication tools. Interestingly, the students clearly prefer that tutors have access to their on-line discussions; this may reflect a desire to demonstrate the level of contribution or the need for tutor moderation. This, however, raises questions about the type of language and social rules used by these students in their on-line discussions and the fact that students then readily acquiesce to the more rigid formality of the physical classroom. This dichotomy of behaviour suggests that this group of students perceive their on-line behaviour as entirely appropriate within the context of that medium but not appropriate for the "real-world" setting of the classroom.

Example Student Comments

I felt the wiki page was central to our group work – everybody contributed relevant information and it was an excellent form of communication.

(DE).

It was an excellent way to help develop my knowledge …. This will be good to use during each module throughout nurse training.

(RW)

I found it useful for sharing information and keeping in contact with group members because we all lived in different areas. However the wiki page was used inappropriately to air disagreements which discouraged some member [sic] *from using it.*

(BW)

Some of our members lived in different areas so we could discuss things without meeting up.

(SS)

It was just seen as extra work among our group. We work that well as a team we'd have had the same results without using the page.

(LM)

I like it because you could share information with others. I didn't like the way everybody else could change what you had done.

(JT)

The free-form comments from students provide an interesting insight to some of the benefits and some of the disadvantages of using a wiki page for collaboration. The vast majority of feedback

received in this way described the benefits, in particular how geographically-dispersed students could still collaborate in a meaningful and constructive manner. Negatives to emerge were inappropriate behaviour (flaming) and the fact that contributions could be changed or deleted by another.

SOLUTIONS AND RECOMMENDATIONS

Facilitating collaboration between students who are geographically dispersed or in employment can be problematic; Web 2.0 technology provides an opportunity for students to contribute to group work where and when they like. Freed from the confines of classroom etiquette and geographical isolation, students are able to express their views and contribute to group work in a meaningful and constructive manner. Interestingly, students themselves evolve their own social norms and use language which is meaningful to their particular cohort; provided it is managed appropriately, we argue that this facilitates a deeper and more reflective learning experience. Disadvantages which arise through inappropriate behaviour, whether that be aggressive language or changing / deleting the work of another can be overcome by careful and diligent tutor moderation.

We believe that on-line collaboration through the use of Web 2.0 technologies such as wiki pages provide an opportunity for students to explore their own understanding within a supportive and non-threatening environment. By applying these emerging technologies to problem based learning we recognise the value of the constructivist approaches to learning and the opportunity for "harnessing of collective intelligences" (O'Reilly *ibid*). For tutors looking to assess team work, wikis provide an insight into both process and group dynamics; something difficult to achieve in traditional classroom teaching.

FUTURE TRENDS

Our experiences have convinced us to broaden our use of these technologies to other student groups. Social networking applications and multi-user virtual environments have the potential to enrich the learning opportunities for our students but to exploit this fully we must gain a deeper understanding of the social interactions that take place within such environments. Emerging technologies present us with a new opportunity to engage students with their own learning; Web 2.0 tools provide a platform for a constructivist and connectivist approach to learning and teaching. We may need to review our previously accepted pedagogic 'truths' if we are to exploit the potential of these technologies; this is a challenge to all of us engaged in such teaching. Conversely, these technologies may enable the visionary work of Piaget and Vygotsky to be realised.

CONCLUSION

This chapter has detailed our experience of using wiki pages to facilitate collaboration between adult learners on a nursing degree at Glyndŵr University, Wales, United Kingdom. The role of problem-based learning in a constructivist approach to teaching has been described and we have explored how student interaction within virtual environments differs from that observed within a traditional classroom. Freed from formal classroom environments, students are able to express themselves in the language of their peers and this, we believe, facilitates enhanced learning, greater debate and a reflective approach to discussions. Further work is needed to better understand how social norms develop within the virtual environment and how this can be exploited to assist learning. We believe that Web 2.0 technologies provide a valuable opportunity for learners who are geographically dispersed or who have time constraints to participate in face-to-face group

work. Although student work in this case study was not formally assessed, tutors are able to review not only the end product of collaboration but the process, enriching the assessment potential. In light of our experiences, we have reviewed our use of PBL and will introduce formal assessment of both final group presentations and wiki contributions in the near future.

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Chapter 12
Information Literacy in the Digital Age:
Implications for Adult Learning

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ABSTRACT

The current debate within the realm of information sciences focuses on a new threat to society – the threat of an information and technologically illiterate population. This chapter focuses on a critical discussion of information literacy and the fallout of academic achievement amongst adult learners. The chapter takes into consideration the current research on information literacy, a historical perspective on information literacy, current best practices in supporting information literacy in the digital age, and as well as an active action plan on combating this new threat. Central to this discussion, the author evaluates the current literature on information literacy and best practices highlighting research from years 1998-2005.

INTRODUCTION

In the age of information, and communication technology, the opportunities for growth, development, and of learning are limitless. For the adult learner technological advances such as the World Wide Web or the Internet, computer storage, and in telecommunication and networking have made it possible for institutions of learning, schools, libraries, and higher education to compile vast amounts of information. However, with these exciting innovations comes the ideal of adult learners to critically use information learning. While recent legislation such as the No Child Left Behind and other accountability policies indicate a positive correlation in testing and achievement, the reality shows that student undertaking a university education does not align with achievement and literacy rates that have been reported. It is now, at the adult learning stage were where learners in post secondary learning settings in post secondary settings are not equipped to analyze, evaluate or think critically about information.

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As we move forward into the 21st century researchers and educators are starting to asked the central, most fundamental question of why adult learners do not to possess capabilities in critical thinking, information analysis, or in information evaluation. This leads to the topic of discussion - information literacy in the digital age – where information and communication technology have become central to the interaction of society. As institutions of higher learning prepare students for citizenship in the age of information, communication, and technology, information problem-solving skills and critical thinking becomes paramount, especially for adult learners. Adult learners must learn to make meanings from complex amounts of data easily available through countless sources. Beyond theses basic skills – skills of reading, writing, and arithmetic, the students who will one day become active citizen and workers of society will needs to develop complex analytical skills. Technologies such as networking and telecommunication systems have put an unprecedented volume of information at our fingertips. Yet, many are unaware of what is available, when the information should be used, and to what extend do reliability of such information lies? Yet, with programs in accountability, research, and in technology, adult learners are still under prepared in areas adequate and effective research or in critical thinking. The aim of this chapter is to provide a historical perspective of information literacy and its connection to adult learning. This chapter also hopes to present positive solutions through identifying best practices used to promote information literacy and ways adult learners can benefit.

CONTEXT

Increasingly, among 18-30 year olds, the Internet has been used as the primary tool for communication and research. Gerard Delanty, a British sociologist, has argued that a major cognitive shift is currently taking place in society. The divisions between professional and lay knowledge (in the sense of expertise) are dissolving (Delanty, 2003: 80). A new profession, the learning technologist, is emerging. The application of technologies to teaching and learning has created a new term – *cybergogy*. Research on the impact of technologies on educational practice is only beginning. Most of this research is focused on 'blended' (online and face-to-face) learning and on the introduction of information and communication technologies for curricular and instructional purposes. Studies drawn from psychological analysis have shown that technology has an active role in fostering the development of higher cognition.

Teaching and learning in the digital age is a moving away from the passive acquiring of factual information towards the active application of knowledge. The focus is on assisting adult learners to construct knowledge both as independent self-directed enquiry and communally in peer groups in order to demonstrate their knowledge attainment through enactment and application.

To meet this goal, scholarship has identified the need to engage in active research; develop professional enrichment to engage the learner with the content; share research findings and develop students with the skills and abilities to critically think and analyze information from a variety of resources including print and electronic mediums. However, with the lack of opportunities to engage adult learners within a technologically rich learning environment that concise with opportunities for critical thinking, we must begin to rethink our approach to developing adult learners into information literate knowledge producers and consumers. This leads to the discussion of information literacy in the digital age.

BACKGROUND

Definition and Overview of Information Literacy

With the explosion of information now available electronically and in print, individuals must be able to decipher what is true from that which is false. Currently research (Behren, 1994; American Library Association, 2001; Orme, 2004; Owusu-Ansha, 2004; D'Angelo, 2004) has concluded that in information literate person has the following:

An individual's ability to:

- recognize a need for information;
- identify and locate appropriate information sources;
- know how to gain access to the information contained in those sources;
- evaluate the quality of information obtained;
- organize the information;
- use the information effectively.

Looking at the above criteria and the complexity of such attributes, The American Library Association (2001) defines information literacy as a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information."

The defining attitude that sets this definition apart from other main stream definitions is that the American Library Association (2000) states that information literacy is a survival skill in the information age and that information literacy forms the basis for lifelong learning. As explained by Orme (2004) information literacy is common to all disciplines, to all learning environments, and to all levels of education. Information literacy enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning.

Although the definition of information literacy is ever changing, both qualitative and quantitative data (American Library Association, 2001; Behren, 1994; Brown, 2003; D'Angelo, 2004; Marcum, 2002; Orme, 2004; Owusu-Ansha, 2004; Zabel, 2004) states that information literacy involves the skill in which analyzing, evaluating, and synthesizing are important for the advancing of teaching and learning practices for adults. This concept requires a fundamental ability to critically think and evaluate information content. According to Omes (2004) an understanding of the technological infrastructure on which information transmission is based, including its social, political, and cultural context and impact, has an effect on whether the students can effectively interact with the information presented.

In a similar debate, the Commission on Colleges, Southern Association of Colleges and Schools (2004) states that in order for a post secondary student to become a productive member of society, information literacy, they must be paramount. Such learners, in order to be competitive with the global economy, must possess have the ability to locate, evaluate, and use information to become independent life-long learners. In order for the student to possess these skills, the educational environment has the obligation to facilitate in an educational setting, where these skills are merged into the curriculum and are taught as such. In this, setting individuals become engaged in an active, self-directed learning activity, where the instructor facilitates the learning by looking beyond their resources that will enrich the learning environment (Rockman, 2003).

Conversely, information literacy entails more than just knowing how to read, write, or find information. This is the foundation for information literacy, but information literacy requires one to think critically and use an analytic model when evaluating information or in problem solving. This is in sharp contrast to other forms of literacy's that exist (e.g., computer literacy, technology literacy, and literary literature).

MAIN THRUST

Discussion: Understanding Information Literacy

Recent literature on secondary and post secondary information literacy preparation has infiltrated many areas from education, to science, to information technology, all the way to liberal arts and social sciences. However, what is this literature actually saying when the discussion turns to prepartion? Information compiled from several sources indicates information literacy relates to a macro level problem within in high school and undergraduate college. For the purposes of this chapter, we will examine the major and broad issues of information literacy dealing with the K-12 Education and university setting.

Recent studies (Behren, 1994; American Library Association, 2001; Marcum, 2002; Brown, 2003; Orme, 2004; Owusu-Ansha, 2004; D'Angelo, 2004; Mani, 2004; Zabel, 2004) have concluded that the bottom line issue with information literacy is lack of preparation. According to W.E Crouse, (2004), who conducted extensive research with high school teachers indicated that student research papers had regressed to the point that the completed work represented nothing more than a "point and click" exercise. Moreover, she discovered that 70% of student within high school English courses lacked the ability to evaluate and apply critically think strategies to construct organized class reports and essays. Furthermore, the article points out that the students on university campuses particular undergraduate students, lack carried the same basic level of analysis with them to freshman composition. Riedling (2002) points out that basic research and analysis skills were not present in undergraduate students who lacked the ability in understanding of how to use the resources of their campus library.

Behrens (1994) found that the term the volume of sources to be accessed, screened, evaluated, synthesized, and incorporated for research assignments exploded with the advent of electronic information were overwhelming to students. As a result, many students were bewildered and confused. Cudiner and Harmon (2001) stated, many undergraduates have found that their major research weaknesses are an over reliance on Web resources and an inability to find online academic information. Students feel confident in using search engines such as Yahoo and Google as relevant academic research sources in which to find information. Without the ability to discern what information is appropriate and credible, student find it difficult to find and use information gained from these search engines in their reports, thereby just using a "copy and paste" format to their reports. Clearly there is an explicit notion of the lack of skills sets obtained from previous forms of educational training and preparation. To this end it is important to understand and explore the teacher aspect of preparing information literate students.

According to the National Council for Accreditation of Teacher Education (2002) teacher candidates needed to be able to appropriately and effectively information literacy in instruction to support adult learning. Educators should understand the importance of using research in teaching and other professional roles, and know the roles and responsibilities of the education profession. Part of the prevailing problem of information literacy as indicated from NCATE deals the preparation of future teachers.

In order to effectively teach students information literacy skills, the teacher or faculty member themselves must posses the skills in order to transfer their information literacy skills to the students. Research conducted by the ALA (2001) and NCATE (2002) found that teacher often lack training, professional development, and course work in information literacy, thereby limiting their ability in teaching the subject to the students. In addition, many of the current curricula for adult do not permit information literacy components for courses across academic content. In addition,

the American Association of School Librarians (2001) indicated a lack of media professionals and librarians role in adult learning curriculum development, teacher professional development, or the testing process. Part of this lack of use of the librarian is the overall perception of what the role of the librarian is according to administration. In order to effectively integrate information literacy into an academic program either at the secondary or post secondary level, one should look into the viable option of collaborative partnership and the support they present in integrating information literacy.

Trends and Current Practices in Information Literacy

The first important aspect in the best practices in information is a uniformed set criteria of what information literacy consist of. Although there is no one absolute authority, there are a wide range of adopted characteristics. The Association of College and Research Libraries (2000) adopted the American Library Association's definition and characteristics of information literacy as "a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." In Characteristics of Excellence in Higher Education (2002), the Middle States Commission on Higher Education wrote, "Information literacy is vital to all disciplines and to effective teaching and learning in any institution." Thompson (2002) provided a summary of recent pronouncements by regional accrediting agencies that have placed greater emphasis on integrated information literacy than on separate library instruction. This also is true with national standards issued by education and library science professional organizations.

Since secondary and post secondary institutions vary widely in mission and student body, information literacy programs should be designed to meet specific needs rather than a prescribed set of criteria (Breivik 1998). Implementation of a particular approach or program depends on many institutional and situational factors such as audience, purpose, budget, staffing, facilities, and time (Grassian & Kaplowitz 2001). One such best practice is the Association of College and Research Libraries Best Practices Initiative (American Library Association 2001), which offers a comprehensive sets of best practice characteristics dealing with information literacy. These characteristics emphasize the importance of integrating information literacy throughout a student's entire academic career and advise using multiple methods of assessment for evaluating information literacy programs. The ACRL provides a detailed outline of the recommended components for excellent information literacy planning, collaborative information literacy pedagogy, outreach to academic departments and other efforts necessary for creating successful information literacy outcomes. Written from a behaviorist perspective, this document synthesizes these concepts into five standards that are then divided into twenty-two performance indicators. In addition, the ACRL documentation also lists a range of possible outcomes that can be used to assess student progress on each indicator. The document provides a very useful introduction that articulates a definition of information literacy and describes the connections between information literacy, information technology, and higher education, along with a discussion pedagogy, use of the standards, and assessments.

According to Arp, (2004), helping adult learners flourish in a learning community not limited by time, place, age, occupation, or disciplinary borders; joining teachers and others to identify links in student information needs, curricular content, learning outcomes, and a variety of print and nonprint resources; designing authentic learning tasks and assessments and defining the role in student learning is the aim of a collaborative information literacy program. By collaborative, Arp refers to a framework of a partnership between K-12

teachers, schools librarians, university faculty, and college and university librarians. Therefore, the development of curricular materials should be all inclusive of objectives established from the information literacy community that reinforce skill sets from both secondary and post secondary educational settings. According to Owusu-Ansah (2004) the most innovative and effective of the trends in promoting information literacy is the development a librarian/faculty/K-12 Teacher Collaboration Team in order to effectively gauge and design products, services, and education materials of information literacy, in which adult learners can obtain the benefit of effectively learning, retaining, and engaging in information literacy skills.

Another alternative in building information literacy skills is the formal information literacy courses. These courses range from for-credit to non-credit, from required to elective, and from distance to face-to-face. These courses give adult learners a basic to intermediate level knowledge of information literacy, whereby they can take back to their perspective schools, college degree area studies, or use on their own when writing reports.

Within information literacy course the American Library Association envisioned the role of the reference library as one committed to the process of collaboration and unique skill development. The reference library are to work closely with individual teachers and faculty in the critical areas of designing authentic learning tasks and assessments had integrating the information and communication abilities required to meet subject matter standards. By designing assignment that incorporate objectives and concepts of information literacy, student from secondary and post secondary settings are one step closer in acquiring the necessary skills in critical thinking and information analysis.

CONCLUSION

In order to promote information literacy, adult learners must first be exposed to the concepts and cognitive framework prior to the start of university education. This exposure needs to starts at the elementary level all the way through the university level. This exposure to information literacy will slowly build throughout series of hands on applicable experiences. This exposure must move past the conventional models of behaviorist teaching methodologies, but must incorporate constructivist and hands on approach on real world projects and assignments in which adult learners can transfer this knowledge from situation to situation and thus ultimately transfer this knowledge to the college level and beyond. Only then can the adult learner have the opportunity to develop information literacy skills, use the information literacy skills and then pass from literate to information competent and then to information fluent. We must fully understand what we expect adult learners to learn in order for them to become functioning information literate students in higher education.

It is not enough to know how to read or write or even use the computer, we must become information fluent, having the abilities to retrieve, retain, interact, problem solve, think critically, evaluate, and manipulate information for the purposes of research, for writing, and for knowledge acquisition. By providing educators, with strategies and models to incorporate into their curriculums, such as the Nine Information Literacy Standards for Student Learning and the Association of College and Research Libraries Best Practices Initiative, adequate professional development from librarians, and university faculty who have experience in information literacy, adult learners will be well on their way in being fit (fluent in information technology) and information literate. In addition universities and college campus must utilize the resources available to the library. This may involve developing a librarian/university

faculty/K-12 Teacher Collaboration Team in order to effectively gauge and design products, services, and education materials of information literacy, in which the adult learner can obtain the benefit of effectively learning, retaining, and engaging in information literacy.

The idea is for the reader to move past the initial stages of defining information literacy or what information literacy consists of. We must now move toward actual development, in which the adult learner is given the opportunity to learn these skills, retain these, and incorporate these skills into their daily lives. This can take place via many channels, however the most effective and efficient channel is the collaborative team, combining the knowledge of the librarian, with that of within the university and college faculty as well as with the use of information and communication technologies to give adult learners opportunities to engage in authentic learning environments that challenges their thinking on information literacy.

Educational background or level of the adult learner is important. Nor does it matter what academic disciplines the learning takes place. The idea of important is whether the adult learner has obtained the relevant skills necessary for academic and professional thought in an age of digital technology. By using the strategies and best practices outlined in this discussion, adult learners can be empowered through technology to take active step in solving the information literacy enigma.

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Chapter 13
Integrating Blogs in Teacher Education

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ABSTRACT

This chapter demonstrates some of the educational merits of blogs; including how blogs can be integrated in teacher education and proposing a methodology for evaluating blogs to meet the goals of reflection and technology literacy in teacher education. An undergraduate-level course was integrated with blog technology to help readers better understand the inquiry-oriented nature of the blog medium. This exemplar course modeled Web 2.0 technology to teacher educators and pre-service teachers who intend to integrate the technology into their future teaching. Surveys and interviews were used to investigate participant attitude toward blogs. The researcher proposes Zeichner and Liston's (1987) Reflective Index as a potential framework for evaluating the quality of reflection in blogs. It is expected that this instructional model of blogs will help educators, in particular teacher educators and instructional designers, to design courses to more effectively meet the goals of higher-order thinking required in 21st century teacher education.

INTRODUCTION

Some people do not regard teaching as a profession and think that teaching requires little training. According to this belief, anyone who has the content knowledge would be able to teach. These are misconceptions. As Darling-Hammond (2006) indicated, teachers have a list of things they should know and should be able to do, including knowing how people learn, teaching effectively, meeting individual learner's needs, communicating and managing their classrooms well, and the like. One of the competencies, teaching effectively, often contributes to students' learning (Darling-Hammond, 2006). Especially in the digital era, teaching effectively requires more than content knowledge. To teach effectively, one needs knowledge of content, pedagogy, and technology integration, and the in-

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terplay of these three bodies of knowledge known as technological pedagogical content knowledge (TPCK) (Mishra & Koehler, 2006).

Mishra and Koehler (2006) defined technological pedagogical content knowledge:

This knowledge is different from knowledge of a disciplinary or technology expert and also from the general pedagogical knowledge shared by teachers across disciplines. TPCK is the basis of good teaching with technology and requires un understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones. (Mishra & Koehler, 2006, p. 1028-1029).

Teacher education programs usually provide pre-service teachers with separate courses in which content, pedagogy, and technology literacy skills are introduced to learners. The interplay between the three components tends to be neglected. This chapter is not about developing technology nor content knowledge, but rather about solidifying technological pedagogical content knowledge by using blogs to meet the tremendous academic needs of teacher education in ways that have never before been available. The final goal of this chapter is to identify the importance of blog technology for pre-service teacher education.

BACKGROUND

The use of Internet technologies has been changing human interaction, communication, and relationships. By including Internet technologies in education, the technology revolution makes the learning environment diverse and complicated, and the role of teachers in students' learning is transformed into facilitating. Can teacher education keep updated with these changes and meet pre-service teachers' needs for their future teaching careers? The answer is far from certain, because the new skill sets required by the new century classrooms differ from skills developed by current teacher educators. The 21st century students are growing up in the time when Internet access has become widespread. Youngsters send/receive e-mails, use instant messaging, search for information online, play online games, and make online friends. Widespread access to information and resources is bringing young people the pros and cons of the digital age. To deal with the complexity of this environment, students need up-to-date skills to compete in the 21st century working environment. According to the report *enGauge 21st Century Skills: Literacy in the Digital Age* (2003) by the North Central Regional Educational Laboratory (NCREL), four groups of skills analyzed through literature reviews, surveys and interviews, represent the 21st century skills needed by students, citizens, and workers in the Digital Age. The skills are 1). Digital-age literacy: including basic, scientific, economic, and technological literacy, visual and information literacy, and multicultural literacy and global awareness, 2). Inventive thinking: including adaptability and managing complexity, self-direction, curiosity, creativity, and risk taking, and higher-order thinking and sound reasoning, 3). Effective communication: teamwork, collaboration, and interpersonal skills, personal, social, and civic responsibility, and interactive communication, and 4). High productivity: prioritizing, planning, and managing for results, effective use of real-world tools, and ability to produce relevant, high-quality products. In the 21st century, we will need to go beyond textbooks and define literacy to include the ability to exercise thinking skills and to utilize Internet technologies.

While standards for learning and demands on teachers have been increasing, there are changed expectations for teachers and growing concerns

about teacher educators. Research studies evidenced that teachers' school experience influenced their belief about teaching and influenced the way they teach (Carter & Doyle, 1996). How teacher educators teach pre-service teachers significantly influences the way pre-service teachers teach. Most of the current teacher educators were educated at the time when Internet access was not available or rarely available, and the information-communication technologies (ICT) were not as user-friendly as they are now. Presently, teacher educators lack sufficient knowledge of the value of the current technologies and hardly think of innovating teaching through the technologies. Teacher educators may continue to educate their students, namely, pre-service teachers, in the way they themselves were educated. Pre-service teachers may either imitate the way their teacher educators taught or adopt their intuition to teach (Gardner & Williamson, 2007). These outdated ways may directly or indirectly result in the inability of pre-service teachers to thrive as teachers. To equip young teachers with 21st century skills, teacher educators have to reshape teaching and learning using technology.

The Blog Technology

Internet technologies and software applications have become more intuitive, and computer technologies and Internet communication tools are being applied to the education field and integrated into classrooms. One of these tools is the weblog (often called blog), which is emerging rapidly in the context of education, providing an uncomplicated but powerful organizational form supporting online expression (Oravec, 2002). Especially during the last few years, blogging has become a popular online activity across all ages, races, and countries. Many people either blog or read blogs every day. Blogging is a method of journal keeping, except that blogging can share and disseminate information and emotions around the world. In the blog environment, people ask questions, think about thinking (meta-cognition), and write to the public. The environment is culturally rich and educational. Because of its educational value, blogs deserve a high profile in teacher education.

Essentially, blogs are a reflective tool. When people blog, they reflect, and express thoughts through writing. Blog technology provides a premium platform for reflection. Usually bloggers *turn to prior experience*, *attend to their feelings and emotions*, and *re-evaluate their experience*; these three components are exactly what Boud, Keogh, and Walker (1985) once defined as reflection. Schon (1987) distinguished between *reflection on action* (reflection after practice has been completed) and *reflection in action* (thinking that takes place during practice). This distinction highlights the fact that there are cycles to thought, and their links, and their impacts on practice. Boud, et al. (1985) pointed out, "Reflection does not have to be a solitary activity" (p. 16). People can keep blogs in the form of groups and/or keep their own blogs. If blogging in groups, pre-service teachers can collaborate with their peers and get familiar with the ethics of working in groups. Through collaboration, pre-service teachers experience the process of knowledge construction in groups and develop collaboration and interpersonal skills. After all, schools often need teachers to work together to accomplish projects. Therefore, it is essential to develop pre-service teachers' effective communication skills during the period of teacher preparation. Another reason why blogs are recommended in teacher education is that blogs can help pre-service teachers become aware. Most learners are not aware of how they construct or attribute meanings to what they see. Learners often do things habitually. Learners can become prisoners of rigid competencies (Candy, Harri-Augstein, & Thomas, 1985). Blogging can help pre-service teachers get out of the shackle of habit and develop reflective practice in teaching.

In addition to facilitating the skill development of higher-order thinking, keeping blogs can help pre-service teachers cultivate technology literacy.

For the last five years, information-communication technology (ICT) has become more and more used as a tool to enhance the delivery of curriculum and instruction. Blogs, a type of Web 2.0 technology, can be regarded as information-communication technology (ICT). When blogging is integrated into teacher education, pre-service teachers can observe teacher educators modeling technology integration in an instructional setting. Pre-service teachers get familiar with the virtual learning environment, and are indirectly enabled, equipped with the pedagogical knowledge, technical skills and interplays required for their future teaching.

Taking advantage of their accessibility and the potential for accountability, blogs can be utilized as e-portfolios. Blogs record both the process and products of learning. Blog portfolios can encourage pre-service teachers to think creatively while considering what content to collect and how to use media to display their content. There have been numerous research studies investigating the significant relationships of individual differences and media modes (eg, Ford, 1985; Ford & Chen, 2001; Jonassen & Grabowski, 1993; Liu & Reed, 1994). Diverse media, including text and non-text, can complement individual differences in learning and can be easily placed in blogs to communicate pre-service teachers' thoughts, display their artifacts, and demonstrate learning outcomes.

Furthermore, the process of blogging helps to develop pre-service teachers' meta-cognitive skills, further generating educational value. To blog well, pre-service teachers monitor their own learning and learn when to ask for help or search for additional information. This type of meta-cognition, thinking about one's own thoughts, can empower pre-service teachers to learn independently and help them become lifelong learners (Bransford, Brown, & Cocking, 2002). Once developing meta-cognition becomes a reality for pre-service teachers, then expecting K-12 students to be equipped with 21st century skills will be more realistic.

How to Integrate Blogs in Teacher Education

All over the world, we hear cries for the improvement of teacher education. If pre-service teachers get accustomed to recording their own performance through portfolios as early as when they are in teacher education programs, they may be less resistant to evaluation when they start their teaching profession. Thanks to the transparency of blog technology, there is little technical barrier to keeping a blog portfolio. Making blogs is as easy as writing e-mails. Training pre-service teachers to keep their blog portfolios not only prepares them for evaluation but also encourages them to reflect on their own work while promoting their technology literacy. The merits of blogs in education are multi-dimensional.

This section will describe how blogs can be integrated into teacher education programs. The process of teacher preparation is divided into two parts: course-work period and teaching practicum (including a practicum with and without direct supervision). It is crucial that teaching practice is supported by a theoretical foundation (Grossman, 1990). This chapter applies Cognitive Apprenticeship (Collins, Brown, Newman, 1989) to the context of the teacher education programs. Cognitive Apprenticeship is an instructional model in which teachers try to make thinking visible. The model combines elements of apprenticeship and schooling. To transition from a traditional apprenticeship to a cognitive apprenticeship approach, teachers should conduct the following tasks. 1). Identify the task process and make it visible to students. 2). Situate abstract tasks in authentic contexts, so that students understand the relevance of the task. 3). Adjust the diversity of situations and articulate the commonality of tasks, helping students' transition from what they know to brave the new and unknown (Collins, Brown, Newman, 1991). Cognitive Apprenticeship (Collins, et al., 1989, 1991) identifies five approaches to making the blog-integrated activity an integral

aspect of instruction. They are *modeling*, *coaching*, *articulation*, *reflection*, and *exploration*. Details are as follows.

During the first two years of pre-service teacher training, teacher educators should *model* innovative use of technology in their classroom. During that time, teacher educators should create opportunities for pre-service teachers to experience and observe innovative uses of blogs. Teacher educators should make their own teaching journals available in a blog, and demonstrate how to make teaching portfolios. This makes the process of teacher preparation active and develops pre-service teachers' pedagogical literacy. Teaching portfolios should include everything from how to set up a classroom, to how to deal with unexpected behaviors of students. In that way, pre-service teachers can observe and build a conceptual model of the processes that are required to design, develop, and teach a course; they will be better able to solve classroom problems and reflect on their teaching practice. While observing modeling, pre-service teachers can start building their own portfolios by placing their artifacts in their own blogs. Teacher educators will *coach* pre-service teachers by observing pre-service reflection through blogs. During coaching, teacher educators should offer hints, feedback, reminders, and assistance. They should offer these types of scaffolding, while giving the reins to pre-service teachers. Moreover, teacher educators need to clearly convey their expectations as pre-service teachers may want to work hard to meet the requirements of quality work. (Gathercoal, Crowe, Karayan, McCambridge, Maliski, Love, & McKean, 2007).

After pre-service teachers finish their course work and begin their teaching practicum, they can continue to blog, either in groups or individually. When blogging, pre-service teachers are required to *articulate* their thoughts, *reflect* on their reasoning processes, explain or compare their own problem-solving processes with those of an expert or another participant from their practicum. And it is crucial to require pre-service teachers to *explore* how to frame questions and problems (Collins, et al., 1989). Pre-service teachers should be assigned groups, where they can post questions and problems, respond to each other, collaborate and reflect together on their approaches to teaching and learning in their practicum. Pre-service teachers may sometimes get static with their blogging. Teacher educators need to regularly log in to their students' blog sites to provide feedback to group and individual blogs, and initiate discussions. In addition to functioning as a e-portfolio and reflective tool, blogs can be used as another form of class interaction. Through Cognitive Apprenticeship, the course work combined with blog integration, can address the theory-practice divide. And a teaching practicum based on the innovative use of technology will maximize the benefits of the students' in-school field experience. In the process of blogging, pre-service teachers create their own e-portfolios, observe how teacher educators respond and moderate the asynchronous online discussion, learn to reflect on their own practice, and get familiar with the Web 2.0 technology.

Google offers a free blog site "Blogger." Without any technical threshold, users do not need any special skills, teacher educators can go to http://www.blogger.com to apply for a free account. Then pre-service teachers can open their own accounts. Teacher educators maintain the class blog site for class discussion. Teacher educators can post diverse types of media (text, graphics, photos, video, MP3 and other media) as course supplementation. In addition, teacher educators should require pre-service teachers to post reflections on course content, express emotions and ideas that differ from in-class discussions by being more personal. Teacher educators do not need to restrict pre-service teachers about which part of the curriculum content to explore, and should model the way to reflect on the learning experience. The product, a blog, will give pre-service teachers a sense of ownership of their explorations.

When pre-service teachers post reflections on course content and their prior experiences, they are practicing higher-order thinking skills and making deeper connections to the material. For some people, learning is often dull. With blogs, learning becomes reflective and personal. And learning is supposed to be personal, since one has multiple intelligences, as Gardner (1993) advocates. Maintaining blogs in class activities, pre-service teachers actively participate in thinking and knowledge construction. Therefore, teacher educators should encourage pre-service teachers to explore the curriculum content, that way pre-service teachers have abundant choice to decide what to reflect on and how to reflect. By creating blogs, pre-service teachers learn autonomy, and develop into self-directed learners.

Findings

There have been research studies indicating the importance of opportunities for pre-service teachers to share reflection with each other in an environment of trust and respect (Gardner & Williamson, 2007). Creating opportunities for teacher educators to model innovative use of technology and reflection of their pedagogy to pre-service teachers is a necessity in today's teacher education programs. Based on the guidelines for implementation suggested in the previous section, a teacher education course, *Principles of Instruction* was integrated with blogs as a class assignment. The participants were 155 pre-service teachers in a national Taiwan university during the spring of 2006. The course was integrated with blogs throughout the semester. The course blog was located at http://spring06p1.blogspot.com/.

The students were heterogeneous, sophomores to seniors, from a variety of disciplines. The course was a requirement for all pre-service teachers. Surveys and interviews were used for the investigation of the participants' attitudes toward blogs. Overall, the participants' positive attitudes toward blogs were above-average. The descriptive data of a few sample questions on attitude toward blogs are provided in the following paragraphs. More than 70% of participants agreed or strongly agreed that writing blogs helped them reflect on the course, and around 7% of participants disagreed or strongly disagreed with the statement. More details are displayed in Figure 1.

More than 75% of participants agreed or strongly agreed that writing blogs helped participants exchange ideas and thoughts with their fellows, and less than 10% of participants disagreed or strongly disagreed the statement. See Figure 2.

More than 80% of participants agreed or strongly agreed that writing blogs helped participants express emotions, and less than 6% of participants disagreed or strongly disagreed with the statement. More details are in Figure 3.

Regarding the question: *How did writing blogs about the class help you learn the course content*, there are several types of learning that occurred during the course. Details analyzed from interviews are illustrated in Table 1.

The participants reported several types of feelings emerging when they read their fellows' blogs. Details of feelings brought up are in Table 2.

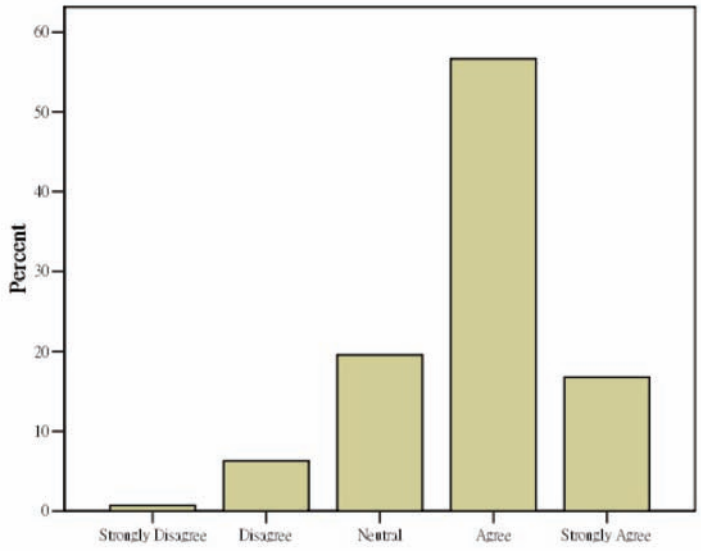
The participants disclosed they experienced significant emotional response when they read their own blogs. Details of feelings for reading their own blogs are in Table 2.

Implications

The findings demonstrated the pre-service teachers' attitude towards blogs and the potential educational values of blogs. The evidence showed that pre-service teachers can use blogs to learn course content, to foster reflection, to monitor and assess their learning process. These are the basic elements of the required 21st century skills (NCREL, 2003; Partnership for 21st Century Skills, 2007).

Reflection in teacher education is not a new concept, but using blogs to facilitate reflection is a new area of inquiry that deserves deep exploration. Based on these research findings of blog

Figure 1. The distribution of participant agreement on the statement Writing blogs helped me reflect on the course contents.



integration in a teacher education course, there are a few qualitative implications to address. First, group blogs and individual blogs function in different ways and should exist together in a learning community. Group blogs provide participants with a platform for interaction, communication, and discussion, and individual blogs provide participants with personal space to keep learning notes, record learning progress, reflect thoughts and actions, and make personal

Figure 2. The distribution of participant agreement on the statement Writing blogs helped me exchange ideas and thoughts with fellows.

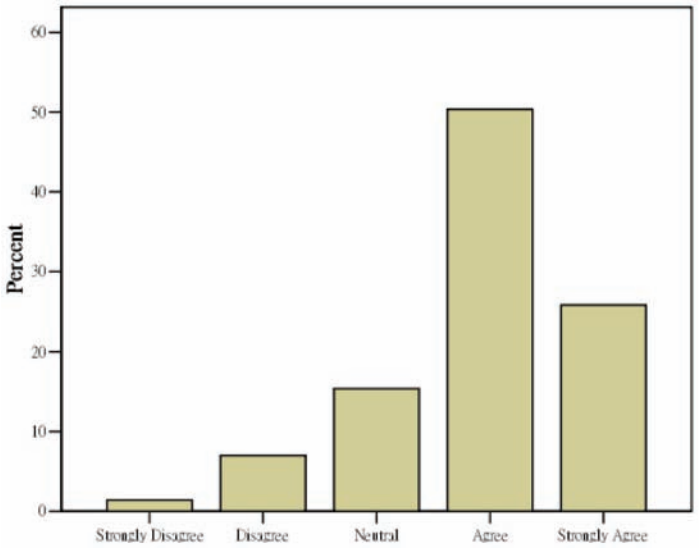
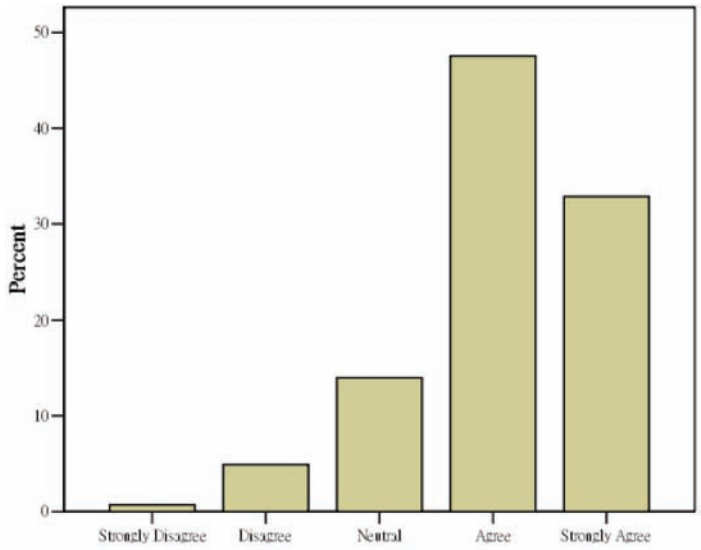


Figure 3. The Distribution of participant agreement on the statement Writing blogs helped me express emotions.



e-portfolios. Through group blogging, pre-service teachers learned that collaborative interaction can create a positive learning experience, and they took the opportunity to share problems, and to

Table 1. How many types of learning took place in the learning context.

Type of learning	Participant Response
Attentive	*"Writing blogs after class made me have to review and digest course content, and forced me to pay more attention to what the instructor said in class."* *"I have no idea what to write in blogs. But if I pay attention to the lectures, I get more inspiration of what to blog about."*
Reflective	*"Writing blogs helps me be aware of how much I learned in class."* *"Before going online, I need to make sure if my understanding of the course contents is correct. I usually evaluate it by reading the textbook again or reading others' blogs."* *"Blogging made me think more logically. Because before I blogged, I needed to think it through and make sure I didn't write something which I would feel ashamed with."*
Meta-cognitive	*"I often needed to evaluate and think about my own thoughts before writing blogs. Blogging made me do a lot of thinking."* *"Each week after class, I wrote blogs, and blogs became a tool for me to understand my learning progress. I can more regulate my own learning."*
Communicative	*"Writing blogs creates opportunity for me to exchange ideas with fellows."* *"Conversing" with fellows through blogs stimulates my thoughts and makes me feel a member of a learning community."*
Connective	*"Writing blogs reminds me of the theories I learned in class and connects with my learning experience."*
Digital literacy	*"The blog activity forced me to learn how to use blogs. At first I felt resistant to learning the tool. After using blogs, I'm glad I got chance exploring the tool. It's cool."*
Collective	*"Our personal blogs keep our own work" very well. When I had exams, the blogs collected my review notes so well that my life got much easier.*
Resourceful	*"There was a lot of useful information on other people's blogs. Sometimes I can find a lot of goodies there. For example, web site links to YouTube videos or to podcasts."*

Table 2. Feelings brought up when participants read other fellows' blogs.

Feelings	Participant Response
Interest	*"I was impressed with some other fellows' opinions. They looked at the things in the way I never thought of."* *"Reading others' blogs is like listening to people singing the same song; you got different interpretation of the song."* *"When I read different thoughts expressed in blogs, I feel they broadened my views."*
Competition	*"I'd like to read other people's blogs and contrast my opinions with theirs."* *"When I read blogs that are written well, I anticipate some day I could reach the level."*
Relaxation	*"When I read someone has the same opinions with me, I feel good about that."* *"I'd like we shared thoughts with each other. Sharing makes me feel relaxed".*
Lurking	*"Reading other people's blogs let me understand them more. I feel I am peeking their privacy."*
Unpleasant feelings	*"I feel pressured when I read blogs written with good insights and analyses. It makes me feel uncomfortable."* *"I'm disgusted with some people who just copied the words from textbook. It wasted my time to read their blogs."* *"Some blog web sites with messy interface pissed me off!"*

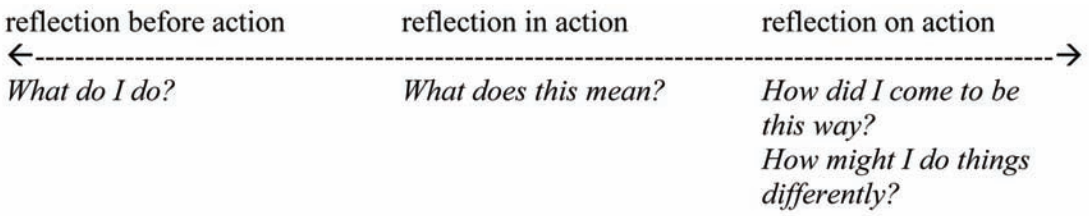
offer suggestions or support each other. In the process of blogging, pre-service teachers addressed each other's concerns, and learned to search for solutions collaboratively, different perspectives were shared and ideas sparkled, resulting in more positive attitudes toward learning and teaching. Through individual blogging, pre-service teachers learned to reflect and construct their knowledge of teaching, become more aware of their thoughts and action, and make their e-portfolios for future career.

Second, participants need scaffolding for reflection. Atkins and Murphy (1993) indicated that the following components are necessary for reflection: self-awareness, description, critical analysis, synthesis, and evaluation. And Paterson (1995) indicated the following factors affect reflection: 1) developmental levels of reflection; 2) perception of trustworthiness of the teacher; 3) clarity of expectations related to journal writing tasks; 4) quantity and quality of teacher feedback. Teacher educators need to recognize these factors and support pre-service teachers' progression through those different skills of reflection. Starting with personal performance at a practical level, pre-service teachers learn to justify their teach-

Table 3. Feelings when participants read their own blogs.

Emotions	Participant Response
Motivation	*"When I read my own blogs, I felt impressed with my work. Those blogs were written week by week and accumulated to such amount. I felt I learned something. I got great sense of achievement!"* *"Reading my own blogs helped me monitor my own learning progress and motivated me to write more."* *"I felt proud of myself that I can express myself."*
Self-criticism	*"Sometimes I felt stupid with my words. I wished I had not written such stupid ideas."* *"Sometimes when I read blogs, I felt I was making progress, because they were thought-provoking. But sometimes my thoughts were empty and full of ignorance."*
Pleasant	*"I felt great that I can express my emotions freely."* *"It's pleasant I can recall what happened in class by reading blogs."*
Expectations	*"I looked forward to people's responding to my ideas or discussing with me."* *"I'd like to get more feedback from my teacher."*
Critical of the process or of others	*"I felt childish with blogs. Blogging is like keeping a diary; a diary is supposed to be private."* *"People were so superficial in blogs, showing off ideas or stuff. I'm not going to play the stupid game."*

Figure 4. Questions to stimulate reflection in the blog context.



ing practice, and finally to reflect on values and thought-provoking issues (Furlong, 2000).

If necessary, teacher educators can post topics or raise questions, to stimulate pre-service teachers' thinking. Questions can be used as prompts. This chapter suggests a framework for reflection and prompts. Prompts vary, depending on the time frame of the learning context. Schon (1987) distinguished the time frame of occurrence of reflection, as mentioned earlier. Postholm (2008) added another segment, reflection before action, thinking about prior experiences and theories before taking action. Reflection before action, reflection in action, and reflection on action constitute the complete process of reflection. Regarding what questions to ask during reflection, Smyth (1989) suggested four questions that can stimulate reflection: What do I do? What does this mean? How did I come to be this way? How might I do things differently? With the four stimulating questions, a framework of reflection and questions to guide reflection in learning contexts is recommended in Figure 4. Notice that asking open-ended questions rather than closed ones is a must.

Third, to build a successful blogging community, teacher educators need to participate in the blogs. The participants in this study emphasized that they looked forward to feedback from their instructor and peers. To meet the need, teacher educators should join blog reflection on a regular basis and leave comments on pre-service teachers' blogs. On the other hand, teacher educators can diversify feedback by assigning pre-service teachers into groups and requiring them to reply to each other. By doing so, pre-service teachers can acquire feedback from their peers and a learning community is gradually built up. Considering the limited time teacher educators can commit to a class, it is necessary to make effective use of the learning community and re-direct learners' reliance on the instructor to the learning community. But the instructor must be a part of the community! To encourage active participation in the blog community, teacher educators need to take responsibility for moderating online discussions.

Salmon developed a five-stage framework for moderating groups and suggestions for consideration (Salmon, 2000). Contextualized in the blog environment, the five stages of moderation are: 1) Stage of access and motivation: Teacher educators post welcoming and encouraging blogs to invite pre-service teachers to join the blogging; and construct the atmosphere in which pre-service teachers feel secure and can talk openly and honestly about their feelings. 2). Stage of socialization: Teacher educators introduce themselves to the class, demonstrate respect for differences among class members, and bridge differences of opinion in a non-judgmental manner. 3). Stage of information exchange: Teacher educators encourage pre-service teachers to share information and learning materials by, for example, providing web site links on blogs. 4). Stage of knowledge construction: When blogging, pre-service teachers post reflection on course content or post questions they have. Teacher educators participate in online discussions with pre-service teachers and facilitate the process of knowledge construction.

For teacher educators, the priority is to maintain a flexible environment for knowledge construction. 5). Development: It is at this stage that teacher educators respond to questions and monitor the discussion process. As pre-service teachers reflect on their experiences in schools and their learning, it is necessary to interrogate, test, and challenge pre-service teachers' experiences to avoid unconscious assumptions, because assumptions may reduce creativity in trying to understand or resolve a problem. Incidentally, teacher educators should always take pre-service teachers' learning styles into consideration to handle ideas or thoughts in blogs (Salmon, 2002).

Finally, the quality of the blogs will influence their effect. Some participants complained when they saw fellows not reflecting their thoughts but only copying the words from textbooks, they felt that reading the blogs was wasting their time. In light of the problem, it is essential that teacher educators emphasize and evaluate the quality of blog contents. Blogs provide users with an interactive platform for reflection. Thus, to evaluate blogs, reflection is a key. There are several frameworks for evaluating reflection (Boud, et al., 1985; LaBoskey, 1993; Sparks-Langer, Simmons, Pasch, Colton, & Starko, 1991; Valli, 1990). For example, Boud et al. (1985) categorized critical analysis into four elements: association (connecting new data with what is already known), integration (searching for relationships among data), validation (determining the authenticity of ideas, feelings and emotions that have resulted), and appropriation (making knowledge one's own). Regarding how to evaluate reflection, Zeichner and Liston (1987) designed the Reflective Index to identify student teachers' reflection in meetings with their supervisor. The Reflective Index consists of four categories ranked from lowest to highest in importance. The four levels can be used to measure the reflection that occurs in a blog context. Details are explained with examples as follows.

1. Factual level: When blogging, pre-service teachers recall some students' behavior that occurred in classrooms; the reflection is at the factual level.
2. Prudential level: When blogging, pre-service teachers evaluate the effectiveness of conducting objective assessments or e-portfolios; the reflection is at the prudential level.
3. Justificatory level: When blogging, pre-service teachers focus on the reasons why collaborative learning activities occurred, or why some individual learning activities are suitable; the reflection is at the justificatory level.
4. Critical level: When blogging, pre-service teachers explore teacher educators' perception that underlies the reasons why teacher educators integrate blogs in the learning process; the reflection is at the critical level.

CONCLUSION

This chapter suggested the implementation how-to and rubrics for assessing reflection in an online blogging environment. To successfully implement blogs in teacher education, the administrative authorities in teacher education programs may have to require that teacher educators implement blogs throughout the period of teacher preparation and provide professional development for teacher educators whenever necessary. Requiring teacher educators to use blogs creates opportunities for pre-service teachers to update their technology literacy, to make personal e-portfolios by collecting artifacts from different courses into blogs, and to prepare for carrying out reflective practice in their future careers teaching in K-12 settings.

Effective technology integration in classrooms does not require expensive hardware and software. People tend to have the misconception that adopting technology integration in schools needs to be expensive. Quite a few web sites provide blog services for free. Teacher educators should learn

how to make good use of free online resources and model the practice to pre-service teachers. After all, not all pre-service teachers can teach at schools with sufficient funding. Finally, teacher educators can take Cognitive Apprenticeship as the approach to develop pre-service teachers' pedagogical literacy and reflective practice. This instructional model combines aspects of traditional apprenticeship with formal schooling. Following the principles of Cognitive Apprenticeship, teacher educators will be able to help pre-service teachers develop higher-level skills, such as decision making and problem solving in classrooms.

During the last decade, while new Internet technologies have been continuously emerging, the popular blog technology has made a significant impact on the dissemination of information and knowledge. Blogs are "transforming publishing and traditional media into more personal and interactive experiences" in which users become active participants, not just passive consumers (Kennedy, 2004, p, 249). Recognizing the potential and popularity of blogs in education, teacher educators in teacher education programs must update their traditional educational practice and connect theory with practice to help would-be teachers gain sufficient competence and confidence to thrive in the 21st century classrooms.

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Chapter 14
Facebook as Public Pedagogy:
A Critical Examination of Learning, Community, and Consumption

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ABSTRACT

This chapter explores the emergence of online digital media, specifically Facebook, as a space of resistance and submission to consumerist ideologies. Online digital media function as a form of public pedagogy, serving as a platform for implicit lessons in cultural norms and roles that reinforce hegemonic social structures operating in the physical world. In this chapter, we raise issues and questions regarding the determinacy of online digital media: is Facebook a pedagogical tool for reinforcing corporate interests or does it have the potential to be a space of resistance and democratic discourse? The study of the public pedagogy of online digital media calls for a reconceptualization of learning as a collaborative, social process in which adult learners assume predetermined social roles as well as have the potential to create new knowledge forms within virtual communities.

INTRODUCTION

The introduction and mass consumption of technological media and online networks has interrupted long-held conceptions of learning and knowledge. In today's globally networked world, knowledge is continuously produced in interactions across online global networks (Castells, 1996; Farrell, 2004; Gee et al., 1996). Online networks are spaces where learning and knowledge production rely on social engagement (Stiles, 2000). In the social process of learning, "we make and use knowledge together, with other people" (Farrell, 2004, p. 481). Scholarship on online networked knowledge production suggests that technological media has the potential to both resist hegemonic practices and surrender to corporate motives (Farrell, 2004; Giroux, 2004).

Many of today's adult learners, especially those emerging from Generations X and Y, experience learning within formal educational spaces as decontextualized, irrelevant, and generally focused on hierarchical relationships between teacher and

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students. This is not to say adult learners are not learning, however; they are, but not in traditional ways or traditional places. Adult learners are spending more time engaged in various forms of informal and self-directed learning outside of formal classroom settings, and are increasingly interacting with the vast media-facilitated "public pedagogy" (Giroux, 2000) of popular culture (Tisdell, 2008).

Educators interested in the dynamics of public pedagogy have investigated cultural spaces and practices such as "television, movies, video games, music, Internet, instant messaging, iPods, shopping malls, theme parks, etc" (Kincheloe, 2007, p. 31) as forms of public pedagogy. Researchers within the field of adult education, more specifically, have researched various sites of popular culture and everyday life as spaces and activities that educate adults in informal and incidental ways. Adult education researchers have focused on fiction novels (Jubas 2007); non-fiction products such as radio, newspapers, magazines, and television histories (Armstrong & Coles, 2008; Sandlin, 2005a; 2005b); fashion (Stalker, 2004); video games and virtual communities on the internet (Grace, 2004; Hayes, 2006; Hollenbeck, 2005; Thompson, 2007); and movies, television programs, and cartoons (Armstrong, 2005a, 2005b).

Because many of these sites of public pedagogy are embedded in a rapidly expanding consumer culture, adult educators have also recently become interested in examining the adult learning involved in consumption and its resistance (Jarvis, 2008; Jubas, 2008; Ritchey, 2008; Sandlin, 2008; Usher, 2008; Usher, Bryant, and Johnston, 1997). We posit that adult educators need to continue to focus attention on issues of consumerism and its resistance, given the increasing role consumption plays in structuring every aspect of our lives (Bocock, 1993). One public pedagogical space that is embedded in consumer culture and where adult learners pursuing higher education are increasingly spending their time, consists of online networks and social networking sites. One in particular, Facebook, is especially popular (Bugeja, 2006; Eberhardt, 2007; Higher Education Research Institute 2008; Towner & Van Horn, 2007; Wesch, 2007).

Educators examining public pedagogy have focused on how these spaces reproduce hegemony and instill dominant cultural values in individuals. Giroux (1999) states such cultural spaces have become primary educational forces in "regulating the meanings, values, and tastes that set the norms that offer up and legitimate particular subject positions—what it means to claim an identity as a male, female, white, black, citizen, noncitizen" (pp. 2-3). We posit that, along with learning about issues of identity and subject positionality, learners engaging in spaces of public pedagogy, and particularly in online social networking sites such as Facebook, also engage with various conceptions of what it means to be a "learner," a "community member," a "consumer," and a "citizen."

In this chapter we raise issues and address broad questions about learning, community, and commodification in Facebook. Specifically, we ask: What does learning look like in an unbounded, unbundled, open source space that is concurrently also a space of commodification and consumption? How do online social networks like Facebook create communities of learners as users navigate and negotiate the terrain between commodification and freedom? And, how does participation in this educative space shape learners' notions of community? The complex interplay of power, resistance, knowledge forms, and identity, along with an emerging reconceptualization of community make sites like Facebook ideal spaces for analyzing adult learning in digitally networked spaces of public pedagogy. We begin by exploring learning in Facebook from the lens of learning as a social process. Then, we attempt to make sense of the ways in which Facebook users are reconceptualizing "community" through digital, social learning experiences. Finally, we discuss the ways in which Facebook is a space of commodifica-

tion, espousing opportunities for unprecedented freedom of shared information while at the same time also serving consumerist ideologies.

BACKGROUND: LEARNING IN FACEBOOK

Facebook was created in 2004 by Harvard student Mark Zuckerberg as a way for college students at his university to connect online. The platform spread quickly with immense popularity and by August 2008, Facebook had more than 100 million active users worldwide (Facebook, 2008f) generating 65 billion page views each month (Facebook, 2008a). Buoyed by its success among college students, Facebook introduced profiles for commercial organizations. By November 2006, there were almost 22,000 organizations with Facebook page directories (Smith, 2006) comprising nearly half of the 55,000 networks (Facebook, 2008a). At the same time, Facebook networks were used at 2,681 United States colleges (Facebook, 2008b).

Facebook enables users to join networks organized in a vast number of ways (i.e. city, current or former school, workplace, interests). Each user has a personal page where she can list information about herself, including relationship status, educational background, political views, educational level, and favorite books, music, and activities. Users can also upload photos and videos, post links to websites of interest, and add "applications" to their pages; applications are often created not by Facebook, but by "third parties." Applications exist that do a wide variety of tasks ranging from adding a music playlist to one's Facebook profile, to adding a calendar users can use to track how many times a month they attend yoga classes. Other applications consist of games or quizzes; or tools through which friends can send each other virtual gifts, plants, hatching eggs, or drinks. To network with others, users can choose to make "friends" with others on Facebook; to "friend" someone, a user locates a potential friend through various search methods, sends him or her a "friend" request, and waits for that person to "accept" or "reject" their request. Once two people become "friends," they can see each other's profiles, photos, applications, and other friends, provided their privacy settings are set accordingly. Users can also network through joining groups based on mutual interests. Groups exist, for example, that gather individuals into communities based on mutual interests in everything from foods, sports, forms of exercise, movies, music, political parties, activist causes, academic subjects, novels, writers, and celebrities, just to name a few topics. Individuals' Facebook pages typically also have a "wall," which is a space where friends can comment, say hello, or post website links; depending on what level of privacy a person chooses, this wall is available for select friends to view, or available for all visitors to see. Two-thirds of users log into Facebook every day (Cassidy, 2006).

We are currently operating in a Web 2.0 culture, which refers to technology-related software that fosters participation in user-generated virtual applications (Miller, 2005). Web 2.0 is a space where learning is learner-centered and learner-driven. In the context of this new digital era, where information can be accessed and shared with the click of a button, it is no surprise that Facebook has the potential to operate as a space of collaborative and cooperative learning within a community. It is also little surprise that both universities and corporations are embracing and utilizing the popularity of Facebook. With social networking sites like Facebook, organizations have a new platform for communication and collaboration.

For some adult learners, social networking sites have been employed as a pedagogical tool. Scholars have examined how technologically mediated spaces have been used within educational contexts (Bagherian & Thorngate, 2000; Harasim, Hiltz, Teles & Turoff, 1995). Online social networking sites have grown unique virtual

learning communities which are often voluntary, self-organizing groups that work intelligently and efficiently creating new forms of social coordination (Rheingold, 1993; 2002). In her experiences, blogger Melanie1987's (2007) teachers have used sites like Facebook as tools for developing spaces of learning where all learners feel free to contribute to collaboratively and constructively working together. When an anthropology class at Kansas State University posted a document online titled *A vision of college students today*, over 200 learners made 367 edits through a similar, collaborative effort. The collaborative model employed by Facebook allows concurrent input of different agendas, approaches, and priorities. Facebook allows people to share information, knowledge, and experiences. This Web 2.0 software enhances information sharing and collaboration among users, allowing for social networked learning. Facebook thus transgresses the traditional social environment, creating a layered reality where learners interact virtually (Eberhardt, 2007).

Examining the function and pedagogical implications of online technologies, scholars have outlined how corporate media influences the cultural landscape and drives a rhetoric that manipulates how people experience technologically mediated spaces (Elmer, 2004; Luke, 2005; Peters, 1999). Research into the culturally-driven rhetoric of online networks brings to light issues of neoliberalism, capitalism, and the need for democratic discourse (Giroux, 2004; Lessig, 1999, 2001; Luke, 2005; Sunstein, 2001a, 2001b). Scholars have also addressed the panoptic vision of digital networks which mediates online activities (Elmer, 2004; Poster, 1990; Peters, 1999).

Learning in Facebook has also been characterized by *collaboration* because the platform's pedagogy has the potential to engage learners as creators of knowledge and as active participants in the learning process (Eberhardt, 2007; Farrell, 2004; Gee, 2003; Hayes, 2006). In some ways, components of a critical transformational learning that seeks to redefine "transformation" as "something that involves both individual and social change and that takes seriously the social contexts within which learning takes place" (Sandlin & Bey, 2006, p. 49), can operate in Facebook and engage learners to "build new, more democratic cultural realities" (Sandlin & Milam, 2008, p. 330). The collaborative, productive nature of Facebook and its usefulness as a platform for forming networks and sharing critical information on race, class, gender, and a wide variety of social-justice oriented social movements, hold possibilities for critical learning.

While Facebook users can create their own content through blogging or entering information on their walls, Facebook seems especially useful as a space that allows users to quickly and easily disseminate information that was produced or created elsewhere. For instance, Jenny is a subscriber to Joe Feagin's (sociology professor at Texas A&M) weekly racism update, and is also a member of the Facebook group "The Church of Stop Shopping," an anti-consumption social movement group that is led by consumer activist Reverend Billy. These groups distribute important information on racism and social movement action quickly to large numbers of people who are interested in such issues. With Facebook, then, learners are able to share information quickly and easily with large numbers of people, making collaboration across time and space easy. However, Facebook users are also subject to being marketed to by companies in attempts to reproduce existing patterns of hegemony and perpetuate rampant consumerism, which we will discuss more fully below. A critical pedagogical issue concerning Facebook, then, is considering how to push transgressive points without succumbing to total commodification.

The ways people choose to learn and engage with knowledge is woven into a fluid process of change. As Martens (2005) describes today's adult learners, "The contemporary individual is confronted with a plurality of choices, a consequence of the increasing salience of methodological doubt in the project of modernity, the decline of

prescriptive routes for action and multiplication in the life worlds in which individuals move" (p. 345). Facebook reflects this, as its model of collaborative learning operates within a rich comingling of corporate presence and user generated content, and as it fosters new conceptions of community.

ISSUES, CONTROVERSIES, AND PROBLEMS: COMMUNITY IN FACEBOOK

Communities that once grew out of geographical proximity (Aldridge, 2003) gave rise to social conditions revealing the "mutuality of the oppressed" (Williams, 1973, p. 104). That is, communities reinforced the exclusionary nature of power struggles, keeping those with power separate from those without. Meyrowitz (1985) argues that socio-economic and political conditions of the physical world do not bleed into technologically mediated spaces. Essentially, digital worlds "obliterat[e] loyalty to territory, so that we have become hunters and gatherers of an information age, citizens of an essentially placeless culture" (Meyrowitz, 1985, p. 105). Giddens (1990; 1991) explains that *place* has become the illusion of an imaginary space in which "we are uneasily aware that the global has engulfed the local" (Aldridge, 2003, p. 105). The changing notion of *place* is altering how we conceptualize, form, and participate in communities.

Theoretical concepts of community in online social networks describe networked learning as developing out of collaborative group activities (Allan & Lewis, 2006). Networked learning involving collaborative group work in virtual communities emphasizes the social aspects of learning and building knowledge (Allan & Lewis, 2006; Vygotsky, 1978). Learning through community "highlights the importance of discussion and discourse, the creation of shared meanings and the opportunities for reflection with others" (Allan & Lewis, 2006, p. 843).

An emerging conception of community in Facebook recognizes the movement away from the restrictions placed on community by physical space. St. Clair (1998), drawing upon Habermas' (1984) theory of communicative action, explains that the "struggles of subjects to understand and to be understood cannot take place on a universal or individual level. Communication requires a middle level locus to be meaningful, a setting for the interaction to take place" (p. 7). Facebook allows learners to access different kinds of community and enables them to create completely new communities based on shared interests as opposed to kinship or civic responsibility (St. Clair, 1998). Many Facebook users are members of communities that have formed around places, schools, work, movies, and brands. For instance, on Jenny's Facebook page she is a member of 17 different groups, some of which are formed around brands (the Japanese anime movie *My Neighbor Totoro*, her Honda metropolitan scooter), social justice causes (anti-consumption social movement groups), and others around her high school, college, and even her family name (Sandlin). On Ricky's Facebook page you will find he is a member of groups formed around his college, sports interests, and work on comprehensive exams. Aldridge (2003) explains, "The rhetoric of community [in this age of consumerism] is as powerful as ever, as is the yearning for fulfillment in communion with others. We all feel the pull of community. The spirit of our age is democratic, anti-authoritarian and egalitarian, and is in tension with traditional forms of community and schooling, which are essentially hierarchical" (p. 107). Facebook has adapted to contemporary popular culture by enabling the user to be an active, social participant in a wide array of communities formed around shared interest.

As mentioned above, part of the social aspect of community in Facebook is the ability to accumulate and display one's "friends" visibly on each user's page. The number of "friends" one

has on Facebook can be correlated to how large one's personal community is and the number of communities one belongs to. We have overheard learners on our campus comparing the numbers of friends they have on Facebook, and defending the depth of those relationships vehemently. Aldridge (2003), citing Pahl (2000) exhorts that one way to deal with the stresses in our present consumption-driven, risk society is to "form good relationships" (Pahl, 2000, p. 172). Following Pahl (2000), Aldridge (2003) stresses the importance of *friendship*, as he argues that friendship "is well suited to a consumer society, not least because it is rooted in choice and can survive the collapse of community as conventionally understood" (p. 109). Aldridge (2003) further disputes those who state that modern life is "hostile to friendship," arguing that modern life actually helps foster friendship; he cites "telecommunications" as one aspect of modern life that "enable[s] us to keep in touch with friends despite the fact that we are geographically mobile and time-pressured" (p. 109). From this perspective, Facebook could be positioned as an important means to fostering such friendships. However, despite some Facebook users' strong objections to the contrary, there is a valid critique regarding how "deep" one's connection is to their cyber-friends, some of whom a user might never have met face-to-face. Sites like Facebook may actually not increase the value of community in the sense of social bonds and relationships, but rather decrease true, deep friendships, and replace "real" community with a false or superficial sense of community, a point taken up by critics of networked or virtual communities such as Doheny-Farina (1996).

ISSUES, CONTROVERSIES, AND PROBLEMS: COMMERCIALISM AND COMMODIFICATION IN FACEBOOK

At the same time adult learners are investing more and more time and energy into social networking, Facebook is asking those users who also have software development skills to translate new versions—for free (Hosaka, Apr 19, 2008). The concept of collaborative translation is familiar in open-source programming communities. But Facebook *'s* effort, as it launches sites in Japanese, Turkish, Chinese, Portuguese, Swedish, Dutch, Spanish, French and German during 2008, reflects a growing trend which attempts to harness users' energy to do work traditionally conducted by paid professionals. More than 100,000 users have installed Facebook's translation application and nearly 10,000 helped translate the French, Spanish and German sites, the Spanish version in less than four weeks and the German version in two weeks (Hosaka, Apr 19, 2008). A software developer from Turkey posited that getting the opportunity to build translated Facebook versions is good for users, as it engages users themselves in important acts of cultural production: "We come up with the words and phrases that will . . . eventually become a part of the Turkish language itself" (Hosaka, Apr 19, 2008, ¶ 29). However, not everyone agrees that this arrangement is beneficial for users, as there are several group pages on Facebook that criticize Facebook *'s* use of open source programmers as exploiting the labor of the masses.

In order to understand both these praises and these criticisms, it is necessary to situate Facebook within its context as part of the new digital economy, which is an economy characterized "by the emergence of new technologies (computer networks) and new types of workers (the digital artisans)" (Terranova, 2003, ¶ 9). Drawing upon the work of Barbrook (1997), Terranova explains that the digital economy is a mixed economy including at least three elements:

A *public element* (the state's funding of the original research that produced Arpanet, the financial support to academic activities that had a substantial role in shaping the culture of the Internet); a *market-driven element* (a latecomer that tries to appropriate the digital economy by re-introducing commodification); and a *gift economy*

element, the true expression of the cutting edge of capitalist production that prepares its eventual overcoming into a future anarcho-communism. (¶ 10, emphasis ours)

Within this new digital economy, individuals increasingly perform what Lazzarato (1996) conceptualizes as "immaterial labor," which refers to two different aspects of labor:

On the one hand, as regards the "informational content" of the commodity, it refers directly to the changes taking place in workers' labor processes . . . where the skills involved in direct labor are increasingly skills involving cybernetics and computer control (and horizontal and vertical communication). On the other hand, as regards the activity that produces the "cultural content" of the commodity, immaterial labor involves a series of activities that are not normally recognized as "work" – in other words, the kinds of activities involved in defining and fixing cultural and artistic standards, fashions, tastes, consumer norms, and, more strategically, public opinion. (Lazzarato, 1996, p. 133)

Terranova (2003) further explains that immaterial labor on the Internet consists of work such as "writing/reading/managing and participating in mailing lists/Web sites/chatlines" (¶ 31). Thus, Facebook-users-turned-software-producers can be seen as engaging in immaterial labor as they create both technical and cultural knowledge.

Those who applaud Facebook*'s* open source plan echo cyberlibertarians such as Kelly (1994), who uncritically praise the creative and democratic possibilities of the "collective nature of networked, immaterial labor" (Terranova, 2003, ¶ 33), arguing that "computers and computer networks are sites that enable the emergence of a collective intelligence" (Terranova, 2003, ¶ 33). This perspective focuses on the "gift economy element" of the digital economy. Others focus on the market-driven element of the digital economy, and argue that workers who provide uncompensated immaterial labor are being exploited because their labor increases the market and economic value of particular goods and services, but they are not being compensated for this labor (Arvidsson, 2005). However, others like Terranova (2003) are more ambivalent, arguing that we need to move past viewing the Internet in binary terms, as either "capital" or "anticapital" (¶ 71) and that we need to not only "demystify the Internet as the latest capitalist machination against labor" (¶ 72), but also to come to a more complex understanding of how labor, politics, and culture interact. Terranova (2003) positions the work of volunteers such as those who write code for Facebook as "free labor," and posits this free labor as "simultaneously voluntarily given and unwaged, enjoyed and exploited," (¶ 3) as she argues that "the Internet is always *and* simultaneously a gift economy and an advanced capitalist economy" (¶ 62). Volunteers who provide uncompensated immaterial labor do so for many reasons, not the least of which is the "historically rooted cultural and affective desire for creative production" (¶ 11). She further explains that such volunteers are:

Not working only because capital wants them to; they are acting out of a desire for affective and cultural production that is nonetheless real just because it is socially shaped. The cultural, technical and creative work that supports the digital economy has been made possible by the development of capital beyond the early industrial and Fordist modes of production and therefore is particularly abundant in those areas where post-Fordism has been at work for a few decades. . . Free labor is the moment where this knowledgeable consumption of culture is translated into productive activities that are pleasurably embraced and at the same time often shamelessly exploited. (¶ 12)

Another example of the complicated nature of the digital economy and the contested nature of the cultural space of the Internet is the recent push of advertising and commodification into Facebook. Facebook released a suite of advertising tools in late 2007, including "Facebook Pages," "Beacon," and "Social Ads." In addition, Facebook created new ways for businesses and other advertisers to

collect data on who is visiting their Facebook sites or engaging with their advertisements ("Insights"), and to collect information about current or future customers through virtual polls and questionnaires ("Polls"). These new tools are explained to current and future advertisers in a section of Facebook created specifically for them (http://www.new.facebook.com/ads/?ref=pf).

Taken together, these new marketing tools exploit a new "pull marketing" era in which consumers voluntarily endorse brands and products they like, and in which marketers can marry advertisement messages to user-initiated endorsements of products or services (Klaassen, 2007). One step of this new style of marketing involves user-initiated recommendations of a brand. "Facebook Pages," for instance, allow organizations to establish an "interactive presence" (Facebook, 2008c) on Facebook; Facebook markets this opportunity to businesses and services such as restaurants, bars, cafes, health and beauty, attractions, sports teams, artists, and politicians. As of July, 2008, there were over 150,000 such business pages on Facebook (McKeefery, 2008); a quick browse we conducted revealed pages for Barack Obama, Pringles, Adidas, Starbucks, Pirates of the Caribbean, Playboy, Transformers, Lego, Dunkin Donuts, MTV, Marmite, Victoria's Secret, and the NBA. Facebook markets this service to potential advertisers by stressing the ways in which "Facebook Pages" allow users to form personal relationships with brands:

Every Facebook Page is a unique experience where users can become more deeply connected with your business or brand. Users can express their support by adding themselves as a fan, writing on your Wall, uploading photos, and joining other fans in discussion groups. You can send updates to your fans regularly — or just with special news or offers. Add applications to your Page and engage your users with videos, reviews, flash content, and more. Creating a Facebook Page is easy, free, and great for all types of businesses. (Facebook, 2008c)

Once a business has established a Facebook presence, Facebook users can visit those pages and can choose to express their interest in that brand by becoming a "fan" or by writing on the brand's Facebook "wall." When users perform such actions, they are announced on that user's own Facebook page, and also to that user's friends via a newsfeed.

"Beacon" works in a similar way, except that it focuses on user activity outside of the Facebook platform. Businesses can incorporate Beacon into their regular Internet websites; when Facebook users visit a business website and purchase a product or sign up for a service, businesses who use Beacon can announce that action on that user's Facebook profile or in that user's newsfeed, which is distributed to all of that user's friends. Beacon is promoted to future advertisers as a more "organic" and "social" way to reach future customers:

Promote your business in an organic, social way. Facebook Beacon enables your brand or business to gain access to viral distribution within Facebook. Stories of a user's engagement with your site may be displayed in his or her profile and in News Feed. These stories will act as a word-of-mouth promotion for your business and may be seen by friends who are also likely to be interested in your product. (Facebook, 2008d)

With Beacon, for example, Facebook users can share with their network of friends when they post an item for sale on eBay, rent a movie on Blockbuster.com or rate a book on Amazon.com. This form of advertising operates on the premise that effective brand communication should move not from the brand to the consumer but from the consumer to his or her friends and family.

With "Social Ads," Facebook permits advertisers to attach advertisement messages to the user notifications that appear as a result of a user visiting a business Facebook Page or through Beacon. In addition, Facebook also allows marketers to create Facebook ads by targeting users using any number of traits users volunteer on their profiles, such as age, political preferences or interests and

activities. Facebook then serves up those ads either in a user's newsfeed, or in the left hand space on the page that is visible as users navigate through the site. Users thus navigate the site greeted not by random banner ads, but by those specifically targeted to them – advertising goods and services that might appeal to the particular Facebook identity they have created. Again, when advertising this capability to businesses, Facebook stresses the ease with which this new form of advertising becomes seamlessly integrated into the communities Facebook users form:

> Facebook Social Ads allow your businesses to become part of people's daily conversations. Ads can be displayed in the left hand Ad Space — visible to users as they browse Facebook to connect with their friends — as well as in the context of News Feed — attached to relevant social stories. The social stories, such as a friend's becoming a fan of your Facebook Page or a friend's taking an action on your website, make your ad more interesting and more relevant. Social Ads are placed in highly visible parts of the site without interrupting the user experience on Facebook. (Facebook, 2008e)

This new suite of Facebook advertising tools was not received well by all Facebook users. There are well over 500 members on the Facebook group page titled "Stand Up! Don't Let Facebook Invade Your Social Life With Ads!" In addition, over 2,000 users swiftly signed on with Moveon.org's protest of Facebook's initiation of Social Ads, and Facebook users created a petition against the Social Ads which had 5,000 signatures by the end of its first day, November 20, 2007. A month later, when users were finally provided a permanent "opt-out" to Social Ads, there were over 80,000 signatures (Petition: Facebook, stop invading my privacy, 2007). Beyond resistance in the form of petitions, angry blog entries, and web articles, Facebook user-software developers also collaboratively discovered ways to rewrite the applications for the Social Ads so they would not pop up on the screen, essentially attempting to eliminate the commodification invasion into their social network space. However, Social Ads are still rampant on Facebook, and for the average user it is difficult to escape this advertising.

How does all of this advertising affect community and learning on Facebook? Some consumer researchers argue that consumer culture has fostered rather than destroyed community, and it is possible for real communities to form around brands. Muniz and O'Guinn (2001), for example, argue that "brand communities" – communities that form around some kind of affection towards a particular brand – are "neither any more nor less real than other forms of community" – they are simply "essential form[s] human[s] invariably employ in their social existence. . . Consumers seek communal affiliation and are likely to foster it wherever they can" (p. 426). Consumer researchers such as Kates (2002), for instance, view consumption as a "critical site in which identities, boundaries and shared meanings are forged" (p. 385). Brands and products provide users with points of connection which grow multiple forms of communities (Arvidsson, 2005; Cova & Cova, 2001). The groups that are increasingly forming around brands within Facebook, then, could be positioned as fostering community, friendship, and social learning.

While some consumer researchers such as Muniz and O'Guinn (2001) posit that "brand communities" can foster positive social interaction and form real community, Arvidsson (2005) argues that brand communities are one more way that brands exploit consumers. Arvidsson (2005) positions the unpaid, "social," work that individuals do within brand communities – talking about brands, sharing information about brands, bonding over brands –as immaterial labor, and argues that brands exploit consumers through harnessing and appropriating this productive immaterial labor in the service of the brand and ultimately of capital. The immaterial labor consumers in pro-brand communities engage creates what Arvidsson (2005) calls "ethical surplus;" this ethical surplus, through

the facilitation of brand management (which seeks to shape immaterial labor so that it conforms to the brand's well-crafted image), contributes positively to "the form of life that the brand embodies" (p. 250). The immaterial labor of consumers, then, enacted through brand communities, increases the positive reputation of brands, and thus works to increase the value of brands as measured in reduced marketing costs and increased product sales. Arvidsson (2005) argues that this exploitation hinges on an even more fundamental issue. When communities revolve around brands, and the "productive sociality of consumers" (p. 251) is shaped and limited by brand management, this "impedes the very real productive potential of contemporary social relations" (p. 252).

The power of brand management can only go so far, however; as Gramsci (1971) argued, culture always holds within it both hegemonic and resistant possibilities. Within Facebook there is also evidence of critical learning centered on not praising and sharing brand lifestyles, but on *critiquing* brands. We thus also see the potential for Facebook to foster communities that are drawn together with a sense of political purpose and that engage in what Brookfield (2005, p. 31) calls "political learning." The creation of community is, in fact, necessary for the enactment of critical, political learning. Brookfield (2005), following Gramsci, argues that political learning, or the formation of a critical political consciousness, can only form when an individual is part of a collective community. In Facebook, users are forming communities around the identities they locate within brands; not just in support of brands, but also in *opposition* to them. Type the word "Nike" into a Facebook group search and you will receive over 500 pages dedicated to Nike in some aspect. Users decide what aspect of Nike they form their group page around. Some choose to engage in pro-brand brand communities, and form brands around buying, selling, discussing specific styles and how Nikes are used in sports. Others take an oppositional stance, however, and create communities dedicated to resisting Nike, its labor practices, and its influence globally. It follows that brands, like Nike in this case—through brand management—recognize consumers' agency and do their best to shape that agency and locate themselves within a number of diverse possible identities (Arvidsson, 2005; Marshall, 2002). However, it is through this consumer agency that we are free to accept any of the possible constructed identities presented by the brand, or to foster critical agencies to produce new shared meanings and resistant social identities, as demonstrated by the anti-Nike group pages.

There is thus a negotiated process between brands and consumers, with both exerting a measure of authority and power. In online networked platforms like Facebook, versus a television advertisement, consumers are less passive in the meaning making process because of their ability in the space to literally author new text about a brand. Even though each page contains advertisements, Facebook enables consumers to actively discuss and form groups around a shared meaning of a brand, a meaning perhaps not intended by the brand itself. How consumers use Facebook to form these groups shows how they are shaped by and actively re-create popular pedagogy, therefore Facebook is "at once a site of hegemonic power and of political resistance" (Sandlin, 2007, p. 75).

CONCLUSION

Adult education is rapidly changing and Castells' (1996) network society sheds light on a new form of social organization. The confluence of communication and information technologies of cooperation into our daily lives has "networked" us (Enriquez, 2008). Our world has become more mobile and better linked. Emerging technologically mediated spaces allow for new ways of socially organizing and social interaction across digital online networks (Castells, 1996).

The exploration of Facebook through the re-

conceptualization of community illuminates the collaborative learning process taking place there. It also establishes a context for understanding the way in which knowledge and information are produced or commodified. Along with learning about issues of identity and subject positionality, learners who engage in spaces of public pedagogy, particularly in Facebook, also engage with various conceptions of what it means to be a "learner," a "community member," a "consumer," and a "citizen." There are transformational possibilities as well as regressive problems existing within an online network platform like Facebook. This chapter has introduced some of these possibilities and problems as a way to further explore emerging digital media and their impact on adult learning.

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Chapter 15
Adult Learners Learning Online:
A Case Study of a Blogging Experience

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ABSTRACT

This chapter presents a case study in which an online experience for adult learners facilitated improved understanding of blogs and its applications to K-12 classrooms. Data were primarily derived from archived documentation provided by students as components of several completed course assignments. The case study illustrates and examines how the online experience, specifically the creation and maintenance of a blog, supported student learning about use and application of a specific technology. The chapter discusses processes and results given the contexts of adult learning and instructional technology as well as suggests directions for effective practice.

INTRODUCTION

The blogging experience was one of the assignments I enjoyed most because it is one that is applicable to both my personal and professional life. Watching the blog grow, with contributions from my classmates and our acquaintances, was both interesting and educational, and I feel that our blog turned into a good source of information and resources on our topic, nutrition for students in the middle grades. I also enjoyed the opportunity to work cooperatively with my group mates; one of the disadvantages of online classes is the lack of interaction with others taking the course. Since completing this assignment I have read and contributed to others' blogs outside of this course and have also started working on my personal blog, with poems, images, and musings about life in general. (School Library Media Student B)

Adult learning is a vast frontier for those who want to enhance access and promote success in one's professional development. The literature identifies that adults are physiologically, psychologically, and sociologically more diverse than children and with varying needs (Lieb, 1991; Long, 1998). They learn best when prior learning is tapped and

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content learned is meeting their needs. Motivation is high when learning activities are supported by interaction or dialogue and opportunities for self-direction. Also, mistakes are seen as opportunities to further one's learning. For many adult learners, instruction becomes engaging when critical thinking and problem solving have become part and parcel of the process of gaining practice experience.

Given hectic schedules and multiple demands to an adult lifestyle (AASCU, 2006), getting an education online has become an industry within higher education. Course management systems (i.e., *Blackboard*, *WebCT*, *Angel*, etc.) have provided delivery platforms to private entities as competitors of traditional institutions of higher education by offering educational opportunities to those who have difficulty taking on-campus courses in the past.

Online learning, in this context, means all or the combination of the following characteristics: "knows no time zones, location and distance"; "access the online materials at anytime"; "real time interaction between students and the instructor"; and "use the Internet to access up-to-date and relevant learning material; and communicate with experts in the field" (Anderson & Elloumi, 2004, p. 5). Stokes (2008) argues that online learning can support working adults in their pursuit for an education by the ability to go to school despite their busy schedule.

Online learning has the potential of meeting the educational needs of adult learners. Literature about online learning identifies increased participation by adults on web-based activities like content creation and interactive conversations (Courtney, 2007; Madden & Fox, 2006). Also, emerging technology-based tools (e.g., blogs, wikis, podcasts, etc.) provide new ways to support adult learners in 1) learning content; 2) communicating and collaborating with peers; 3) facilitating critical thinking and problem-solving; and 4) producing creative and appropriate outcomes for target audience (Egbert, 2009). For example, blogs could provide new spaces to learn and share information on variety of content and for different audiences. However, this technological innovation presents enormous challenges for many educators and administrators providing educational experiences for adults due to lack of experience and understanding the potential of this technology-based tool in various contexts.

As a case study, this chapter focuses on how the creation and maintenance of a blog has enhanced the understanding of adult learners on how it can support teaching and learning processes. Blogs began as "web pages that were created and maintained by individuals who made it their practice to monitor the Web" (Warlick, p. 25). However, blogs are about posted entries, not web pages. Solomon & Schrum (2008) explains a blog as "a set of personal commentaries on issues the author deems important" (p. 55). It is a user-generated website that uses texts, images and links to other blogs, web pages and, other media related to its topic. Readers reply to posted entries, promoting open dialogue and community building, that are displayed in a reverse chronological order (Hurlburl, 2008). The literature identifies many applications of this tool in the writing process like maintaining a writer's journal or keeping a daily log of activities (Windham, 2008).

Blogs are natural tools for writing instruction, from brainstorming to organizing to writing, revising, and peer review, they are tools that lend themselves to the writing process. Since there's a comment box, blogs are important in peer editing and sharing thoughts on the ideas presented (Solomon & Schrum, 2008, p. 81)

The case study discusses how adult learners acquire new knowledge on specific content areas through the blogging experience. It discusses how a blog and a blogging experience become an appropriate and effective online learning tool and activity to support the delivery of a professional development program. It discusses practical challenges of working with adult learners in an online learning environment. The goal of this chapter is

to appeal to individuals with a professional interest in online learning using a specific technology. Anyone working with adult learners or anyone engaged in distance learning activities will also find this chapter useful.

Framing the Educational Experience of Adult Learners

Adults as learners have become a major population in many institutions of higher education. AASCU (2006) states a large percentage of undergraduates can be categorized as non-traditional with the 25 years or older group comprising more than one-third of the student population. Stokes (2008) identifies this group not only as non-traditional but "largely working adults struggling to balance jobs, families and education" (p. 1). The Council for Adult and Experiential Learning (2000) argues that adult students have needs that are very different in comparison to traditional 18-22 year old students. Adult student needs require "different kinds of information about their educational option; institutional flexibility in curricular and support services; academic and motivational advising supportive of their life and career goals; and recognition of experience and work-based learning already obtained" (p. 4). In addition, Lieb (1991) identified the following characteristics: autonomous and self-directed; foundation of life experiences and knowledge; goal-oriented; relevancy-oriented; practical; need to be shown respect.

In developing courses for adult learners, it is important to use multiple instructional methods including experiential and problem-based methods to help them connect curricular concepts to useful knowledge and skills. Also, support systems need to be in place to assist adult students to develop the capacity to learn and to become self-directed, lifelong learners (CAEL, 2000). Finally, information technology should be used "to provide relevant and timely information and to enhance the learning experience" (p. 5).

Technology-Based Tools Supporting Learning at a Distance

The case study involves adult learners enrolled in an introductory graduate course in instructional technology delivered online by a university located in the southern United States in Spring 2008. The graduate course is required for those who plan to work in K-12 schools as mandated by the state government. Students in this course come from various disciplines outside of instructional technology and school library media -- business education, middle grades education, physical education, school counseling, and special education. Many, if not most students, have limited or basic knowledge and skills in using technology to support teaching and learning in K-12 classrooms.

The course delivery format includes the use of a course management system, identified as *WebCT Vista*. From the course catalog, it states that the course provides "an overview of communication and technology as it relates to teaching and learning; including the design, production and utilization of materials and operation of audiovisual equipment and microcomputers" (University of West Georgia, 2008, p. 226). With the proliferation of Web 2.0 technologies, the creation and use of blogs was identified as one of the key experiences in the course. As blogs become familiar to adult learners, they have the potential of redefining how this group of students learns in and out of the classroom (Baylen & Glacken, 2007). In this blogging experience, students would have an opportunity to better understand the nature and limitations of such a tool to support their own learning and teaching practices.

Making a Case for Adult Learners Online

The Blogging Experience

The blogging experience initiated students to the potential of a blog, a specific Web 2.0 technol-

ogy in supporting learning and teaching. One of the course goals was to provide students with a blogging experience that focused on knowledge-centered instructional tools involving students in research activities and engaging them in discussions (Glogoff, 2005). Given that the course is delivered online, the blogging experience was structured to run for approximately seven weeks and designed as a 3-part online activity: 1) developing a conceptual understanding from the literature through reading and discussion; 2) acquiring technical skills in setting up a blog; and 3) applying knowledge and skills by adding various elements to the blog set up. These different blogging experiences engaged students to be collaborative as well as self-directed in completing their tasks.

Students developed a conceptual understanding of blogs and blogging by reading David Warlick's book on *Classroom Blogging*. Initially, the instructor divided the class into four groups and assigned each a *Google* document. Using this electronic document, each student posted ideas and comments as input to a review of Warlick's book. After this interactive online exchange, students finalized the comments shared within their groups, then submitted a book review individually as a course assignment.

After the *GoogleDocs* experience, and armed with conceptual understanding of blogs and blogging, students were asked to prepare for their blog set up. Initial information was requested from the class members to be posted in the class bulletin board which included the following: names of team members (2 or 3); topic or focus of blog content related to education; potential roles that each team member would assume in the duration of completing the experience (e.g., blog creator, designer, developer, researcher, etc.); and a URL of the blog created by the group. Furthermore, the students were informed that the blog should include educational resources for elementary, middle or secondary school teachers and their students as well as the community at large. Also, the blogging experience should promote the creation of an online learning community among students in the class and the invited members of the community at large.

Once the initial information was posted in the discussion board, students received a step-by-step handout as a tutorial on how to create their own blog. For this experience, the students used a blogging application available at *blogger.com*. This time, they worked in pairs or groups of three to set up their blogs, start posting entries and adding various elements to enhance the blog's layout and appearance. As students built their blog structure, they were asked to provide relevant information on their selected topic. They were required to post Web-based resources with descriptions and commentaries especially on potential value and benefit to future readers and contributors. Also, students were asked to describe and share teaching and/or learning strategies involving available technology-based tools and materials. Finally, students were expected to engage in meaningful conversation with others about materials posted on the blog.

At the end of the blogging experience, students were asked to assess how it impacted them in support of student learning about blogs and blogging, and acquisition of knowledge and skills in using and integrating current and emerging technology. Also, students were asked to review the blogs created by their peers and discuss how they met the following expectations: 1) value to teachers, practitioners and students; 2) value to parents and community at large; 3) creative look; 4) layout and ease of navigation; and 5) quality of information. Students posted their reviews in the assigned bulletin board and were asked to respond to comments made by their peers.

Finally, after the review and discussion, each student was asked to email the instructor for their top choices of blogs that best fit these categories: 1) most informative to teachers/practitioners; 2) most creative use of digital images and texts; 3) best in professional look/layout; and 4) best in quality of engagement of blog members.

Table 1. Distribution of blog creators' major, level, and gender by academic discipline.

Academic Discipline	Major N=15	Level* N=15	Gender N=15
Business Education	1	M	F
Instructional Technology	2	M (1), E (1)	F
Middle Grades Education	2	C	F
Physical Education	1	M	M
School Counseling	1	M	F
School Library Media	6	M	F
Special Education	2	M	F

* C = Certification; M = Masters; E = Specialist

Data Collection

After the blogging experience, five blogs out of fourteen emerged as top student choices based on content, digital elements, structure/layout, and engagement. The top five blogs involved fifteen students as co-creators. The table below identifies the academic discipline, degree level sought, and gender of the 15 students involved in this case study. (Table 1)

Three of the blogs were created by a group of three students; one blog by a pair and the other by four students. Collected evidence of student learning from this blogging experience focused on these students as data sources. (Table 2)

Beyond the students' input from the online discussions, two other data sources were used to assess how the blogging experience supported student learning: 1) comments related to the impact of the blogging experience found in retrospective papers submitted at the end of term; and 2) blog entries in the five blogs that identified and discussed insights gained and applications to one's practice or discipline from the experience.

Data Analysis

Relevant texts from the identified sources of data were highlighted, then copied and pasted to a word document and finally, printed in preparation for data analysis (Wolcott, 1994). In the process of analyzing the data collected from various sources, electronic files were created to assist in organizing the generic themes and patterns initially identified. For example, the students provided titles to their blog entries either as "insights" or "applica-

Table 2. Distribution of blog creators' academic discipline, and gender by blog focus/content.

Blog Focus/ Content	# of Student Bloggers	Academic Discipline Composition of Participants	Gender Composition
A – Arts/Music	2	School Library Media & Instructional Technology	F (2)
B – Physical Education	3	School Library Media, Physical Education & Middle Grades Education	M, F (2)
C – Instructional Technology	4	School Library Media (2), Business Education & Special Education	(F (4)
D -- Cyberbullying	3	School Library Media, Counseling & Instructional Technology	F (3)
E – Health/Nutrition	3	School Library Media, Middle Grades Education & Special Education	F (3)

tions". This was helpful in identifying and moving relevant texts to their designated electronic files. It was a similar situation when retrospective papers were reviewed and analyzed. Students used subheadings to identify different sections of their paper. The subheading on "impact' helped identify relevant comments.

During the final stage of data analysis, the comparative method (Glaser & Straus, 1967) was used to analyze similarities and differences among relevant texts filed under the same theme or pattern. This facilitated the selection of relevant and appropriate transcripts that would be used to illustrate key points for discussion in this chapter.

Looking for Evidence of Student Learning

Blogging helped me see that communication — between students and teachers, teachers and parents, and teachers and teachers — is the key to creating learning communities. It is the key to helping learners read, write, publish, and connect. In the "old days" students did their own work and turned it in to the teacher. Now, everything can be shared and commented upon: the process becomes the learning experience, before the product is ever evaluated. (Middle Grades Education Student B)

What and how much did the student learn from the blogging experience? These are the key questions when this case study was initially set up. Did the students learn about blogs? Did the experience enhance their understanding of the technology-based tool and its potential for supporting learning in the classroom?

Impact of the Blogging Experience

At the end of the term, students wrote a retrospective paper that provided them an opportunity to reflect on what they learned from the course. One of the questions they were asked to respond to was to describe and reflect on assignments that made an impact on their thinking about using technology to support teaching and/or learning. Thirteen students out of the fifteen talked about the blogging experience as one of the assignments that made an impact on them.

For some, the impact of this blogging experience provided an opportunity to better understand blog as a tool or to create one for the first time.

I was apprehensive at first. It is a little intimidating to post something on the internet that anyone could read. But after I posted the first entry, and read some of the other posts, it became easier. I received help from the other members of the group when I needed it. It was helpful to work as a group, because we could collaborate and share ideas. (School Library Media Student A)

Finally, creating a blog was a good experience because I accomplished something that I had never tried. My initial impression of blogs was that they were something people did for recreation only. Now I can see how a counselor can use them as a professional tool to collaborate with other professionals and convey information to teachers, parents, students, and fellow counselors. (School Counseling Student)

The blogging experience was significant to me because it was my very first experience in creating and contributing to a blog. I can easily see the value in having a classroom blog for my students and parents. This would provide a great tool to work on group projects, communicate upcoming homework assignments and tests. (Business Education Student)

Blogging for Learning [the assignment title] *required research and development of an education topic, presenting the information, and continued communication about the topic. It was a group effort, and I was fortunate enough to have great team members. My group members participated in all aspects of the project.* (School Library Media Student E)

My thinking about blogging changed completely as I worked on this assignment. I had never considered blogging as a teaching tool before;

now I believe it can be a very effective teaching tool. (Middle Grades Education Student B)

Others saw the impact of the blogging experience as an opportunity of gaining new skills to support current classroom practices or bringing their level of literacy with technology to the next level.

I have created a blog to communicate with my colleagues. I have learned to use ... were time consuming, but I have learned some valuable tools that will take my teaching style to the next level. (Physical Education Student)

Great insightful ideas about the use of this savvy tool would assist in developing classroom mindset about the use of technology as it did mine to support teaching and learning. Blogging opened my creative awareness to the many facets that can deploy student's imagination. Creating class or school blogs as a group can be the start of an ongoing learning tradition. I was amazed at the professional ideas and format used by my peers. This tool can be used outside of the classroom and help to integrate parental and community involvement. (Special Education Student A)

The experience of creating our own blog provided an opportunity to produce a "real-life" application that is very relevant today. In the world around us, many people, at least those that make it a priority in their lives, are blogging their thoughts, communicating ideas, and sharing some important information every day on the Internet. As future educators, we will benefit by knowing how to use the blogging tools to incorporate the process into some of our classroom and media center instruction. The blogging experience is one that can be used to promote creativity, as well as, the sharing of information and ideas among students. (School Library Media Student F)

Classroom blogs invite dialogue about ethics, quality of writing, critical thinking, organization and research skills, as well reinforcing the content creator in all learners. (Instructional Technology Student A)

An element of surprise seemed evident in their writing on how the blogging experience impacted them as learners and practitioners. Several students stated in their writing that they could not believe what they had accomplished after the experience.

Actually participating in the blog was an important step in this learning process, as it led to my change in thought process. I did not receive any assistance from outside sources on any of the projects mentioned (other than, obviously, collaborating with partners on the blog). I like to learn by doing, so I enjoyed the process of reading and acting on my own. Making mistakes along the way helped me to see how I could improve the next time, and helped me to realize what kind of questions and problems would occur if I used the project with students. (School Counseling Student)

This tool [referring to the blog application] *could open possibilities for students to be creative as well as better informed about their classroom or their world, depending on the goal of the blog that was set up. I really got excited about this project. It was definitely my favorite! If someone had told me that I would be responsible for maintaining a blog during the next school year before completing this project, I would have panicked. Now, I see the great potential for learning through this technology and while it would be a time investment, I would gladly manage a blog site.* (Instructional Technology Student B)

[Blogging] *made me feel as though I had transitioned from "old school" to "new school" applications. Creating a Blog was not something that I thought that I would be doing anytime soon, so this experience gave me a new found confidence about my technological skills.* (School Library Media Student E)

[Blogging] *was significant to teaching because I realize how important collaboration is to student learning. Some teachers at my school are unfamiliar with blogging, and I would like to conduct an*

in-service to show them how students will benefit from collaborating and blogging with their classmates. (School Library Media Student A)

Insights Gained from the Blogging Experience

Until I had this assignment, I had read only a few blogs recreationally. I did not realize the implications that blogging could have for educating or counseling students. When used responsibly, blogging can be an excellent resource and means of communication and collaboration for educators. As for myself, I learned much about the technical aspect of setting up a blog, editing, and posting. There is a wealth of information on any particular subject on the internet; it takes time to sort through all of it, and it can be overwhelming. Done correctly, a blog can condense and summarize, saving the reader time and frustration. (School Counseling Student)

Students reported through their blog entries that creating and maintaining a blog was a positive experience. At first, they reported being apprehensive and scared at the initial stage of the experience. As they gained familiarity with terms used and improved their understanding of a blog and how it functions, they found the experience less intimidating and were able to see its value to K-12 teachers and students in developing research and critical thinking skills. They believed that the continued exposure made the experience not so scary and added enjoyment to the learning process.

I have never had a positive impression of blogs prior to this experience. I have seen some blogs were people are ranting on and on about particular topics. I could not see the usefulness of creating and participating in a blog. This experience has changed my impression of blogs. (Business Education Student)

I am enjoying blogging so much that I am going to start another blog about my other interest. This is a wonderful way to share information and get feedback from others. Also, I found out that I am way behind when it comes to utilizing technology to enhance my profession. (Physical Education Student)

It offers the additional bonus of providing a format to discuss the information with other readers. I learned that I enjoy communicating with others and discussing various educational issues. I also enjoy learning about new technologies and how to apply them in my practice. (School Counseling Student)

Second, students selected for this case study reported viewing their blogs as tools for communication and collaboration. Blogs are tools for communication like journal entries, research diaries, spaces to organize thoughts and resources (The EDUCAUSE Learning Initiative, 2005). Further, ELI described blogs as tools for collaboration when used as venue for posting reactions and reflections on current activities and practices, for extending in-class discussion, and for sharing resources.

I now see that they can be meaningful tools to communicate information to specific groups of people. In a classroom setting they keep students in tune with what is going on. Students are so accustomed to using technology at home and in their everyday lives; we should continue to build these skills in school. (Business Education Student)

I have enjoyed focusing on a topic outside my usual realm and learning about it. This happened because of the nature of our blog group: a Physical Education major opened the door to this topic. It shows that people can always be open to learn no matter what their interests are. In school, we will expect our students to expand, and we must also expand. That is what blogging has helped me to do. (Middle Grades Education Student B)

I found this blogging experience to be very engaging and intriguing. Often group projects can feel uneven, but in our group we each made timely and valuable contributions. (Instructional Technology Student A)

First of all I did not even know what a blog

was until this class. So by participating in blogging, I have come to learn about what blogging really consists of. I have enjoyed collaborating with my group members on a topic that I believe peaked all of our interests. I feel like I have really learned a lot about the benefits of integrating technology into the classroom, and I will carry this blog with me for when I become a teacher. (Special Education Student B)

Given these features, having a blog supporting classroom or media center activities allows for the development of a learning community where one could solicit and receive feedback.

I now truly see value in blogs, especially in education. I think they have a place in every classroom because they allow students to keep up with class at home and allow parents to easily communicate with the teacher. It is also beneficial to the introverted students who might have difficulty asking questions while at school. Unlike via email, the posts can benefit everybody subscribing to the blog rather than the sole email recipient. Overall, blogs allow for essential out-of-class dialogue. (School Library Media Student D)

[What] *I have gained is that there is so much to learn from other people. I am impressed by the posts of other bloggers in our class and those associated with our classmates. It is interesting to be part of such a diverse learning community.* (Middle Grades Education Student B)

I have a lot to learn about setting up a blog and managing one, but I feel that I've gotten a head start and have already started two personal blogs for future development, one professional, and one for my extended family to jointly develop as contributors. (Instructional Technology Student A)

I find that there are so many different blogs out there – from bird watching, hiking – to greyhound rescue blogs. I think blogs would be a great way for students to share ideas and communicate with each other. (School Library Media Student A)

In creating the blogs, students learned that challenges lurk but could be managed. Initially, apprehension was high given limited technical knowledge in building a blog. However, those initial feelings immediately diminished as students realized the user-friendliness of the blogging application software used. Once the technicalities had been managed, students began the daunting task of expressing one's ideas. For example, writing a coherent piece on a specific position or topic is not always easy to accomplish.

[Blogging] *in the beginning, I was a little apprehensive. I noticed a few blogs while surfing the net, but I didn't fully understand how they were created. I assumed that it was similar to building a website, which had to be complicated. After learning more about blogging, I realize that it isn't that difficult at all.* (School Library Media Student A)

In my usual chaos I felt, at times, a little overwhelmed. But I was determined to invest myself in the work and to make it mean something. And it did! (Instructional Technology Student A)

I have learned though, that most often it is the terminology that scares me away from new technology. The tools themselves are not hard to learn and I need to take more chances and dive right in. It's funny to me that people who talk BIG seem so smart, especially when it comes to technology. (School Library Media Student B)

This is my first time participating in blogging. The more I blog the more comfortable I have become with the practice. I have learned that it's not easy for me to express myself in writing. I am overcoming my phobia and becoming more comfortable using the computer. (Physical Education Student)

[Blogging] *takes effort to say something worthwhile. Opinions need to be backed up by meaningful sources to have real value. This requires searching and thinking things through and documenting -- activities which take time and attention to detail. I know this is a beneficial exercise, but it is not always easy to accomplish: it is easier just to state opinions.* (Middle Grades Education Student B)

Success in this blogging experience could not be measured immediately. Students might report increased interests in using this tool in their individual work contexts. This report could be counted as an indicator that the experience did influence how students view this tool in the teaching/learning contexts. However, the real measure of whether the goals of better understanding of blogs and their application in K-12 classrooms have been achieved would be evident when students start creating and using blogs to support their activities.

Over the course of this blogging experience I have gained several insights about myself. One is that while I have become more familiar with technologies this semester, there is still much room for growth and improvement. I am still somewhat apprehensive about experimenting with unfamiliar applications such as video and photos, but I hope to incorporate these into future postings. I think I will find using these to be easier than I think! (School Library Media Student C)

I think so many students are bored because we do not incorporate new learning tools into the subjects that we are teaching. Technology can provide so many resources and many of themes are free to use. I hope to see the school systems provide teachers with more training on how to use emerging technologies in the classroom. (Business Education Student)

I have always been interested in technological change as it relates to preparing music materials for my classes, such as new recording techniques and media. However, I have not really seriously considered how to involve the students in the use of technology as a tool they can use – hands on. The blog is one of several technological tools that I have learned about so far in this class with which students can interact within my class. I plan to incorporate some of these tools in my classes next year, especially the blog! (Instructional Technology Student B)

When I finally become a teacher I will ponder back on this blog and remember the benefits of incorporating technology into the classroom setting. I believe that I would like to continue blogging on other topics that are of interest to me. (Special Education Student B)

Blogging Applications to One's Practice or Discipline

Fifteen students were selected as sources of data for this case study. There were seven academic disciplines represented by the students in this blogging experience – school library media, instructional technology, middle grades education, special education, business education, physical education, and school counseling. From data sources, students reported how they saw blogs as part of their future practice and how it will impact their discipline – support content learning and professional development, communication and collaboration, critical thinking and problem solving, and engagement of the community at large (Egbert, 2009).

Supporting Content Learning and Professional Development

Blogs are an important part of my practice …. My subjects will be language arts and social studies, and I believe blogs are a great way to communicate my views on books, history and current events, and receive feedback from students and other teachers. (Middle Grades Education Student B)

When looking at blog usage in regards to music, several specific uses come to mind. Practice exercises could be placed within the blog and students could record and submit their rehearsals or playing exams. (Instructional Technology Student B)

Cyberbullying is a constant threat to our kids, and as a school counselor I must be informed about the subject in order to help the students that I counsel. Blogs can be helpful in various ways: as a resource for students who need information, as a way to understand that others have experienced the same issues, and as a way to spread information

that is helpful to those students who have suffered from bullying. (School Counseling Student)

In my middle school keyboarding class, I can use the blog to post links to the websites that we will be using for our classroom warm-up exercises. In the past I had to write the website addresses on the board and many students took a great deal of time to key the address correctly. By posting the link, the students can go directly to the site and begin their work. This will cut down on some of the time wasted and students can feel more confident about the assignment. I look forward to using this form of technology in my classroom. (Business Education Student)

As a future school library media specialist, blogs have several applications to my practice. As a professional I can read other media specialists' blogs to find out what they are doing at their schools; this will give me new ideas to try as well as learn how they deal with challenges, policies, and even everyday routines. (School Library Media Student C)

Supporting Communication and Collaboration

I can easily see how blogs can be used to contribute to the learning experience in the classroom. Blogs can be used to "help students connect to one another and to others outside the classroom, and to create networks of learning that promote reading, writing, and critical thinking." (Nelson 2005) I will definitely create a classroom blog for the courses that I will be teaching next school year. I think that they are a valuable resource for students to express themselves. (Business Education Student)

I will use blogs to communicate with parents. The parents will be able to find out what topics students are learning in class. I will use this tool to share ideas and discuss issues that are important to Physical Education. (Physical Education Student)

I plan to create a virtual book club for students (and may do one for parents as well if enough interest was generated). I will also encourage both students and teachers to create their own educational blogs. A teacher, class, small group of students, grade level, or even individual students, could create blogs similar to this one, dealing with a topic of study. I would give support in any way possible, from helping to set up the initial blog to searching for items of interest for the blog. Collaborating with students and teachers in this way will allow me to show support for what they are doing in the classroom as well as introduce them to useful new technologies. (School Library Media Student C)

[T]*he blog can be used as a general tool to promote interaction between educators, students, parents, as well as colleagues. Basic information can be disseminated in a way that other forms of communication would not necessarily be able to accomplish.* (Instructional Technology Student B)

Supporting Critical Thinking and Problem Solving

I would use blogs to have students review books, teachers discuss professional development, to organize school newsletters or newspapers, and for discussing research topics or authors. I'm sure there are 100 more ways that I can use blogs as a media specialist, but I can't think of them all. However, I look forward to setting them up and encouraging my students and teachers to use them. (School Library Media Student E)

The goal of blogging is to enhance the students' educational experience. It is the hope that the blog could be used as a tool to foster creative thinking, research skills, and technology skills. I think the students will be more interested in creating a blog rather than a standard research paper and will put more effort into project. Blogs can be a win-win for everyone involved. It can assist the

teachers by allowing the students to help "teach" each other, as well as provide a more interesting learning environment for the students. (Middle Grades Education Student A)

The possibility of truly digging into a subject, researching, following it, and posting comments about it on a regular basis seems like so much more of an in depth learning experience compared to just a one time "current event" write-up. (School Library Media Student F)

Supporting Engagement of the Community at Large

I plan to create a blog in which teachers, students, parents, and the local community can participate in book discussions. It will also serve as a medium for obtaining feedback, providing summer reading lists, promoting media center events, accessing research databases, obtaining synopses of books and posting media center announcements. (School Library Media Student D)

Blogs will also be a great way for students to publish their writings and thoughts. Blogs can also cross cultures to join students together from other countries. Blogs are a way of expanding one's knowledge and learning in a community. As a teacher, I will strive to create viable learning communities, and blogs are an essential tool to meet this purpose. (Middle Grades Education Student B)

I envision the blogging experience to be somewhat of a replacement for the past "current events" projects, and much more robust in its capabilities. I see the potential to collaborate with core curriculum teachers to develop an ongoing dialogue via a classroom blog about a very critical or interesting current event taking place in the world (such as the Darfur Genocide blog I was recently exposed to through this class). (School Library Media Student F)

The music teacher could keep parents informed of class rules, expectations of the class as well as upcoming events such as performances, after school rehearsals, fundraisers, audition schedules and concert opportunities. Music projects could be discussed and explained within a blog with links to examples and references. (Instructional Technology Student B)

This would be a great way to promote and advertise all the materials and services that are available. This not only will help place value on my job, but encourage frequent visits from all. I could post policies and procedures, photographs and descriptions of students' outstanding work, material check out lists, and class sign-up sheets. I could offer a checklist for teachers so I can be ready for whatever they will need when they bring their class to the Media Center. I could ask for feedback so staff will offer suggestions and allow progress and growth to be based on input. These are always to encourage collaboration without interrupting the various schedules. (School Library Media Student B)

Implications of Using Blogs to Support Online Learning

I began this blogging exercise with a great deal of apprehension. When I initially looked at some of the blogs that were provided as examples, I was quite intimidated and feared it would be a difficult process to create one from scratch and give it a professional character. However, I was pleasantly surprised and pleased to find that after only a couple of sittings with the Google Blogger tool my anxiety decreased substantially, and I developed a certain confidence that I could work with it quite successfully. (School Library Media Student F)

There are many factors that can account for a positive and successful online experience. The literature identifies sound design as one of these factors. Powell (2003) identifies 1) familiarity with online learning by students; 2) clear and uncomplicated navigation and link structures; and 3) effective and timely communication as important elements in facilitating student comfort

in an online environment. Students, in this case study, initially struggled with apprehension on their technical skills. However, as they got familiar with structure and layout of the blog, students found themselves exploring and experimenting on what they could do to make their blog more appealing to their readers. Constant exchanges between students and the instructor in a question and feedback format also facilitated gaining a comfort level that assisted toward a positive disposition on blogs and blogging.

Maroulis and Reushle (2005) suggests that the creation of a positive online experience is facilitated by the following characteristics: 1) interaction and collaboration between peers and with the teacher as central to the learning process; 2) flexible format of learning activities; 3) authentic and reflective practice; 4) dynamic and ongoing learning community; 5) accessible support structures; and 6) timely technical support. Putting the students in small groups made them less dependent on the instructor for constant questioning and feedback. They had their peers to connect with as they encountered challenges in building their blogs. Decisions on what to include in the blogs were made at the group level and the instructor provided the initial parameters as guides for task completion.

Finally, a study on online collaborative learning in secondary schools in Malaysia found that individual motivation is key to a successful experience (Koo, Lee, & Chin, 2005) followed by setting of goals, quality of group work, and group members' commitment to completing the project. In reviewing the blogs completed by the students, it seems safe to assume that the top choices were products of good goals, collaborative group work, and strong group commitment. Many of these factors contributed to the blogging experience of adult students.

Given the findings from this case study, the following are provided as recommendations to improving practice. First, it is important to gain accurate data on prior experience. Data might include information on basic knowledge and skills in using technology (hardware and software) in various contexts. Available technology for classroom use might be quite different for those in office settings. Also, information on disposition (or attitude) towards using technology in one's practice if available, might be useful to ease the introduction of new technologies. It is important to note that fear of using a specific tool is quite different to resistance. Being afraid is something that is instinctive and a natural reaction. Resistance, on the other hand, results from making a choice and is a much more challenging disposition to overcome.

Second, the availability of authentic learning experiences is critical for adult learners. In this blogging experience, the act of creating a blog provides a very authentic learning experience. However, limited time and other demands from personal and professional contexts reduce the ability of the students to provide comments to other blogs and solicit active participation from external blog contributors. To simulate online exchanges in a blog, it is recommended that students select another blog to engage with given the timeframe in completing the assignment. Students will provide weekly commentaries and feedback to promote interactivity.

Third, in developing a learning community within a blog or across blogs, students should be encouraged to continuously make connections between content, peers, teacher and technology. It is recommended that students should focus on a blog entry (posting or comment) to one of the above mentioned on a weekly basis. For example, in the first week, a student may post a reflection on an online article related to the blog's content. The following week, a comment directed towards a peer or the instructor will be made. In another week, a blog entry on related technology may be shared.

Fourth, the use of role play or facilitation might enhance engagement and participation in a blog. Taking different roles or positions in an online

exchange may fuel engaged conversations on specific issues or topics. Good facilitation skills on the part of the blog creator may push a conversation of an issue or topic to greater clarity and understanding. It is recommended that students are provided with experiences to develop these online skills.

CONCLUSION

Over the course of this blogging experience I have gained several insights about myself. One is that while I have become more familiar with technologies this semester, there is still much room for growth and improvement. I am still somewhat apprehensive about experimenting with unfamiliar applications such as video and photos, but I hope to incorporate these into future postings. I think I will find using these to be easier than I think! (School Library Media Student C)

Students reported that they have learned not only about the technical aspects of creating a blog but also understand the potential applications and opportunities that this tool brings in and out of the K-12 classroom. In addition, reactions and reflections posted and submitted by the students indicated learning beyond knowledge and skills and more so about themselves and their capacity to go beyond their comfort zones. Creating blogs and blogging, in this case study, have proven to be an exciting and challenging experience among these adult learners.

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Chapter 16
Teaching Technology to Digital Immigrants:
Strategies for Success

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ABSTRACT

Someone has to prepare faculty who are in need of technology skills. For example, in Louisiana, in response to Hurricanes Katrina and Rita, every faculty member at the university level has to have a Blackboard presence and a disaster plan so that classes can continue in the event of a catastrophe. Those faculty called upon to assist their peers in complying with the directives are often chosen only because they are more comfortable than others with technology. Often, trainees are uncomfortable in such training, and senior faculty, often later "digital immigrants," can be resentful. The researchers and authors of this paper have garnered $443,658 in grants involving training faculty in instructional technology. Through their experiences, the authors and researchers have isolated seven key practices that make such training successful. This article describes those practices and supports the findings of the primary research with secondary research on andragogy and Marc Prensky's ideas of the literacy divide that exists between "digital natives" and "digital immigrants." By considering the basic tenets of adult education, we can be better facilitators of valuable training sessions that will bridge the digital divide.

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INTRODUCTION

John Dewey was a pioneer in the field of education, namely with his contribution to educational theory. One of the basic tenets of Dewey's 1938 publication *Experience and Education* is the idea of a democratic educational experience, also known as the progressive movement. Dewey believed that education should be both "accessible and [enjoyable]" (p. 34) rather than the traditional authoritative experience in which the teacher is the holder of all relevant knowledge and the student is an empty vessel to be filled with that knowledge. Like Freire (1977) decades later, Dewey valued the prior individual experiences of the learner and claimed that "all genuine education comes about through experience" (Freire 1977: p. 25).

In 1973, another educational pioneer, Malcolm Knowles, introduced us to his theories of education. While Knowles' predecessors theorized about learners in a more general way, Knowles himself focused on the adult learner. With Dewey's progressive theories in mind, Knowles established the "groundbreaking" idea of "andragogy and the concept that adults and children learn differently" (Knowles, et al, 2005, p. 1). Knowles and his co-authors define andragogy, in part, as "'an honest attempt to focus on the learner'" (p. 1). Whereas Knowles pioneered the actual theory of andragogy, Galbraith (1990) and others have made significant contributions where actual teaching methods are concerned. In Galbraith's *Adult Learning Methods* text, eight chapters focus on foundational perspectives of adult education, a few center on instructional design, and this text, currently in its third edition, clearly has college instructors in mind, which is the focus of our research in this article. Specifically, we will examine, in part, the literacy divide that exists between "digital natives" and "digital immigrants," terms coined by Marc Prensky (Prensky 2001). Then we will use that information to support and explain what we have found to be best practices in educating digital immigrants in instructional technology. Our best practices are derived from over ten years of educating high school and college-level faculty in instructional technology. This training was funded by $443,658, total, in grant funds from Louisiana Systemic Initiatives Program (LaSip) ($222,741), Louisiana Board of Regents Traditional Enhancement Grant Program ($120,159), Louisiana Board of Regents SELECT Grant Program ($89,258), and Louisiana Tech University Research ($11,500). The result of our primary and secondary research is a list of seven key "do's" when training faculty in instructional technology.

BACKGROUND

When the term "digital divide" was first mentioned in a 1995 report from the National Telecommunications and Information Administration (NTIA), physical access was the primary topic of discussion. The subtitle alone, "A Survey of the 'Have Nots' in Rural and Urban America" attests to the goals of this report on the digital divide (*Falling*, 1995). But since the publication of this report, researchers (Warschauer, 2002, 2003; Cooper & Weaver, 2003; Solomon, et al, 2003; van Dijk & Hacker, 2003; Enoch, Y. & Soker, 2006) have noticed other trends—cultural ones rather than physical ones—that prevent certain people from reaping the benefits that technology has to offer. Some of these barriers include gender, social class, urban versus rural community, and age. In US society, as some researchers (van Dijk & Hacker, 2003; Warschauer, 2003) have discussed, physical access to technology is widespread; therefore, "the key issue is not unequal access to computers but rather the unequal ways that computers are used" (Warschauer, p. 46). Indeed, there exists a clear gap between digital natives and digital immigrants in terms of how these groups utilize available technology.

In Prensky's words, "Today's students—K through college—represent the first generations to grow up with this new [digital] technology"

(2001, p. 1). So if we think about this fact from the perspective of established faculty members, it is apparent that many of us are the immigrants whereas our students are the digital natives. This potential dilemma places faculty members in the interesting position of being behind the learning curve when it comes to our students and technology.

Educational theorists such as Dewey and Knowles have already established that we as educators do not really know as much as we might think. Rogers goes so far as to say that the role of the teacher is "vastly over-rated" (Rogers, 1969, p. 103) and that we should view ourselves as mere "[facilitators] of learning" (pp. 164 – 166). But what happens when university instructors, perhaps because of the age factor of the digital divide (because they might be "digital immigrants"), are unable or unwilling to try and bridge the gap between them and their students in terms of technological literacy? The problem here is not that the instructors are merely behind their students when it comes to digital literacy; the problem is that these instructors may be missing out on the potential benefits that technology in the classroom can afford them.

BENEFITS OF TECHNOLOGY

Knowles, et al, (2005) "see technology as a force that presents great opportunities for andragogical adult learning" (p. 236). According to the authors, enhancing classroom instruction with technology "directly caters to adults' desire to be self-directed in their learning;" it allows students opportunities "to tailor the learning experience to fit [both] their prior experiences" as well as "their real-world problems;" and "it often allows them to access 'just enough' to solve the problems that led them to the learning in the first place" (p. 237). Building on and valuing prior experience might be key when it comes to engaging digital immigrants in technology workshops (Knowles 2005).

In terms of experience, Journet (2007) suggests that to engage digital immigrants in learning new technologies, we (the facilitators) should "recognize the expertise senior faculty bring and make connections between their interests and yours" (Journet 2007:117). In other words, the prior experiences of the trainees must be valued. While she discusses digital literacy in terms of senior faculty members specifically—or those faculty who have "'settled in until retirement in terms of career, institution, rank, and work responsibilities (in Sorcinelli, 1999, p. 63)—Journet's ideas easily carry over to digital immigrants in general, whether they are new faculty, mid-career, or senior faculty. Of course, newer faculty members are less likely to fall into the category of "digital immigrants" than are their more seasoned colleagues.

It is important to remember that learning new technologies benefits not only us as faculty but our students as well. If the instructor is well-versed in digital literacy, then he or she can act more efficiently as a facilitator to help prepare students to make the most of the available technology in the classroom environment. However, if the instructors themselves are not using available technology, then it is not possible to facilitate this type of learning; moreover, these digital immigrants may not even have the very basic technological skills that are becoming more and more commonplace, such as use of Blackboard, email, and presentation software. Hence, the remainder of this paper will focus on the importance of training university faculty (at least those of us who fall into the "digital immigrants" category) to be more skilled in various areas of digital/technological literacy, not only so they can become better facilitators within the classroom, but also so that they can gain the more basic digital knowledge that will keep them on par with new (and probably younger) faculty.

One might wonder how teaching technology relates to college writing—that is, perhaps one might if one did not actually teach college writing. Writing is no longer the province of the pen and typewriter. For students to be successful writers

in the college classroom, they must be able to use the tools of the college classroom—often the computer. Research happens as often in cyberspace as it does in a library. And dictionaries are often accessed via computer. Not all composition instructors are fresh out of an electronically-saturated graduate school environment. Someone has to prepare college instructors who are in need of technology skills, for example, in response to the Blackboard initiative in Louisiana (every faculty member at the university level has to have a Blackboard presence and a disaster plan) instituted as a result of Hurricanes Katrina and Rita.

Many of us as university faculty who are more comfortable with technology than our peers might be have been called upon offer faculty development workshops on a variety of topics, including

- Blackboard
- email basics
- PowerPoint
- webpage creation using html coding and various html editors such as Adobe Go Live and Dreamweaver
- Hot Potatoes
- MS Word's comment feature
- Adobe Photoshop
- Tegrity
- Taskstream
- Inspiration
- Camtasia

Obviously, as university faculty members, we appreciate the extra time and effort faculty are giving to gain new skills to better instruct students. In addition, we also know that they want the shortest, most efficient, and most effective training they can conceive of—nothing dissolves a faculty development's session participant's patient goodwill more quickly than a general feeling that the participant's time is being wasted.

TRAINING FACULTY: A BASIC LIST OF "DO'S"

When we began training faculty to use instructional technology, we drew upon the closest resource we had for do's and don't's—our own experiences as participants in instructional technology workshops. One first don't was clear—don't run an instructional technology workshop without allowing participants access to the technology. This "don't" came from one researcher's experiences: the first instructional technology workshop she attended as an instructor was a lecture on various types of technology—with no demonstration, and certainly no hands-on activities. We felt that sort of training was a waste of time and were sure that others would, too. Our list of "do's" became

- Do tell participants to bring some type of storage device—floppy, jump drive, etc. If possible provide participants with such devices as a prize for attending the session.
- Before the training session, contact participants or potential participants and tell them what the software can do for them and give them ideas to come to the session with. Tell participants to come with some sort of project in mind to work on. Plan for participants to have a "take away"—either a completed project, or a project under construction for a class they are working on or currently teaching.

The preceding two "do's" are in line with Thorndike's notion of "teaching as the control of learning by the management of reward" (in Knowles, et al, 2005, p. 76). In other words, providing participants with a storage device as a prize, albeit a useful one, could prove to be a good incentive for participation in the first place. Of course, if participants are not "interested, problem-oriented, and attentive" (p. 76) to begin with, then our task as trainer may be daunting. Nonetheless, with a practical topic such

as learning new technology, perhaps we can, as Knowles, et al, suggest, "manipulate the learning situation so that the learner accepts the problem posed because of the rewards involved" (p. 76). Sorcinelli, in discussing "measures of reward and recognition" for faculty development workshops, suggests that recognition in campus publications, plaques, or some other form of acknowledgement might be good incentives for the amount of time faculty put into these kinds of training workshops (1999, p. 69).

Of course, a physical reward, such as a storage device or a plaque, is only part of the actual prize; the practical knowledge gained is as much of an incentive, even if we have to convince the trainees of this fact. But the topic of incentives is certainly worthy of consideration. To engage digital immigrants in learning new technologies, we might need to specifically address the question of "What's in it for me?"

It is interesting to point out that certain colleagues might be less inclined to attend training sessions. In terms of faculty development, studies "indicate that senior faculty are somewhat less likely than junior faculty to seek out individual consultation or partake in teaching development workshops on their own (in Sorcinelli, 1999, p. 67). Therefore, as facilitators of technology workshops, we must provide an answer to the above question. Journet suggests offering digital immigrants "chances to engage in both the production *and* the analysis of their own multimodal compositions so that they can get a sense, for themselves, of the powerful affordances of different modalities" (2007, p. 117). In other words, we must help them to see firsthand how digital literacy can benefit them.

- Do allow participants access to the technology being presented, and make sure they will have access to the technology for their own use later (either give them the software at the presentation or let them know how to download it or access the computer lab with the software when they need to use it).
- Do present the schedule of activities and session goals at the beginning of the training session—a hard-copy detailed schedule is not too much to give adult learners. It's also useful if they have to write a report on the training later (in case they are being reimbursed, for example).

The preceding "do" will, in part, satisfy one of the typical challenges of training or teaching adults: "to discover the problematic element that will arouse and maintain the interest of adult learners regardless of their global or specific motives for learning" (Long, 2005, p. 28). If the trainees can actually see in advance what they will learn in the session, then they will be more likely to participate actively in the session. So it would be wise to include not only a schedule of events, but also some clearly stated ways that the training will benefit the learner.

- Do limit training to two hours, and whenever possible, try to make the second hour a voluntary workshop targeting participants who need more help or who just want to keep working on projects with the availability of assistance.

The preceding "do" is partially in line with Long's (2005) list of physiological variables that must be considered when teaching adults. These variables apply mostly to older faculty members, or senior faculty, but these physical characteristics are nonetheless important to consider, even if only a portion of our trainees fall into this category.

However, it is these senior faculty who often fall into the category of digital immigrants; therefore, we should consider the possibility that many of the learners in technology workshops will be senior faculty who may exhibit one or more of the characteristics Long discusses, such as "diminished auditory and visual acuity, reduced energy levels,

and increasing frequency of health problems" (pp. 28-29). So the point here is that we should not expect all of our learners to be physically comfortable sitting through an all-day workshop, and if participants are not comfortable, then they will not learn efficiently. But regardless of the preceding physiological concerns, it is important to "Offer professional development opportunities that meet the needs of senior faculty" (Journet, 2007, p. 117) or of any faculty members who are in need of technology training. One simple way to do this is to consider "scheduling between terms or in the summer months" (Journet, 2007, p. 117).

- Do make yourself available to participants after the training in case they have questions, run into difficulties, or just want more information. The training doesn't end when the session ends.
- Do encourage participants to veer off course and play or move ahead in the training. Participants will learn more and have more fun if they are in charge of their experiences.

The preceding "do" is in line with some theories of self-directed learning (Brookfield, 1986; Candy, 1991; Knowles, 1975; Knowles, et al, 2005). Here, we will use Knowles, et al's definition of self-directed learning, which "is seen as self-teaching, whereby learners are capable of taking control of the mechanics and techniques of teaching themselves a particular subject" (Knowles, et al, p. 185). Citing Candy's (1991) ideas of autodaxity, Knowles, et al (2005) state that when learners take ownership over their learning, it "leads to an internal change of consciousness in which the learner sees knowledge as contextual and freely questions what is learned" (p. 186). So in these technology training sessions, we would encourage faculty to work at their own pace and to practice self-teaching as much as possible. Another benefit of this "do" comes from Journet's own experiences, which suggest that "the allure of pleasure or creativity" (2007, p. 117) when engaging learners in new technologies should not be underestimated. In other words, if we allow trainees the opportunity to play with the technology and to see that it might actually be fun, then they might be more likely to learn it.

DIGITAL IMMIGRANTS VS. DIGITAL NATIVES

At the 2006 Beyond Boundaries: Integrating Technology into Teaching and Learning conference at the University of North Dakota, we heard Marc Prensky, CEO of games2train in New York and author of *Don't Bother Me Mom—I'm Learning!* presented two sessions, one entitled "Engage Me Or Enrage Me: Educating Today's 'Digital Native' Learners." While we actually disagree with a lot of what Prensky says about students and student needs today—for example, none of us are going to consider letting our students use their cell phones to call their friends during exams—we think everyone was struck with the accuracy of his example of digital immigrants vs. digital natives. Just as natives are born in a country and speak the native language and are comfortable with the native customs, digital natives are the generation born in the digital age, the students who grew up never knowing a world without computers. They are comfortable with technology and have handled and used it all their lives. And just as persons who immigrate to another country at a young age may adapt very well to the new environment, they are still immigrants. They may still have accents and still think along the lines of the native country and not the new country. It has been commented that digital natives use their cell phones to tell time, while early digital immigrants may be very technologically savvy with the latest cell phone gizmos, but will still wear watches to tell time. Another test to tell the digital native from the early digital immigrant and later digital immigrant involves handing the test subject a digital camera and ask-

ing the subject to perform a desired function. A digital native, understanding that the technology should be intuitive, would begin to play with the camera. The early digital immigrant may also begin to play with the camera, or may Google the instructions for the function on the Internet. The later digital immigrant may likely look for the box the camera came in to attempt to find the instructions. Those who immigrated at a young age can be contrasted to recent immigrants who have thick accents and a hard time figuring out the ways of the new country. We think many instructors at this point in time are digital immigrants in some form—even though we may have very slight accents. After all, when we want to know what time it is, we look at our watches, not our cell phones. We know our cell phones display the time, but we are still used to the ways of the "old" country. We want watches.

The problem encountered throughout the research into best practices in teaching faculty instructional technology was that those who are tapped to lead such faculty development workshops are often tapped because they are "good" with technology. Their first reaction is to play with the technology in an unstructured way, and since instructors often create teaching materials to meet their own learning styles, early faculty development workshops in the research were unstructured to cater to the early digital immigrants. The result was frustration on the part of learners because they were generally not early digital immigrants, but later digital immigrants. The learning materials did not match the intended audience, and this problem led to the research and resulting key "do's" that we found.

As stated previously, many of the faculty who fall into the later digital immigrants category are considered senior faculty. We all have heard the clichés which suggest that we as humans tend to become set in our habits, that we often fear change. Such is the case for senior faculty members (and even some faculty who are mid-career) who avoid technology of any kind. We all know our colleagues who are recent, and perhaps unwilling immigrants into the digital country, who never think about "Googling" to find out the weather for tomorrow. One of our digital immigrant colleagues recently received an Adobe file as an attachment and could not get it open. When he returned it to the sender with a message that the file would not work, he was informed that it was an Adobe file. He called a colleague into his office to ask about the situation and asked, "Do I know Dr. Adobe? Is that a new dean?" Those of us who "immigrated" at an earlier age, when presented with an unknown file form, would probably turn to the web to help us access the information needed to solve the problem. We can function in the old country, but we are usually comfortable in our chosen digital home.

The digital natives, however, our students (with some exceptions), are fluent with the new and ever-changing technologies in a way that the immigrants can never be. It's a different way of thinking and functioning, and it has some bearing on different types of adult learners in instructional technology workshops because those of us running the workshops—the earlier digital immigrants—can make assumptions that are frustrating to the faculty who have the most to gain from the instructional technology workshops—the later digital immigrants.

The key difference in the two types of faculty stems from the last "do." Earlier digital immigrants are like digital natives in that when we receive a new piece of technology or software, we "play" with it until it works. It's not uncommon for a colleague to hand one of us a digital camera or cell phone and ask us to make it perform a function. We can do it—usually in a few minutes—but we have great difficulty telling the owner how we made the technology perform the desired task. Why? We understand that the road to achieve the goal is not linear. The technology has been programmed to be intuitive. We're comfortable with looking for the logical buttons to push until the goal is achieved. And we are having so much fun in solving the problem, that we forget that

this knowledge needs to be translated into a series of linear steps for our more recently immigrated colleagues. In other words, those of us who are more akin to digital natives tend to forget the very theories of adult education that we have studied, the methods that will better ensure assimilation into the digital society that is upon us. Fortunately, we have put aside this forgetful tendency because we realized the potential benefits that technology can afford to all faculty members.

FUTURE TRENDS

Faculty will likely always need professional development in instructional technology because instructional technology constantly grows, changes, and improves. For example, operating systems upgrade, and with those upgrades come new interfaces on old software standbys or even new features and functions. Old programs are phased out and new programs are phased in. Another training opportunity arises when an expensive favorite piece of software becomes available for free in a similar form via open source software. Training is here to stay. However, face to face training such as the type advocated here for later digital immigrants is becoming a thing of the past. Many companies and universities have already made widespread use of Just in Time (JiT) or desktop training, where employees access the technological training they need from the desktop. As this trend grows, the seven key "do's" could be adapted thus:

- Provide participants with portable storage devices such as jump drives or flash drives as incentives for completing desktop training.
- Provide participants with a real person behind the desktop training. Before the training session, that person should contact participants or potential participants and tell them what the software can do for them. If possible, design the training to assist participants with projects they are currently working on.
- Do allow participants access to the technology being presented, and make sure they will have access to the technology for their own use later.
- Do present the schedule of activities and session goals at the beginning of the training session. Make it printable so the participant can make a hard copy and refer to it throughout the training, if desired.
- Do limit training time and make desktop training in easily accessible segments tailored to suit the immediate needs of the participants. Ten minutes is a good time limit for a desktop training session.
- Do make a real person available to participants after the training in case they have questions, run into difficulties, or just want more information. The training doesn't end when the session ends.
- Do encourage participants to veer off course and play or move ahead in the training. Participants will learn more and have more fun if they are in charge of their experiences.

CONCLUSION

Journet (2007), who considers herself to be senior faculty, "[came] to digital media later in [her] career," (p. 107), and she has discovered, as no doubt many faculty members have, the multiple benefits of learning digital media. Journet, a composition teacher, lists a few concerns typical of digital immigrants when it comes to learning new technologies:

- How do new media mesh with what many of us have traditionally (and over a lifetime) considered our responsibilities as composition teachers?

- How do we negotiate difficulties attendant on becoming a learner in areas where we are accustomed to being experts?
- How can we find appropriate opportunities for professional development? (p. 108).

If we consider the basic tenets of adult education, then perhaps we can become better facilitators of training sessions that will help bridge the gap between digital immigrants and digital natives. A digital divide does exist in terms of age, and often mid-career and senior faculty fall into this gap, becoming what has been termed "digital immigrants." It is important to remember that becoming more technologically literate will benefit not only the faculty members themselves, but also their students. If we can bridge the gap, even partially, between digital immigrants and digital natives, then all of us will be better off. Therefore, it is crucial to address the concerns of our colleagues, and by adhering to the preceding list of "do's," we hope to do address the above concerns (and any other concerns that arise) as well as possible.

The most successful method of directing instructional technology workshops with faculty requires that the facilitators provide printed out, step-by-step instructions relevant to exactly what the faculty will be learning. In addition, faculty should be advised to arrive at the workshop with a storage device, a syllabus, a textbook, and a specific goal—and the facilitators should suggest specific goals to help the instructors best prepare. Whenever possible, faculty should be provided with "prizes" or incentives such as software, thumb drives, or other desirable items as a "thank you" for attending training.

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Chapter 17
Some Key Success Factors in Web-Based Corporate Training in Brazil

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ABSTRACT

Brazilian companies are increasingly turning to web-based corporate training by virtue of the fact that they need to train their employees within tight budget constraints in a country of continental dimensions. However, most of these companies do not know what the critical success factors in these endeavors are. Therefore, this chapter seeks to investigate some key success factors associated with such digital enterprises. In order to achieve this, the multiple case study method is used, whereby two cases, both conducted within the same Brazilian company, leading to opposite outcomes – a success and a failure – are analyzed in depth. Accordingly, the two aforementioned cases are investigated by using quantitative data analysis based on bi- and multi-variate linear regressions, as well as t-tests. The conclusions were that "Goal Orientation", "Source of Motivation", and "Metacognitive Support" were the three critical dimensions in these two web-based corporate training programs under analysis.

INTRODUCTION

Nowadays, market dynamics are becoming increasingly intense due to new strategic orientations and the pressing need for organizations to adapt themselves to new business models and regulatory frameworks. For this reason, it is of paramount importance for companies to become agile, as well as achieve low costs and high returns on investment associated with their employee training programs. On the other hand, the increasing speed of obsolescence in training content, plus the high costs of face-to-face training programs, as well as the logistic hurdles linked with their deployment - mainly in firms operating in countries of continental dimensions - like Brazil - are major barriers to the implementation of such face-to-face training programs.

Another aspect is that Information Technology (IT) is changing the way people search, locate, access and retrieve available knowledge, as well as

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altering the learning process and the way training is conducted (Hodgins, 2000). While employees take charge of their own learning process and professional development, the employers face new challenges in training and retaining teams with in-depth knowledge about their business (Hodgins, 2000).

It is in this context of rapid change, with massive information loads and the search for training programs, that web-based corporate distance training comes into its own. Information Technology can solve most of the problems associated with the hitherto existing employee training undertakings, enabling the implementation of corporate distance training programs (Rosemberg, 2001).

Despite being a key factor for developing feasible training programs, Information Technology *per se* is not a guarantee of success for these endeavors. Most of the time, it must be linked to pedagogical and didactical issues related to them. The specific characteristics of each training program must be analyzed in depth and considered as relevant as the implementation costs throughout the decision-making process (Clark, 1983).

The structuring of web-based training programs is no easy task as according to several scholars various critical success factors must be taken into consideration (see, for instance, Carey *et al*., 1998; Penuel & Roschelle, 1999).

In line with this, this article seeks to investigate what these critical factors are through the analysis of two distinct web-based training programs conducted within the same Brazilian company. Hence, the research question in this paper is: "What are the critical success factors associated with the implementation of these two web-based corporate training programs?"

In order to achieve this goal, this work is structured as follows. First, there is a section addressing the theoretical references used in this article. Then, the research method is outlined. After that, the two cases under analysis are described, and in the next section the results accrued from them are compared. Then, in the last two sections, the authors discuss the outcomes of the research and present some final comments.

BACKGROUND

In order to analyze the theoretical aspects related to distance training, it is necessary to examine three interrelated topics: psychology, education and information technology (Wilhelmsen *et al.,* 1998). More specifically, it is necessary to examine the main pedagogical approaches and the aspects of utilization of information technology as a way of applying same.

Pedagogical Approaches

With respect to pedagogical approaches, the two paradigms that became fundamentally influential from the 20th century onwards will be tangentially analyzed. These paradigms do not only include the vision of how the learning process is achieved, but also offer an insight into the very nature of knowledge – essentially, if knowledge exists in an absolute form, or if it is something that is constructed and relative. These two approaches are traditionally referred to as *instructivism/behaviorism* and *constructivism/cognitivism* (Wilhelmsen *et al*., 1998).

The basic distinction between *instructivism/behaviorism* and *constructivism/cognitivism* lies in the concept of knowledge. For the former, knowledge is passive – automatic responses to external factors – whereas for the latter, knowledge is seen as an entity constructed by each student throughout the learning process. Knowledge from the *constructivist/cognitivist* standpoint does not have absolute characteristics as in *instructivism/behaviorism,* and cannot therefore be simply passed on from one person to another (Wilhelmsen *et al*., 1998).

For the purposes of this article, the most important aspects of the *instructivist/behaviorist* approach are the concepts that the student must adapt

to the environment and that learning is a passive process in which there is no explicit treatment or interest in the mental processes. The student, in this case, merely responds to the demands of the environment (stimuli). Knowledge is therefore seen as something absolute and immutable (see, for example, Skinner, 1968; Wilhelmsen *et al*., 1998).

Thus, an *instructivist/behaviorist* approach to a given training program works well, provided that it has clearly defined objectives and its results are easily measurable. By way of example, the training videos of the American army used in the Second World War for repetitive tasks such as assembling a rifle could be presented (Rosemberg, 2001, p.20).

Unlike the *instructivists/behaviorists*, the theorists of *constructivism/cognitivism* are of the opinion that learning is an active process. *Constructivism/cognitivism* is based on the concept that students construct their own knowledge, rather than the idea that the teacher passes on information and knowledge to the students (see, for example, Piaget, 1952; Papert, 1993).

For the *constructivists/cognitivists*, the learning plan should always place emphasis on the student – rather than the content and format of the program – and on the instructor (University of Dayton, 2003). In this way, one progresses from a model in which the instructor is the center of the teaching program to a model in which the student is the center of same.

Assessment of Web-Based Corporate Training Programs

In many cases, the departments of a company need to develop corporate distance training programs via the web. More often than not, these programs are oriented by technical imperatives, namely the obligation to use Internet technology. In some organizations, the web-based training programs were designed specifically to justify the costs of the corporate intranet (Powell, 2000). However, the use of technology *per se* cannot be considered a justification for implementing any kind of training, as stated by Rosemberg, (2001), Bregman & Jacobson (2000), Bates (1995) and Kay *et al.* (1970), to name but a few.

In order to assess two web-based training programs conducted by the same company later in this work, with a view to establish what the critical success factors associated with these endeavors were, it is necessary to adopt a specific framework. In this paper, the model proposed by Reeves & Reeves (1997) will be applied to identify and evaluate the distinct dimensions involved in web-based training, as explained below. This model has applications in the research, implementation and evaluation of web-based training programs such as those analyzed in this paper.

It is important to stress that the model developed by Reeves & Reeves (1997) does not propose to evaluate either the outcome of a web-based training program, or its success or failure. Indeed, the overriding purpose of this model is to assess the different aspects and facets of this kind of program (Reeves, 1997).

The adopted model includes ten dimensions of interactive learning on the World Wide Web, namely: (1) pedagogical philosophy, (2) learning theory, (3) goal orientation, (4) task orientation, (5) source of motivation, (6) teacher role, (7) metacognitive support, (8) collaborative learning, (9) cultural sensitivity, and (10) structural flexibility.

Each of the ten dimensions in this model is presented as a two-ended *continuum* with contrasting values at either end, ranging from a fully aligned *instructivist/behaviorist* approach at one end of the spectrum to a fully aligned *constructivist/cognitivist* approach at the other. Needless to say, the world is rarely dichotomous and there is more complexity involved in training than any of these dimensions suggest. However, the individual dimensions themselves are not as important as the interplay among the ten dimensions that represent the major pedagogical approach of various web-

based training programs. These dimensions are detailed below.

a) Pedagogical Philosophy (Instructivist <=> Constructivist)

The debate over instructivist and constructivist approaches to teaching and learning persists to this day (Kafai & Resnick, 1996). Instructivists stress the importance of objectives that exist separately from the learner. Little emphasis is placed on learners themselves, who are viewed as passive recipients of instructions or treated as empty vessels to be filled with learning (Sherry, 1996). By contrast, constructivists emphasize the primacy of the learner's intentions, experience and cognitive strategies. According to constructivists, learners construct different cognitive structures based upon their previous knowledge and what they experience in different learning environments. It is of paramount importance for constructivists that learning environments be as rich and diverse as possible. Instead of an empty vessel, the learner is regarded as an individual replete with pre-existing motivations, experiences, aptitudes and knowledge. Tasks to be accomplished and problems to be solved must have personal relevance to the learner. The constructivists believe that what we know is constructed – both individually and socially – based on prior experience.

b) Learning Theory (Behavioral <=> Cognitive)

According to behaviorists, the critical factor in learning is observable behavior, and instruction involves shaping desirable behavior through the arrangement of stimuli, responses, feedback, and reinforcement. A stimulus is provided (e.g. a short presentation of content), then a response is elicited - often via a question. Feedback is given as to the accuracy of the response, and positive reinforcement is given for accurate responses. Inaccurate responses result in a repetition of the original stimulus, and the cycle begins again. Cognitive psychologists place more emphasis on internal mental states than on behavior. Cognitive taxonomy of internal learning states includes simple propositions, schema, rules, skills, mental models and so forth. They claim that a variety of strategies – including memorization, direct instruction, deduction, drill and practice, and induction - are required in any learning environment, depending upon the type of knowledge to be created by the learner.

c) Goal Orientation (Sharp <=> Broad)

The goals for education and training can range from sharply focused goals to general higher-order goals. Hence, the goal orientation of web-based training systems varies in degree of focus from sharp to broad (Cole, 1992).

d) Task Orientation (Academic <=> Authentic)

The context of learning is enormously important to adults (Merriam, 1993; Giardina *et al*., 2002). Academic design depends heavily on having the learners carry out traditional academic exercises, whereas authentic design engages adults in practical activities such as preparing job applications, thereby situating practice and feedback within realistic scenarios. If knowledge, skills, and attitudes are learned in a practical context, they will be used in that context in similar situations.

e) Source of Motivation (Extrinsic <=> Intrinsic)

Motivation is a primary factor in any theory or model of learning (Amabile, 1993). All new educational technology promises to be intrinsically motivating. This dimension ranges from extrinsic (i.e., outside the learning environment) to intrinsic (i.e., integral to the learning environment). Motivation instruction is intrinsically elusive,

irrespective of the delivery system.

f) Teacher Role (Didactic <=> Facilitative)

The teacher role continuum ranges from didactic to facilitative. In the former role, the teacher presents information and asks learners to memorize information and recall it later in tests. The latter role assigns cognitive responsibility to the learners, for them to be responsible for recognizing and judging patterns of information, organizing data, constructing alternative perspectives, and presenting new knowledge in meaningful ways, with the teachers being tutors of this process.

g) Metacognitive Support (Unsupported <=> Integrated)

Metacognition refers to a learner's awareness of objectives, ability to plan and evaluate learning strategies, and capacity to monitor progress and adjust learning behavior to accommodate needs (Flavell, 1979). The metacognitive support dimension is unsupported at one end of the continuum and integrated at the other. Recapitulation of the students' strategies at any point in the problem-solving process, as well as construction of web-based portfolios (Nevado *et al.*, 2004) are examples of how support for reflection and metacognition might be provided in web-based corporate training.

h) Collaborative Learning Strategies (Unsupported <=> Integral)

The Collaborative Learning dimension ranges from a complete lack of support for collaboration to the inclusion of collaborative learning as an integral feature. Cooperative and collaborative learning refers to instructional methods in which learners work together in pairs or small groups to accomplish shared goals (Kirschner *et al.*, 2004).

i) Cultural Sensitivity (Insensitive <=> Respectful)

All instructional systems have cultural implications. In an insensitive approach the training is developed irrespective of the culture and diversity of the learners it is intended to address. On the other hand, a respectful approach is based on the diversity in the populations in which the system will be used so that the overall learning environment is enhanced. It is unlikely that web-based training can be designed to adapt to every cultural norm, but sites should be designed to be as culturally sensitive as possible (Brown & Voltz, 2005).

j) Structural Flexibility (Fixed <=> Open)

"Fixed" systems, still dominant in education, are usually limited to specific places, e.g., a classroom or laboratory, at specific times, e.g., 50-minute class period. Irrespective of time and/or location constraints the learner can use "Open" systems. The World Wide Web provides opportunities for more asynchronous (open) learning, although some web-based learning tools are temporally fixed (synchronous), such as chats, video-conferences, etc.

Table 1 below depicts the ten dimensions defined for analyzing web-based training programs, as supported by Reeves & Reeves (1997). For each dimension (in the central column of the table), the opposite poles of the adopted ratio scale, ranging from 0 (a fully *instructivist/behaviorist* approach) to 10 (a fully *constructivist/cognitivist* approach) are described and their meanings explained.

RESEARCH METHOD

The multiple case study method as described by Yin (1994) was adopted in this research, in which two web-based distance-training programs developed within the same Brazilian company

Table 1. Dimensions to evaluate the characteristics of web-based distance training (Adapted from Martin, 1998 and Joia, 2001).

0 ←	Dimension	→10
Instructivist Knowledge is imparted by the instructor	**Pedagogical Philosophy** 0 - 10	**Constructivist** Knowledge is constructed – both individually and socially – by the students
Behavioral Emphasis on observable behavior	**Learning Theory** 0 - 10	**Cognitive** Emphasis on internal mental states
Sharp Direct instruction focusing on desired behavior	**Goal Orientation** 0 -10	**Broad** Simulations encompassing more than just a solution for the problem
Academic Emphasis on traditional academic exercises	**Task Orientation** 0 -10	**Authentic** Emphasis on practical activities
Extrinsic Motivation lies outside the learning environment	**Source of Motivation** 0 -10	**Intrinsic** Motivation lies in the student and the learning environment
Didactic The teacher is considered to be a knowledge repository	**Teacher Role** 0 -10	**Facilitative** The teacher is a mentor and tutor for the students
Unsupported There are no student progress tracking mechanisms or adjustments to individual needs	**Metacognitive Support** 0 -10	**Integrated** Student progress tracking mechanisms are implemented, as well as adjustments to individual needs
Unsupported Students work alone	**Collaborative Learning** 0 -10	**Integrated** Students work together in pairs or in small groups
Insensitive Training is prepared regardless of the culture and diversity of the learners it seeks to address	**Cultural Sensitivity** 0 -10	**Respectful** Training is based on the diversity of the populations where the system will be used
Fixed Program limited to specific places at specific times	**Structural Flexibility** 0 -10	**Open** Program independent of time and/or location constraints

were analyzed in-depth.

Case studies are particularly suitable for answering "how" and "why" questions, and are ideal for generating and building theory in an area where little data or theory exists (Yin, 1994), as in this knowledge field. It also enables researchers to use "controlled opportunism" to respond flexibly to new discoveries made while collecting new data (Eisenhardt, 1989), as was done and is presented below in this work.

Notwithstanding having a major exploratory facet, this study also presents explanatory characteristics, as a causal relationship between the dimensions of the programs analyzed (Reeves & Reeves, 1997) and the respective outcomes are pursued.

Yin (1994, p.46) argues that in the multiple case study method, each case must be carefully selected, so as to generate either similar or opposing results. In line with this, a Brazilian company was chosen (the identity of which is confidential) and two web-based training programs it developed and staged were selected, each one generating contrasting final results.

The first case – hereinafter referred to as "Program A" – was considered a success as it achieved its main objectives. The second case – hereinafter named "Program B" – developed by

the same company, was considered a failure, as most of its targets were not accomplished.

In order to validate the "Key Success Factors in Web-based Corporate Training" construct, multiple data sources were used, and also a chain of evidence related to research questions was pursued. The existing records associated with these projects were analyzed in depth. The managers of both programs were located in the company and submitted to open interviews in January 2006, in order to address their perceptions about the rate of success of the training programs they were in charge of. .There was a single manager for the first case ("Program A") and two managers for the second case ("Program B").

Questionnaires were prepared and circulated among the training users. These questionnaires were actually the Table 1 (Reeves & Reeves, 1997), whose dimensions were deeply explained to the respondents by the authors, in order they can rate them from 0 to 10, according to their perceptions associated with the training they were submitted to[1]. In addition to this, the users also revealed their perceptions about the rate of accomplishment of objectives of each program *vis-à-vis* the actual objectives proposed for the programs in their initial designs.

In line with the ideas proposed by Reeves & Reeves (1997) and, as already said, the minimum value of the scale (0) indicates that a dimension is fully aligned with the *instructivist/behaviorist* paradigm, whereas the maximum value of the same scale (10) proves that a dimension is fully aligned with the *constructivist/cognitivist* paradigm (Joia, 2001). Moreover, the maximum value of the scale (10) associated with the "Accomplishment of Training Objectives" indicates user perception of complete success for the training program, whereas the minimum value (0) points to user perception of total failure for the training program.

The aforementioned questionnaires were answered by all of the 32 users of the first case analyzed ("Program A") and all of the 31 users of the second case ("Program B"), during the course of January 2006. These trainings courses were chosen as the researchers had access to the students, as well as to most of the characteristics of the aforementioned training programs.

While having a clear exploratory approach, this work also addressed some explanatory elements used to verify the possible causal effects between the dimensions of the theoretical model and the training outcomes. This was done to support the internal validity of this research, in accordance with the recommendations of Morra & Friedlander (1999).

The first analysis conducted sought to compare user perceptions about the rate of accomplishment of objectives for the two programs, in order to verify whether or not the respective average of these grades could be considered statistically distinct.

Once the difference between user perceptions regarding the rate of accomplishment of objectives for each program was recorded, a statistical comparison of user perception averages associated with each dimension of the theoretical model applied was performed. Since it had already been seen that the two programs presented statistical differences with respect to their outcomes, namely success and failure, the dimensions that didn't present statistically significant differences within the two programs were discarded as not being critical success factors.

Thus, from this prior comparison, two dimensions of the Reeves & Reeves (1997) model were removed, leaving eight dimensions to be analyzed further. In order to achieve this, a multivariate linear regression was used, where the rate of accomplishment of training objectives was the dependent variable while the grades given by the users to each of the eight remaining dimensions of the model served as the independent variables.

In order to take the specificities of each training program into account, a dummy variable addressing the type of training program (TYPE) was adopted. For Program A, TYPE was considered 1, whereas for Program B, TYPE was made

equal to 0. Thus, the different values found for the intercepts of the linear regression indicated the difference between the programs, with Program B being considered as the baseline (Hair *et al.*, 1998, p. 167-168). The significance level of each coefficient associated with these dimensions (independent variables) was then calculated and analyzed, while the dimensions whose coefficients did not present evidence of linear correlation with the dependent variable (accomplishment of objectives) were discarded.

The above procedure highlighted three dimensions, which could be considered critical success factors for the training programs analyzed.

As a final quantitative validation, a simple linear regression with a dummy variable (TYPE) was performed on each dimension removed from the study for not being related to the accomplishment of training objectives. These simple regressions supported that these factors did not possess a fair linear correlation with the objectives of both training programs.

Lastly, another multivariate linear regression with a dummy variable (TYPE) was run, considering merely the three aforementioned dimensions as independent variables. The outcomes obtained supported the central importance of these three variables as critical success factors.

CASE DESCRIPTION

Internet Users and Web-Based Corporate Training in Brazil: An Outlook

Some developing countries, notably India, Mexico and Brazil, use Information Technology in a highly intensive manner. This fact alone might be construed as a decidedly positive opportunity for Internet-based initiatives. However, as these countries have large populations, absolute figures can lead the reader to draw mistaken conclusions. If, for instance, one compares Canada and Brazil, it can be seen that while Brazil has almost the same number of Internet users as Canada, nearly 50% of the population of the latter is digitally included (Joia, 2004), whereas less than 20% of the population of the former has Internet access according to the Brazilian Institute of Geography and Statistics (IBGE, 2005).

The number of Internet users in Brazil is estimated at around 32.1 million. This impressive number puts Brazil in first place in the ranking of Internet users in Latin America and fifth in the world. However, when comparing the number of users to the size of the population, the scenario alters considerably. It still represents a very small percentage of the total population of 187 million in a country with a GDP in the order of US$ 794 billion in 2007 (Afonso, 2001; Neri, 2003; IBGE, 2005; IBGE, 2007).

With 6 million lines in use (e-Marketer, 2007), Brazil is ranked third after the United States and Canada in terms of countries with broadband access in the Americas. Despite the still precarious conditions of technological infrastructure in many regions of the country, corporate training via the web in Brazil has been growing at an annual average rate of 15% per year, in terms of trained professionals (Bastos, 2003). This growth rate is undoubtedly due to the continental dimensions of the country (Bastos, 2003).

Recent research conducted in 120 major Brazilian companies has shown that 70% of them are in some way involved with the inclusion or practical application of e-learning solutions, even though the geographical distribution of these investments has unquestionable correlations with the regional socio-economic model and the consequent investment and income distribution indices of each of the regions analyzed (Bastos, 2003). This research has shown that not only does the Southeast Region have a greater concentration of companies already using e-learning (87%), but also that it serves the largest number of trainees online in Brazil (31%) (Bastos, 2003).

The Company

The company under analysis is a major Brazilian firm in the Information Technology industry. It has more than 30,000 employees with offices throughout Brazil. In 2003, the company posted total revenue of US$ 865 million and net income of US$ 76 million.

Due to its nationwide presence, this company faces an ongoing challenge to implement face-to-face corporate training programs, due to budget constraints. So, it is in this context that the two training programs, namely "Program A" and "Program B" were envisaged and implemented.

The name of the company, as well as further details about it, are kept confidential, as agreed with its top executives.

"Program A"

"Program A", considered a successful case by the company, is a mandatory corporate distance training program for all managers, namely its main target audience. Any employee who is promoted to a managerial function is obliged to take this course within a maximum timeframe of one year.

This training program lasts nine months and consists of three distinct stages that encompass distance and face-to-face training. The focus of this program lies in the development of leadership skills. Accordingly, the following issues are addressed: the attributes that make an effective leader; the different kinds of leadership styles that are best used under certain conditions; the various theories of leadership practice and the pros and cons of each; and the leadership responsibilities related to administrative and management tasks.

The training program is based on the premise that, rather than being an isolated event, learning is a continuous process throughout the professional's lifetime. "Program A" uses several Information Technology tools, such as intranet that is heavily deployed to provide information considered essential for the managers of the company.

Stage I of this program (Pre-Learning Laboratory) is developed on-line, in a distance-based training format. This stage lasts from five to six months and is an individual activity that demands between 48 and 56 hours of study.

Stage II of this program (Learning Laboratory) is a face-to-face experience lasting five days. The professionals must have successfully completed Stage I before embarking on this second stage. This Learning Laboratory takes place in the Global Learning Center of the company, in the city of São Paulo.

Stage III of this program (Post-Learning Laboratory), like Stage I, is developed on a distance-training basis. This stage focuses on collaborative learning via the company's intranet, as well as public forums and tools like instant messaging.

Throughout the duration of the course, a mediator is previously assigned and available to take part in the program, both in person and online, in order to resolve any doubts the professionals may have, to supply the students with suggestions, and to help them solve general problems.

According to an interview with the manager of "Program A", this program is considered a success, having fully achieved its targets.

Furthermore, thirty-two users of "Program A", who attended the program during 2005, answered the questionnaire developed for this research and evaluated their participation on this training program as a highly positive experience (average of 8.5 and standard deviation of 1.32 on a ratio scale ranging from 0 to 10). Therefore, it may be considered that the objectives were achieved. All of the thirty-two respondents were managers of the company.

"Program B"

"Program B" started at the beginning of 2004, initially as an effort to provide and make information about the company's productive and administrative processes available to employees located in the various offices of the company nationwide.

The design and development of the program was organized by the company's IT (Information Technology) team, supported by the basic premise of using the corporate intranet to publish all the content considered relevant.

The first version of the program gathered and consolidated the wealth of information about the company's processes already published in the intranet under a single site with a unique index for conducting searches. For this purpose, a team of five employees from two different business units was formed to assist the IT area in the identification and classification of information.

Once the information had been duly identified and classified, the IT area began to configure the program, so as to feature distinct courses categorized by subject. These courses could then be accessed by any employee via the intranet. Consequently, for each course implemented, a "Program Manager" was chosen to be in charge of developing the assessment questions (multiple-choice based), having privileged access to the answers given by the students.

After an initial test period – based on just one course developed for a specific group of employees – three distinct courses were made available – two of them focusing on specific working processes of the firm (Order Fulfillment and Customer Service), and the third addressing administrative content (Employee Performance Assessment and Promotion)

The main target of this training program was to reduce the costs involved in corporate training, as well as to speed up the adaptation and training time for newly hired professionals to become accustomed to the processes used by the organization.

After less than one year, having failed to achieve its objectives, the program was redesigned.

Thirty-one users of "Program B", who attended the program during 2005, answered the questionnaire distributed by the researcher. In essence, they evaluated the experience of taking part in this program as negative since the aims were not achieved (average of 4.52 and standard deviation of 1.15 on a ratio scale ranging from 0 to 10).

This evaluation from these employees tallied with the opinion of the program managers, as they stressed that the objectives of this program were not achieved.

COMPARISON OF RESULTS

Initially, it is necessary to analyze the differences singled out by both the program managers and users concerning the achievement of objectives of the training programs. According to the assessment of the manager of "Program A", the objectives of the training were fully achieved and in his general evaluation the program was rated as "very good". Conversely, the managers of "Program B" realized that the main targets of this program were not achieved, which led the program to be redesigned. Thus, according to the managers' perceptions, the difference related to achievement of objectives between the two programs becomes clear.

In order to analyze user perceptions related to the programs, it is necessary to evaluate the difference between the average grades given by the students to each one of the programs. The average user evaluation grade regarding the achievement of objectives in "Program A" was 8.50 (s=1.32; n=32, on a ratio scale of 0 to 10), whereas the same value concerning "Program B" was 4.52 (s=1.15; n=31; on a ratio scale of 0 to 10). This difference between the averages seems to tally with the opinion of the program managers. However, it is necessary to apply a statistical test (t-test) to compare the average of each program, so as to establish whether or not they can be considered different according to a statistical level of significance.

Table 2 below depicts the results accrued from the comparison of employee evaluation averages related to the achievement of objectives of the training programs.

Table 2. Comparison of Averages related to "Achievement of Objectives" according to the Users of the Training Programs

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed) (p)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Achievement of Objectives	.202	.655	12.752	61	.000	3.98	.31	3.36	4.61

From the results presented in Table 2, it is clear that there is a significant statistical difference between user perception averages related to the achievement of objectives of the training programs ($p < 5\%$). Furthermore, it can be observed that the interval of confidence doesn't encompass zero, i.e., it is all positive. Thus, it is possible to support with a 5% level of significance that the averages are different and the average of "Program A" is greater than the average of "Program B" (Sincich, 1995, p.532).

It can be argued that with respect to "Achievement of Objectives", "Program A" achieved better results than "Program B".

On the basis of this, the factors that influenced these results were researched, based on the theoretical model adopted in this article. Consequently, the evaluation averages of each dimension of the Reeves & Reeves' (1997) model were analyzed in order to find out which ones actually had an impact on the results depicted above.

Similarly, the dimensions that presented statistical significant differences in the sample averages for each program were examined, as these are the dimensions that can be considered to be influential in the achievement of objectives of each web-based corporate training program analyzed. Table 3 below compares the averages related to each dimension of the programs under analysis, according to the framework of Reeves & Reeves (1997).

As can be seen in Table 3 above, there is no difference in the Pedagogical Philosophy and Structural Flexibility dimensions in the two cases, with a 5% level of statistical significance ($p>0.05$). Hence, these dimensions can be disregarded as critical success factors in web-based corporate training. Based on this result, a multiple linear regression between the Achievement of Objectives (dependent variable) and the eight dimensions that presented significantly distinct averages (independent variables) was run, in addition to a dummy variable addressing the type of training program involved. The intention was to verify which variables could be considered truly influential in terms of outcomes achieved taking into account the different contexts of the programs.

Table 4 below depicts the summary of results and the statistical values accrued from this multiple regression with a dummy variable. As already said, the dummy variable TYPE was set up equal to 1 for the Program A and equal to 0 for Program B. This summary supports the validity of using the eight dimensions of the theoretical model (*Predictors*) to forecast the achievement of objectives for each case studied (in the summary, the "R" column represents the correlation coefficient and the "R Square" column represents the determination coefficient). From these data, it can be argued that nearly 72% (0.715) of the variance of the "Achievement of Objectives" variable can be explained by the dimensions included in this

Table 3. Comparison of the Averages of the Sample Dimensions of the Model

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Means Program A	Means Program B	95% Confidence Interval of the Difference	
								Lower	Upper
Pedagogical Philosophy	.010	.919	.511	61	.611	1.96	1.85	-.34	.56
Learning Theory	55.065	.000	2.470	61	.016	2.55.	2.03	.09	.94
Goal Orientation	4.285	.043	6.239	61	.000	2.94	1.58	.92	1.79
Task Orientation	16.813	.000	4.963	61	.000	3.03	2.00	.61	1.44
Source of Motivation	8.686	.005	4.951	61	.000	2.41	1.26	.68	1.61
Teacher Role	28.837	.000	6.790	61	.000	4.68	2.12	1.81	3.31
Metacognitive Support	68.946	.000	9.747	61	.000	3.00	1.06	1.54	2.33
Collaborative Learning	129.092	.000	3.760	61	.000	3.88	3.10	.37	1.20
Cultural Sensitivity	20.583	.000	7.756	61	.000	2.23	1.23	.74	1.26
Structural Flexibility	.943	.335	-.751	61	.455	2.69	2.88	-.71	.32

regression.

After validation of the model, an attempt was made to verify which coefficients, namely the dimensions of the model applied, actually influenced the achievement of objectives of web-based training programs. Table 5 below presents the summary of the statistics related to the coefficients of the regression model.

From the results depicted in Table 5, it can be deduced that, with a 5% level of significance, the Learning Theory, Task Orientation, Teacher Role, Collaborative Learning and Cultural Sensitivity dimensions did not reveal evidence of any statistically significant linear relationship with "Achievement of Objectives" (Sig. > .05). It can also be seen that the intercepts (b) related to training programs A and B are: $b^A = 4.960$ and $b^B = .687$, reinforcing the finding that the degree of accomplishment of objectives was greater in Program A than in Program B (4.273 points of difference)

In order to strengthen the results accrued from this multiple linear regression, with respect to the lack of evidence of any linear relationship of

Table 4. Summary of the Linear Regression

Model Summary (sample = 63 respondents; p-value=0.001)				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.868(a)	.724	.715	1.25
a Predictors: (Constant), Cultural Sensitivity, Learning Theory, Source of Motivation, Goal Orientation, Teacher Role, Task Orientation, Collaborative Learning, Metacognitive Support, TYPE (dummy variable)				

Table 5. Analysis of the Statistical Significance of the Coefficients of the Linear Regression of the Dimensions of the Model

Coefficients									
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Co-linearity Statistics	
Model	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Intercept) b[A]	4.960	.547		3.950	.000	2.998	6.657		
(Intercept) b[B]	.687	.356		5.980	.000	.289	1.567		
Learning Theory	-.0561	.298	-.019	-.254	.859	-.567	.490	.767	1.768
Goal Orientation	.511	.290	.256	2.334	.035	.076	.998	.589	1.978
Task Orientation	-.285	.299	-.098	-.901	.478	-.778	.312	.564	2.987
Source of Motivation	.878	.256	.402	4.342	.000	.489	1.876	.675	1.980
Teacher Role	.145	.15	.094	.855	.489	-.19	.334	.486	2.235
Metacognitive Support	.636	.256	.335	2.786	.007	.178	1.345	.345	2.678
Collaborative Learning	.190	.299	.093	.405	.770	-.556	.778	.556	2.123
Cultural Sensitivity	.290	.367	.089	.756	.478	-.489	1.098	.390	2.897

Dependent Variable: Achievement of Objectives

the Learning Theory, Task Orientation, Teacher Role, Collaborative Learning and Cultural Sensitivity variables and simple linear regressions with dummy variables of each of these variables *vis-à-vis* the "Achievement of Objectives" were performed. Table 6 presents the summary of the results accrued from these five simple regressions, which was drawn up separately from Table 5 to make it easier for the reader to fully understand the influence of each discarded dimension in the "Achievement of Objectives".

As can be observed from analysis of the correlation coefficient (column "R") and the determination coefficient (column "*R Square"*) of the five simple regressions, these variables did not effectively have any bearing on the "Achievement

Table 6. Summary of the Models of Simple Linear Regression of the Variables Discarded in the Multiple Linear Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1(a)	.245(a)	.060	.057	2.54
2(b)	.346(b)	.120	.118	2.90
3(c)	.456(c)	.198	.170	2.11
4(d)	.390(d)	.152	.120	2.34
5(e)	.399(e)	.159	.139	2.09

(a) Predictors: (Constant), Learning Theory, TYPE (dummy variable) (b) Predictors: (Constant), Collaborative Learning, TYPE (dummy variable) (c) Predictors: (Constant), Task Orientation, TYPE (dummy variable) (d) Predictors: (Constant), Teacher Role, TYPE (dummy variable) (e) Predictors: (Constant), Cultural Sensitivity, TYPE (dummy variable)

Table 7. Summary of the Linear Regression of the "Metacognitive Support", "Source of Motivation" and "Goal Orientation" Dimensions

Summary of the Regression (sample=63 respondents; p-value= 0.000)				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.851(a)	.724	.699	1.24

a Predictors: (Constant), Metacognitive Support, Source of Motivation, Goal Orientation, TYPE (dummy variable)

of Objectives" variable ("*Adjusted R Square"* smaller than 0.17).

Lastly, a final statistical analysis was performed. Analyzing the results of the multiple linear regression with dummy variables of the three variables selected as being influential in the achievement of objectives of the training programs – Goal Orientation, Source of Motivation and Metacognitive Support – it can be seen that this model is very similar to the former multiple regression model with dummy variables (Table 4) which took eight variables into consideration. Table 7 portrays a summary of this model. The intercepts are consequently: $b^A = 4.854$ and $b^B = .769$ (a difference of 4.085 points).

DISCUSSIONS

Despite the fact that distance education has been around for over a century (Matthews, 1999), the development of training programs has not achieved its full potential within organizations (Berge, 2002).

Different technologies have been used since the creation of the first distance training program, though web technology is considered a watershed in this realm. While the technological progress has been impressive, the implementation of web-based distance training has only increased at a slow pace. A survey conducted by the interactive magazine *Learning Decisions* (www.learningdecisions.com) in February 2000, based on 1902 respondents, revealed that only 22% of large US organizations were working on the development of web-based corporate distance training programs.

Besides the hype around Internet technology and its use in the business arena, the first trials using the Internet in corporate training arose at the end of the 20th century. However, most of these initial applications either failed or fell short of the expected outcomes (Cross, 2004).

For over a century, society has been trying to understand precisely how human beings learn. As with most problems in the social sciences, there is no single answer. However, it is clear that some rationale behind this research question must be developed. It must be remembered that western society (mainly the USA) has been heavily influenced by the *instructivist/behaviorist* paradigm, upon which its educational system was designed (Criswell, 2000).

On the basis of theoretical references and case research analysis, it became clear that the deployment of web-based training programs is not merely a technological issue. As in any training program, the inherent objectives and characteristics that it is seeking to achieve must be analyzed by the designers, so as to permit selection of the most adequate learning theory and define the instructional design, as well as develop and deploy the training program adequately.

Based on the comparison of averages, it was concluded with 5% level of statistical significance, that there was no difference between the Pedagogical Philosophy and Structural Flexibility dimensions in the two cases analyzed. The sample averages of the former dimension (1.96 for "Program A" and 1.85 for "Program B") indicate that

both programs were highly *instructivist/behaviorist*, namely most of the knowledge is imparted by the training, rather than constructed by the students themselves. In other words, most of the learners' prior experiences were not taken into consideration in either case. This tallies with some authors who reveal the hurdles in developing a *constructivist/cognitivist* web-based corporate training program in an environment where efficiency is pursued in order to be attained in a short time frame (see, for instance, Joia & Casado, 2007; Joia, 2001 and Criswell, 2000). Likewise, the sample averages of the latter dimension (2.69 for "Program A" and 2.88 for "Program B") pointed to the fact that "fixed" training programs are still dominant in corporate training, as in neither of the programs could the learners use the systems irrespective of time and/or location.

Thereafter, applying a linear multiple regression between the dimensions of the model developed by Reeves & Reeves (1997) and the achievement of objectives of both training programs, it can be seen that five out of the eight remaining dimensions of the theoretical model did not have a significant influence on the results of either program. Actually, the dimensions that effectively had a major impact on the outcomes of training programs A and B were: Goal Orientation, Source of Motivation and Metacognitive Support.

The low averages observed for the Goal Orientation dimension (2.94 for "Program A" and 1.58 for "Program B") indicate that the objectives of both programs were more specific than generic. However, it is important to note that "Program A" aimed at achieving somewhat higher-order goals (namely leadership skills) than "Program "B". Conversely, "Program B" set out to address sharply focused goals (namely the firm's processes). In other words, with respect to this dimension, "Program A" was less *instructivist/behaviorist* than "Program B".

This result duly corroborates the ideas of several authors who argue the need for a broader orientation for the success of a distance training program, i.e. one that elicits more than the mere solution of specific problems (see, for instance, Dick & Carey, 1996; Kay *et al*., 1970; Mager, 1972; Sancho, 1998, to name just a few).

"Program B" – with an average of 1.06 – had hardly any Metacognitive Support, whereas "Program A" – with an average of 3.00 – revealed a certain level of implementation of this dimension. Once again, based on data collected from informal interviews, the users of "Program B" declared that there was no tool for students to track their progression during this training program

Moreover, regarding Metacognitive Support, the actual description of the features available in "Program B" to students, from the program managers' perspective, namely access via the intranet and multiple choice questionnaires, reveals and supports the lack of means for users to assess their learning strategies in a timely manner.

On the other hand, "Program A" did indeed provide some opportunities for students to develop the kind of assessment addressed above. The tool upon which this program was built allowed the users to track their outcomes at each stage of training, as well as the percentage of total time available to complete the course, and the estimated total time necessary to accomplish each stage of the program. Furthermore, "Program A" allowed the students to check back on content they had already studied on the course, thereby enabling them to control their learning process, as suggested, for instance, by Nevado *et al*. (2004), Campbell *et al*. (2000) and Costa *et al*. (1998).

Lastly, "Program B" users' assessment concerning the Source of Motivation dimension produced an average of 1.26, indicating that the source of motivation was mostly extrinsic. On the other hand, in "Program A" (average of 2.41), it becomes clear that there was at least some prior intrinsic source of motivation during the training program *per se*, probably due to the fact that these employees had just been promoted to managers. Thus, it can be considered that more than being motivated by the course, the students were sup-

posed to be motivated by the company and their careers – a claim supported by interviews developed with five users of "Program A".

Conversely, the users of "Program B" did not appear to be motivated to take part in the training program, except for external motivation based on the mandatory nature of the program.

Interestingly, this result complies with the ideas of Carroll (1968), Amabile (1993) and Keller & Suzuki (2004) about the importance of taking intrinsic motivation into account in any pedagogical model.

FUTURE TRENDS

This chapter naturally does not claim to be the ultimate research in this knowledge field. The subject deserves a great deal more study and investigation. Research involving a larger number of companies and focusing on each specific dimension involved in the development of web-based distance training programs might reveal other important issues related to this realm, in order to allow the organizations to better understand, improve and measure the outcomes of these endeavors.

Furthermore, future research can verify whether there are differences between web-based corporate training programs conducted in developing countries (such as Brazil) and developed countries.

CONCLUSIONS

Hence, from the comparison of the two cases, the following items can be considered key success factors in these web-based training programs:

- Clear definition of training content, target employees and objectives of the program, seeking more than merely the solution of specific problems;
- Development of a source of intrinsic, as opposed to extrinsic motivation;
- Implementation of web-based metacognitive support.

The three key success factors accrued from the analysis of the results of this research *vis-à-vis* the theoretical background enable the selection of the learning theory and the technologies to be used in this endeavor.

It is interesting to note that according to Ertmer & Newby (1993) and Conole *et al.* (2004), the selection of a specific learning theory is not a key success factor by itself. Moreover, the realization that this dimension did not directly influence the outcomes accrued from selected programs A and B (as both presented *instructivist/behaviorist* characteristics) complies with Reeves' (1997) frame, as it does not support the allegation that an *instructivist/behaviorist* program is necessarily better than a *constructivist/cognitivist* one and *vice-versa*.

However, this is a point that must be the subject of in-depth investigation in future research addressing training in virtual environments. "Program A" presented a more *constructivist/cognitivist* approach than "Program B", as witnessed by the fact that the averages of the three relevant dimensions in the former program were higher than the corresponding dimensions in the latter program. This tallies with some authors who have argued that the *constructivist/cognitivist* approach is best suited for web-based distance training (see, for instance, Costa *et al*., 1998).

As with all research, this project has a few limitations that are duly set forth below.

First of all, the number of respondents – 32 users of "Program A" and 31 users of "Program B" – led to a sample size limitation, preventing the authors from running one multiple linear regression for each training program. According to Hair *et al*. (1998, p. 166), there should be at least 5 observations for each independent variable. As there were eight remaining variables, a sample of at least 40 respondents for each train-

ing program was required. Accordingly, a linear multiple regression adding a dummy variable for "Program A" and "Program B" had to be run. The outcomes of this latter regression have shown the difference between the degree of accomplishment of objectives of either program (Hair *et al.*, 1998, p. 167-168).

Moreover, as programs A and B are not exactly equal, some other factors associated with their corresponding content and *modus operandi*, just to name two aspects, can also have had an influence on their respective outcomes.

Furthermore, this paper attempted to establish the value perceptions of the employees regarding the outcomes of the two web-based training programs analyzed. There are some limitations in this approach, as some of the variables derived from the Reeves and Reeves (1999) model are not such simple variables as to be clearly understood by the respondents beyond all reasonable doubt, even after various meetings with the author. Indeed, a certain degree of subjectivity and bias from the employees may have occurred (Scandura & Williams, 2000).

Lastly, this is not a cross-cultural research project. Therefore the aspect of whether or not there is any influence accruing from the Brazilian setting in the outcomes of this research is not analyzed. The reason for this lies in the very fact that there are as yet very few works about web-based corporate training in Brazil in existence. In order that one can develop cross-cultural studies, it is important to have information about what is supposed to be compared. Thus, there is still much ground to be covered in this arena.

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Chapter 18
Web 2.0 Technologies:
Social Software Applied to Higher Education and Adult Learning

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ABSTRACT

Web 2.0 technologies are playing an important role in building social capital through increasing flows of information, and building on knowledge and human capacity of learning. The purpose of this chapter is to show the role that social software, a component of Web 2.0 technologies, can play in higher education and adult learning. This chapter focuses on the role of Web 2.0 technologies in promoting learning. New learning paradigms and pedagogical applications are also discussed.

INTRODUCTION

Education has traditionally been conducted face-to-face, with professors performing outstanding magisterial classes in front of the learners. During the centuries, students and professors have shared the same time and same space frame. Nowadays, things are quite different. Information technology (IT) is a reality affecting the whole education system from primary school to higher education and adult learning. IT is having a considerable impact on the learning providers, on the learning process itself and, of course, on any agent involved in the process.

History has demonstrated that technology affects education profoundly. Considering the definition of technology broadly, one may say that prehistoric people used primitive technologies to teach skills to their young (Frick, 1991). Whenever a new medium entered the picture, a new wave

of educational delivery arrived. Radio, television, and now computers have all impacted the field of distance education. Though some studies (see Russell, 1999) report no significant differences in performance between face-to-face instruction and technology supported environments.

Nowadays, campuses are networked, faculty post their notes on Web pages, students access the library from their rooms, and entire classes can have discussions via chat software (Rice-Lively, 2000). This development has recently come to be labeled under the by now commonly accepted term e-learning (Hudson, 2003).

The European e-Learning Action Plan 2001 (European Commission, 2001) defines e-learning as the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration. This requires new e-interaction and e-communication competencies and a reorganization of e-learning structures. Components can include content delivery in multiple formats, management of the learning, and a networked community of learners (Gunasekaran, McNeil, & Shaul, 2002). Internet/ World Wide Web have meant that opportunities have been identified for developing distance learning activity into a more advanced online environment. It is known as Virtual Learning Environment (VLE), which eliminate geographical barriers while providing increased convenience, flexibility, individualized learning, and feedback over traditional classroom (Kiser, 1999). Higher education institutions devote substantial resources to providing students with access to internet-based information, VLEs and other forms of e-learning. These efforts are predicated upon an assumption that "university students are inherently inclined towards using the internet as a source of information within their day-to-day lives and, it follows, disposed towards academic use of the internet" (Selwyn, 2008, p. 12).

But, today, the traditional approach to e-learning is currently changing from the use of Virtual Learning Environment (VLE) to e-learning 2.0, an approach that combines the use of complementary tools and Web services -such as blogs, wikis, trackback, podcasting, videoblogs, and other social networking tools- to support the creation of ad-hoc learning communities. In this context, most of the current research tends to be concerned with the potential of the worldwide Web and other internet applications to accelerate university students' learning and knowledge-building, and support interactivity, interaction and collaboration (Selwyn, 2008).

This proposal aims to provide an introductory perspective on the learning impacts of new media and Web 2.0 information and communication technologies on the e-learning environment. Web 2.0 technologies are playing a crucial role in building of social capital through increasing flows of information, and building on knowledge and human capacity for learning. Social software has emerged as a major component of the Web 2.0 technology movement. But, how can social software play a role in higher education and adult learning? To answer this question, this proposal will focus on the role of Web 2.0 technologies in promoting learning. Pedagogical applications, which stem from their affordance of collaborative knowledge discovery, will be discussed. At the same time the chapter will also explore the pedagogical methodology involved considering that e-learning Web 2.0 leads us from constructivism to navigationism. Finally, some suggestions are made for future research in this field.

BACKGROUND

Social Software and Web 2.0 Technologies as a Must for a Digital Life

The term social software is generally attributed to Tim O'Reilly. Social software includes a large number of tools used for online communication,

e.g. instant messaging, text chat, internet fora, Weblogs (or blogs for short), wikis, social network services, social guides, social bookmarking, social citations, social libraries and virtual worlds.

O'Reilly (2005) presented Web 2.0 as a second stage in the development of the Web. He describes Web 2.0 as an "architecture of participation'' where collective intelligence generates a ''network effect'' leading to Websites that become more valuable as more people participate (O'Reilly, 2003). For McGee and Begg (2008) "Web 2.0 represents a group of Web technologies with a user-centric focus that actively change and evolve with user participation" (p. 164). Web 2.0 is referred to as a technology (Franklin & Van Harmelen, 2007) and at the same time as a community-driven online platform or an attitude rather than technology (Downes, 2005).

Web 2.0 technologies are already having a significant impact on the way in which we communicate in both our personal and professional lives. Mejias (2005) wrote down a list of non-definitive kinds of social software applications, arranging technologies according to their social function (learning, selling, classifying, defining communities, and so on). Mejias (2005) stated that most social software products incorporate functions from more than one category and, also, most of them pose challenges to pedagogical approaches. And, these challenges are today instructors' challenges.

Organizational structures in the 21st century are also increasingly networked and with virtual teams becoming the norm. Virtual team working requires tools that enable the exchange of documents and information and collaborative creation. Wikis and blogs have taken relatively little time to become part of the suite of tools used for collaborative virtual projects. In this new organizational landscape, enterprise social or "collaborative software is probably the most visible current challenge. Interpersonal communication has become an integral part of the process of content creation, hence the value placed on communities

Table 1. Different types of social software and its applications

Social software	**Applications**
Multiplayer gaming environments	Multi-User Dungeons (MUDs), Massively-Multiplayer Online Games (MMOGs).
Discourse facilitation systems	Synchronous: instant messaging (IM) and chat (e.g. Windows® Live Messenger, AOL Instant Messenger, Yahoo® Instant Messenger, Google™ Chat, Skype™); chat. Asynchronous: e-mail, bulletin boards, discussion boards, moderated commenting systems (e.g. Slashdot)
Content management systems	Blogs, wikis, document management (e.g. Plone™) and, Web annotation utilities.
Product development systems	Especially for Open Source software (e.g. Sourceforge.net®, Libresource)
Peer-to-peer (P2P) file sharing systems	Napster®, Gnutella, BitTorrent™, eMule, iMesh
Selling/purchasing management systems	eBay™
Learning management systems (LMSs):	Blackboard, WebCT, Moodle
Relationship management systems	Friendster®, Orkut
Syndication systems	list-servs, RSS aggregators
Distributed classification systems	Flickr®, del.icio.us.

Source: Adapted from Mejias (2005). Work licensed under the Creative Commons Attribution-Non Commercial-No Derivs. License.

and networks" (Abell, Chapman, Phillips, Stewart & Ward, 2006, pp. 244-245).

Enterprise Social Software is a term describing social software in "enterprise" (business) contexts -definition provided by Wikipedia- [http://en.wikipedia.org/wiki/enterprise_social_software/]. It includes social and networked modifications to company intranets and other classic software platforms used by large companies to organize their communication'. Enterprise 2.0 is a paradigm shift. Organizations are increasingly focusing on leveraging internal information and on connecting people to people and people to content. Web 2.0 tools and techniques focus on collaboration and information/knowledge sharing. Business Information Survey explores the penetration of Web 2.0 tools. Results show that there is great strategic interest in social technology and Web 2.0 tools and techniques, but not much serious deployment yet (Foster, 2008). But, in our digital world, *digital natives* (Prensky, 2001) eagerly embrace social software developing the skills necessary to engage with social and technical change, and to continue learning throughout the rest of their lives..

As workers live Web 2.0 digital lives, organizations also will need to update their e-learning corporate practices. In that sense, Trondsen (2006) predicts strong uptake of virtual worlds in corporate learning and notes a number of pilot projects underway in company learning contexts. As students live Web 2.0 digital lives, instructors need to begin to deeply explore and develop new learning paradigms with these technologies and practices. And, finally, as the students of today grow into the leaders of tomorrow, they will bring these technologies into their organizations, making their use an essential part of the future of world of work and life-long learning.

Learning Paradigm Shifts

Since many years ago, different theories have been developed to explain how we learn. Behaviorism, cognitivism, and constructivism are the three broad learning theories most often utilized in the creation of learning environments. Neither of these views can be regarded as exclusively right or wrong. It is, however, necessary to know that constructivism is presently accepted as the most relevant of the three. In the pedagogical arena it is a must to analyze how these models allow instructors to create the circumstances best suited to facilitate student learning.

The first one, behaviorism, is a worldview that assumes a learner is essentially passive, responding to environmental stimuli. It stems from the work of Pavlov –the father of classical conditioning- and Skinner –the father of operant conditioning. Behavior theorists define learning as nothing more than the acquisition of new behavior. Learning is "any more o less permanent change in behaviour which is result of experience" (Borger & Seaborne, 1966, p.16). The behaviourist definition of learning focuses on the behavioural outcomes of learning, rather than on knowledge, attitudes and values.

After the behavioural theories came cognitive ones. The most influential theorists were Piaget and Vygotsky. Cognitivism theories seek to explain how the brain processes and stores new information. People are rational beings that require active participation in order to learn, and whose actions are a consequence of thinking. The learner is viewed as an information processor.

Constructivism as a paradigm posits that learning is an active, constructive process. According to a constructivist view, learning is seen as the individualized construction of meanings by the learner. The learner is an information constructor. Constructivist learning theories posit that knowledge is built by the learner, not supplied by the teacher (Piaget, 1967). People, by reflecting on their experiences, actively construct their own subjective representations of objective reality. Each of us generates our own mental models, which we use to make sense of our experiences. Learning, therefore, is simply the process of ad-

justing our mental models to accommodate new experiences.

In the present landscape of technological change, important transformations are underway in terms of how we teach and learn. There is a growing shift on the need to support the acquisition of knowledge and competencies to continue learning throughout life. "With respect to ICT, we are witnessing the rapid expansion and proliferation of technologies that are less about "narrowcasting", and more focussed on creating communities in which people come together to collaborate, learn and build knowledge" (McLoughlin & Lee, 2007, p. 664). So, constructivist approaches have grown to include social constructivism, which refers "to learning as the result of active participation in a community" where new meanings are co-constructed" (Brown, 2006, p. 111). Different learning strategies have been designed based on a community supported constructionist approach in which constructionism strategy –a strategy connected with experiential learning and based upon constructivist theories of learning- is situated in a supportive community context (Bruckman, 1998). This approach emphasizes the importance of social aspect of learning environment. The construction of new knowledge is the aim of these learning theories.

But beyond constructivism and social constructivism new paradigms are emerging. Brown (2006) focus on navigationism as the last learning paradigm shift. In this new learning paradigm the emphasis will be on knowledge navigation. Learning activities will be focused on exploring, connecting, evaluating, manipulating, integrating and navigating. Learning will take place when learners solve contextual real life problems through active engagement in problem-solving activities, and networking and collaboration. Siemens' principles of connectivism (Siemens, 2004) provides a summary of the connectivist learning skills required within a navigationist learning paradigm:

- Learning is a process of connecting specialized nodes or information sources.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision making is itself a learning process.

Connectivist learning skills are required to learn within a navigationist learning paradigm. And this is why Brown (2006) states that "connectivism is part and parcel of navigationism," (p. 117) a learning paradigm that needs further development. The main practical implication of Brown's work is that teachers and trainers should become coaches and mentors within the knowledge and digital era and learners should acquire navigating skills for a navigationist learning paradigm. To enhance e-learning Web 2.0 over time, it is vital for instructors to ground their designs on established learning theories and report how related learning experiences are integrated with Web 2.0 tools so instructors can determine what Web 2.0 tools have the greatest effect on learner motivation and performance. E-learning Web 2.0 is the key solution to equipping people with the evolving knowledge and skills that will be needed to adapt to the continuously changing nature of the information society. At the same time, the major aim in education is to produce autonomous learners. For Franklin and van Harmelen (2007, p. 21) "the growing Personal Learning Environment (PLE) movement has a significant Web 2.0 following which claims that PLEs are social software tools that help or enable learners to take control of their own education" and learning processes throughout their lives.

POSSIBILITIES AND APPLICATIONS OF WEB 2.O TOOLS

As Owen, Grant, Sayers, and Facer (2006) state "Web 2.0 will lead to e-Learning 2.0, to a rethinking of the relationship between technology and learning, to the development of educational practices that place the learner at their heart through the creation of collaborative, community-based learning experiences. To explore this further we touch now on the key theme of the potential shift in thinking from 'e-learning' to 'c-learning' (p. 10). Virtual communities of learning also offer the promise of bridging the worlds of work and education.

Some of the key attributes of social software in relation to education are that it (Owen et al., 2006): "Delivers communication between groups, enables communication between many people, provides gathering and sharing resources, delivers collaborative collecting and indexing of information, allows syndication and assists personalization of priorities, has new tools for knowledge aggregation and creation of new knowledge and, delivers to many platforms as is appropriate to the creator, recipient and context".

To help apply Web 2.0 to education McGee and Begg (2008, p. 167) summarize briefly the key differences between Web 1.0 and Web 2.0 (see Table 2). The new user-centered paradigm in which users are both producers and consumers of content and services has evolved from previous Web developments. The Web before the dot.com crash is usually referred to as Web 1.0. O'Reilly (2005) cites a number of examples of how Web 2.0 can be distinguished from Web 1.0, such as Web 1.0 was mainly a platform for information, but Web 2.0 is also a platform for participation. Web 1.0 tools can be used for the delivery of the course materials and for communication but Web 2.0 tools (such as blogs) can be integrated in a e-learning environment to a shift from a "knowledge transfer model" to a "knowledge construction model" as presented by Virkus (2008).

If one were to apply Web 2.0 concepts, "the lecture notes could become wikis (Wikipedia), the slides would become an image sharing collection (akin to Flick®), and students would subscribe to audio and video recordings (on a site like iTunes™), ideally all within an integrated ''virtual learning environment.'' This online environment would allow students to create their own views of their learning material and combine, with their own notes and external information resources. In Web 2.0 parlance this is a ''mash up,'' where content from different sources is combined by a user to create something new" (McGee & Begg, 2008, p. 167). Web 2.0 is suitable for educational and lifelong learning, because our knowledge society is built on digital environments of work and

Table 2. Comparison of characteristics of Web 1.0 versus Web 2.0 educational Websites

Web 1.0	Web 2.0
Course Websites using content management systems.	Faculty blogs, student discussion groups. Podcasts.
An expert (course director) produces a syllabus which resides on a curriculum Website.	Students in a course contribute to syllabus content with questions and answers to supplement expert materials.
Single Website, which displays the same content and design for all users.	Personal Websites, with customized data sources and layout for individual users
Posting problem based learning cases to a curriculum Website.	Small groups have their own Website to which they add learning objectives and educational content related to their coursework

Source: McGee and Begg (2008, p. 167)

social communication, and educational practices must foster a creative and collaborative engagement of learners with this digital environment in the learning process (Guntram, 2007, p. 17).

Table 3 summarizes some educational applications of Web 2.0 tools included in Franklin and Van Harmelen's (2007) work.

To embed Web 2.0 tools and processes within mainstream higher education practice the following need to be in place (Collis & Moonen, 2008, p. 100):

- Both instructors and students must value an educational approach where learner participation and contribution are balanced with acquisition.
- A pedagogical approach must be used that reflects contribution-oriented activities where students create some of their own learning resources.
- The approach must be scaffolded in practice by interlinked support resources for both instructors and students. Uncertainty must be reduced as much as possible for the students in terms of what is expected of them, and to what standard.
- The processes as well as the products produced by the students must be assessed as part of overall course assessment practices.

In higher education and adult learning educational applications of Web 2.0 tools add extra value to the learning experience and have an unlimited potential. So far, we have briefly summarized the increasingly varied ways in which these new tools can be used to construct the navigationist learning paradigm. This new learning paradigm 2.0 represents an opportunity to revolutionize the way human beings learn, interact, innovate and develop.

FUTURE TRENDS

Different subjects need to be explored in detail to step up research —educational, socio-economic and technological — in the field of e-learning 2.0 and in the use of Web 2.0 tools in higher education and adult learning.

- Special attention need to be devoted to using emerging technologies (GRID, Web 3.0) for the development of innovative applications for education and training. In this new technological environment, the question of how to motivate and socialize the student as an active learner needs also to be raised. As Hvid and Godsk (2006) state "e-learning platforms needs an aesthetic perspective instead of mainly addressing usability and function". (p. 210)
- In the near future, portable and personal technologies will offer new opportunities to connect people and to create new e-learning 2.0 environments. We are only beginning to understand the opportunities that mobiles technologies provide for learning. As Wilson (2006) points out "Web platforms that allow moblogging (blogging from mobile phones), vlogging (video blogging) and other forms of 3G-enabled participation are increasingly popular and show clearly the potential for user-generated 3G content to be integrated in an architecture of participation" (p. 239). Mobile technology will play a key role in the new e-learning 2.0 paradigm.
- e-Learning 2.0 indicators need to be further developed in order to monitor progress in the use of Web 2.0 in formal and informal education.
- Education methods, learning communities organization are essential aspects in this context.
- Research also needs to provide a holistic view of students' actual use of the social software in higher education and adult learning.

Table 3. Educational applications of Web 2.0

Web 2.0 tool	Description	Educational application
Blogs	A system that allows an author to publicly display time-ordered articles.	A blogger can build up a corpus of interrelated knowledge. Teachers can use a blog for course announcements, news and feedback. Blogs can be used with syndication technologies to enable groups of learners and teachers to easily keep track of new posts.
Wikis	A system that allows one or more people to build up a corpus of knowledge in a set of interlinked Web pages.	Wikis can be used for the creation of annotated reading lists by one or more teachers Wikis are suited to the incremental accretion of knowledge by a group, or production of collaboratively edited material.
Social bookmarking	It provides users the ability to record (bookmark) Web pages, and tag those records with significant words (tags) that describe the pages being recorded.	To build up collections of resources. Groups of users with a common interest can team together to use the same bookmarking service to bookmark items of common interest.
Media-sharing services	Sstore user-contributed media that allows users to search for and display content. Compelling examples include YouTube™ (movies), iTunes® (podcasts and vidcasts), Flickr® (photos), Slideshare (presentations), DeviantArt (art work) and Scribd (documents).	Podcasts can be used to record lectures Podcasts can be used to supply audio tutorial material Instructional videos and seminar records can be hosted on video sharing systems.
Social networking and social presence systems	Systems that allow people to network together for various purposes, such as Facebook© and MySpace® (for social networking / socialising), LinkedIn® (for professional networking), Second Life™ (virtual world) and Elgg (for knowledge accretion and learning).	LinkedIn® acts, at a professional level, as a model of educational use in the way in which it can be used to disseminate questions across the community for users seeking particular information. There are a wide variety of educational experiments being carried out in Second Life.
Collaborative editing tools	These allow users in different locations to collaboratively edit the same document at the same time, such as Google™ Docs & Spreadsheets.	For collaborative work over the Web.
Syndication and notification technologies	A world of newly added and updated shared content. A feed reader (or aggregator) is used to centralize all the recent changes in the sources of interest, and a user can easily use the reader/aggregator to view recent additions and changes. This relies on protocols called RSS (Really Simple Syndication) and Atom to list changes (these lists of changes are called feeds, giving rise to the name feed reader).	Feed Readers enable students and teachers to become aware of new blog posts in educational blogging scenarios, to track the use of tags in social bookmarking systems, to keep track of new shared media, and to be aware of current news

Source: Franklin & Van Harmelen (2007, pp. 5-7)

- Another key issue for any future research is to explore what forms of knowledge students obtain from social software and, most importantly, how students use such knowledge. In-depth qualitative research should be carried out to understand how is built through Web 2.0 technologies.
- The concept of virtual campus and virtual networks for cooperation and collaboration needs to be revisited.
- In the virtual world, social networking functions can enable learners to aggregate into communities of interest and evolve into communities of learning or practice.

We need to understand the formation of these communities and ways to facilitate the contribution of cybersocial networking to the learning and engagement of students and teachers (Computing Research Association, 2005).

- E-learning Web 2.0 may be able to reach learners who are disadvantaged by the digital divide. If it also important to define a research agenda which takes into account individual differences in learning, and special needs education to exploit the potential of Web 2.0 technology to provide remedial measures in the case of disability, exclusion, difficulty in gaining access to learning, or where conventional education does not work.
- Finally, special attention needs to be given to the promotion of gender equality in building e-learning 2.0 communities and social capital.

Bearing in mind all these agendas, e-learning 2.0 are likely to be a fertile research field.

CONCLUSION

Each new wave of technological innovation promises to revolutionize education, as we know it. The emergence of e-learning Web 2.0 is currently affecting most colleges, universities, and corporations. Now it is time to step back and question the pedagogical principles that inform our learning paradigms because Web 2.0 technologies have to be implemented taking into account pedagogical perspectives. The use of Web 2.0 technologies in higher education and adult learning is still a new technological phenomenon which will only "become valuable in education if learners and teachers can do something useful with it" (OECD, 2001, pp. 24-25).

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KEY TERMS

Collaborative Learning: An educational approach based the idea that learning is a naturally social act. The learner actively constructs knowledge by formulating ideas into words, and these ideas are built upon through reactions and responses of others. In other words, collaborative learning is not only active but also interactive. It is a student-centered approach in which social software tools are currently used for building and sharing knowledge.

Connectivism: A learning theory for the digital era. It is based upon the idea that knowledge is networked and so the act of learning takes place inside virtual networks and communities through social interaction. It is a networked model of learning.

E-Learning (electronic learning): Technology-supported learning and delivery of content via all electronic media. These may include Internet, intranets, computer-based technology, or interactive television. They may also include the use of e-technology to support traditional methods of learning, for example using electronic whiteboards or video conferencing. This terms covers a wide set of applications and processes, such as Web-based learning, computer-based learning, virtual classrooms, and digital collaboration.

Personal Learning Environments (PLE): A learning environment in which learners manage their own learning by selecting, integrating and using various software tools and services. It takes advantages of Web 2.0 affordances such as collaborative information and knowledge sharing.

Social Capital: A cross-disciplinary concept referring to the benefits of social networks and connections. Social capital is constructed and maintained in the interaction between individuals or groups. Social networks promote different types of social capital: bonding –referring to horizontal ties between individuals-, bridging – referring to ties that cut across different communities- or linking –referring to vertical ties.

Social Software: Software that allows the creation of communities and resources in which individuals come together to learn, collaborate and build knowledge. It is also known as Web 2.0 and it supports social interaction and collaborative learning. Current typical examples include Flickr® and YouTube™ –as audiovisual social software.

Virtual Learning Environments (VLE): A set of teaching and learning tools designed to enhance a student's learning experience by including computers and the Internet in the learning process. The principal components of a VLE package include curriculum mapping, student tracking, online support for both teacher and student, electronic communication, and Internet links to outside curriculum resources. There are a number of commercial VLE software packages available, including Blackboard, WebCT, Lotus® LearningSpace, and COSE.

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Chapter 19
Using Virtual Learning Environments to Present Different Learning Blends

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ABSTRACT

This work is concerned with the evolution of blended learning supports for university students in moving from early Virtual Learning Environment (VLE) platforms and supports that were designed and facilitated by academics to those platforms designed commercially (particularly Blackboard) and developed using a mixture of commercial, collaborative and e-learning supports. The chapter is an examination of a range of issues including production of learning resources and student learning approaches. It concludes by highlighting the importance of innovation and variety in the learning blend with increased reliance on digital collections and for learning approaches student experiences were evaluated as positive when undergoing problem-based approaches and were seen as stimulated to engage with e-learning materials based on the structure and operation of action learning sets.

INTRODUCTION

This chapter is concerned with providing a research perspective on the introduction, use and effectiveness of Virtual Learning Environments (VLEs), learning resource supports and experiences of applying these as blended learning supports for modules and programmes in universities. Some experiences of how student feedback can inform design of the learning blend and the effects on student learning experiences in business higher education are relayed, as they have developed in this millennium.

The objectives of the chapter are:

- To communicate case outlines of developments in digital information technologies for learning in Liverpool Business School, part of one of the UK's largest university's, Liverpool John Moores University, as a

means of exemplifying issues within the general sector. The target audience is digital information technologies (DIT) researchers, academics and practitioners (designers and architects of VLEs, resource material authors and online tutors).

- To illustrate the evolution and advances in technology commensurate with student needs over a period that has seen the transition from file servers, to web-platforms for student learning designed by academic staffs evolve to commercially designed web platforms.
- To use clear and current examples, case applications and illustrations throughout the chapter in an effort to tie the material to real world practice and thus provide interest and better understanding for the researcher and practitioner.
- To provide an outline of current research and thinking to enable holistic overviews of strategy, process and blend design for researchers and practitioners who work with digital information technologies.

The chapter contributes to a foundation for developing resources and implementing digital supports as they contribute to blended learning environments. It will demonstrate how academics and students behave, relate and learn in digital media and how instructors' can promote blended, problem-based and action-oriented learning. The work will outline the development of ICT-related knowledge as we have entered this millennium, to demonstrate how 'digital' learning processes and supports can be used to help academics and students meet the challenges of post-modern society characterised by norms, multi-tasking, resource developments, use of e-books and sustainability of the learning resource. The chapter presents a researcher with a range of currently used approaches in design; learning resource issues and learning approaches in the practice relating to Digital Information Technologies, which will be supported with theoretical underpinnings.

BACKGROUND

Problem-based approaches to learning (PBL) have a long history of advocating experience-based education. Psychological research and theory suggests that by having students learn through the experience of solving problems, they can learn both content and thinking strategies. The process requires that the teacher acts to facilitate the learning process rather than to provide knowledge. The goals of PBL include helping students develop flexible knowledge; effective problem-solving skills; self-directed learning skills; effective collaboration skills, and intrinsic motivation. There is considerable research on the first three goals of PBL but little on the last two. (Hmelo-Silver, 2004, p. 235)

Action learning approaches were originally proposed by Revans. There are various useful books, Revans (1983), but, like all powerful methods, the principle and the process are very simple and serve to direct the energy and expertise of the participants. The action learning approach is a process of disciplined small group discussion. The groups typically are no smaller than four members and no larger than seven members. Group members share a context; typically:

- They may come from the same type of organisation
- The material is always live and highly relevant to all concerned
- Action learning is learning from experience
- The group agrees to meet over a period of time
- The length of a session depends on the group size (the ideal size denoted by the project sponsors was seven and that number was used in this study)

The key aspects of the process are that each group member gets a period of strictly bounded time to discuss and present their company issues. Also the focus is on action – what he or she has done and will do – together with reflection on the action. Finally, group members, when they are not presenters, act as consultants, using the options listed above – empathy, listening, challenging, etc.

An excellent theoretical framework for interpreting the problem of adaptation for a changing environment, when developing learning and teaching with information and communication technologies, is presented by (Kirkwood and Price, 2006, p 3-4).They initially discuss Schön (1983), who argues that part of the reason that 'reforms' rarely reform, derives from the notion that knowledge is molecular: it can be built up from units of information that can be assembled together to form more complicated and advanced knowledge. This leads to a view that it is the business of teachers to communicate this knowledge and the business of students to receive or absorb this knowledge. This is not an outdated view (Kirkwood and Price, 2006, p. 2) also report Prosser *et al* (1994) found that university teachers hold a variety of conceptions of learning, and that some of the less sophisticated views encapsulate a transmissive conception of their teaching role. When ICT is adopted by teachers who hold such views of learning, their ICT practices are likely to reflect transmissive approaches that do little to reform or enhance students' experiences of learning, as noted by Sept (2004, p. 49). The architects of VLEs at the Liverpool JMU certainly followed the arguments of Schön, at the end of the 1990's, before the worldwide introduction of commercial VLEs such as Blackboard and Web Course Tools (WebCT).

Learning Resource Issues

Learning and Teaching at Liverpool Business School incorporates blended learning resources. Singh (2003, p.3) outlines this approach to supporting students as follows: Blended learning programs may include several forms of learning tools, such as real-time virtual/ collaboration software, self-paced Web-based courses, electronic performance support systems (EPSS) embedded within the job-task environment, and knowledge management systems. Blended learning mixes various event-based activities, including face-to-face classrooms, live e-learning, and self-paced learning. This often is a mix of traditional instructor-led training, synchronous online conferencing or training, asynchronous self-paced study, and structured on-the-job training from an experienced worker or mentor.

At Liverpool John Moores University (LJMU) expertise has been developed by staffs in Liverpool Business School (LBS) in the production of open learning text materials since the early 1990s; e-learning materials (2002-2004); on a regional university consortium project and in developing e-learning supports for courses and programmes in-house (2004). The resourcess have formed part of the blend offered by the School to student cohorts since the early 1990s. Towards the end of the 1990's many of the resources were made available through the commercial VLE Blackboard.

COMMERCIAL VLEs AND DEVELOPING LEARNING RESOURCES

Liverpool Business School within Liverpool JMU had for many years, prior to the introduction of VLEs into universities, been involved in producing open learning materials for national projects, which they had retained in electronic form. The staffs had also been involved in the Higher Education Funding Council initiatives of the mid-1990s to produce electronic resources, these were the Teaching and Learning Technology Projects (TLTPs). Wise (2005, p. 113) has said that in universities there is often clear recognition

for specialist research skills and outputs, but not necessarily so for equally specialized pedagogic skills and their many outputs. There appears to be little shared view about the range of expertise and costs in the current system for producing and disseminating printed learning materials. Funding for proper economic analysis, and also transition funding to help professionals innovate and transform their learning support practices, would be helpful. Funding to create fora where academics, librarians, publishers, and technologists can all come together to ensure that their objectives are aligned for the support of e-learning would also be extremely useful in breaking down traditional professional silos.

Hybrid Model Developed Across Universities

The experience and research and developments at Liverpool JMU enabled staffs participation on a UK Northwest university e-learning project. This consisted of a consortium management group arranging authorship of modules for an e-learning Masters in Enterprise (M.Ent.) programme to be delivered through the medium of Blackboard. The consortium commissioned approximately twenty-five academic authors from five regional universities (LJMU; Manchester Metropolitan; Salford; Central Lancashire and Bolton) to write e-learning materials. The aim of the programme was to support and provide e-mediated postgraduate study through flexible action learning and knowledge transfer to specifically serve employees of small to medium enterprises (SMEs) in the Northwest of England. The Northwest Development Agency (NWDA) funded the project. A total of twenty-one masters level modules were produced each of 20 Masters-level credits in size (corresponding to 200 learning hours). Issues surrounding this Hybrid model are outlined as: (i) The budget for production of electronic materials was £350,000; (ii) The platform for delivery within participant universities was to be Blackboard; (iii) The Action Learning model of delivery was to be used to complement learning materials. A series of aspects of development were observed. The positive aspects were collaboration between universities; peer reviewed learning materials; learning materials complemented by web-links guides; supporting documents; e-books and learning and teaching supports underpinned by a cross-institutional body of research. The negative aspects were the constraints of cross-institutional project management; tutor arrangements; exclusivity and intellectual property issues and the costs of production. The blend on the modules included problem-based and/or action learning and/or traditional teaching. The following was also facilitated through the Blackboard VLE at the university:

1. Electronic/paper based course outline and recommended texts.
2. A comprehensive electronic assignment guide and copies of excellent assignments.
3. Staffs contact details and an e-mail link.
4. Ten sets of electronic learning resources, additional electronic chapters from books,
5. Targeted electronic written materials all with copyright clearance.
6. A list of the ten topics covered in the module with hypertext links to: resource notes – PDF; lecture presentation – in PowerPoint, containing screen dumps from any commercial packages; workshop questions – Word/PDF; revision material – Word/PDF; individual learning resources – Word; and web links to support web sites; articles; e-books and on-line journals.

At Liverpool JMU equivalent supports were also provided for undergraduate modules using resources accumulated from earlier projects. General issues for the consortium centred around robustness of each university VLE; use of cross-institutional material; copyright and ownership issues. There were further institutional issues of

staff development for supporting students through use of VLEs

Up to the period 2002 there were rapid national developments in the use of web-templates and VLEs became commercially available to the UK higher education sector. Publishers, notably Pearson, Financial Times Management and McGraw-Hill, had exploited these developments and as part of a strategic move incorporated the production of web-supported programmes for Blackboard and WebCT (then a complementary commercial VLE) in order to offer bespoke modules or programmes to universities at commercial rates. In addition many publishers initiated e-book developments that could be accessed electronically and explicitly linked to VLEs. A facility was also made available to academic staff, in Liverpool, that enabled e-books to be tailored and constructed online to serve as module supports for students. The university adopted the McGraw-Hill model, primus, amongst others.

In-house Model Developed at Liverpool Business School (LBS)

In 2004 the LBS, within the university, developed an electronic and text-based version of the Masters in Business Studies (MBS). The authoring process differed slightly from the Hybrid model, in that here modules were written with strong reference to a focused textbook (referred to as a wraparound approach). The programme was offered by the School as a distance programme and marketed to a wider UK and overseas client base using various blended media. Twelve school academics contributed as authors of the module content on the project. The delivery of this programme (UK and overseas) occurred with the collaboration of a non-university intermediary agent that marketed and provided tutor-supports for the programme in several countries.

The production process for this project required budgetary controls, monitoring and planning with time constraints and targets, resulting in a twelve-month development period. The materials produced were also to be used in the School's MBA programme. Issues surrounding the in-house aspects are outlined as: (i) The budget for production of electronic materials was just over £30,000; (ii) The platform for delivery within participant universities was to be Blackboard. Local country agents had the option of offering text-based versions of the learning materials; (iii) A distance model combined with an essentially Problem-based Learning model of delivery was to be used to complement learning materials. A series of aspects were observed. The positive aspects were collaboration between Faculty academics using Faculty resources; peer reviewed learning materials; learning materials developed for part-time, full-time, distance and overseas students; resources complemented by web-links guides; supporting documents; e-books and learning and teaching supports underpinned by a cross-Faculty body of research for business students. The negative aspects – were the fact that the project was financed by the Faculty; remote tutor arrangements; problems associated with distance study/ students and lack of teaching supports. The blend of the modules, facilitated through the Blackboard VLE was the same as that outlined for the Hybrid model, only here wraparound texts and e-books were used more so.

Evaluation of Developments

The LBS at the university has undertaken several studies involving students that have used a VLE template (designed by academics) for a range of modules see (McClelland 2001a, pp107-115; 2001b, pp 2595-2600; 2002, pp154-159), they are summarised in Table 1.

As part of the overall studies of web-based learning in the Faculty a standard questionnaire (used within the university) has been developed and adapted by staff and used consistently as a vehicle to gauge student perceptions (complemented by qualitative information), in order to

refine the design and content of subsequent sites. Figures 1 and 2 show additional examples of course evaluation for undergraduate and postgraduates using multiple correspondence analysis (MCA). An interpretation for both MCA plots is provided in Table 2.

The goal of MCA is to describe the relationships between two or more nominal variables in a low-dimensional space containing the variable categories as well as the objects in those categories. Objects within the same category are plotted close to each other, whereas objects in different categories are plotted far apart. Each object is as close as possible to the category points for categories that contain that object. MCA can also be viewed as a principal components analysis of nominal data. The nominal data characteristics such as age group; course; mode of study; gender and communication approach concerning web-sites for postgraduate and undergraduate modules examined can be presented on plots in four quadrants when analysed (see Table 2).

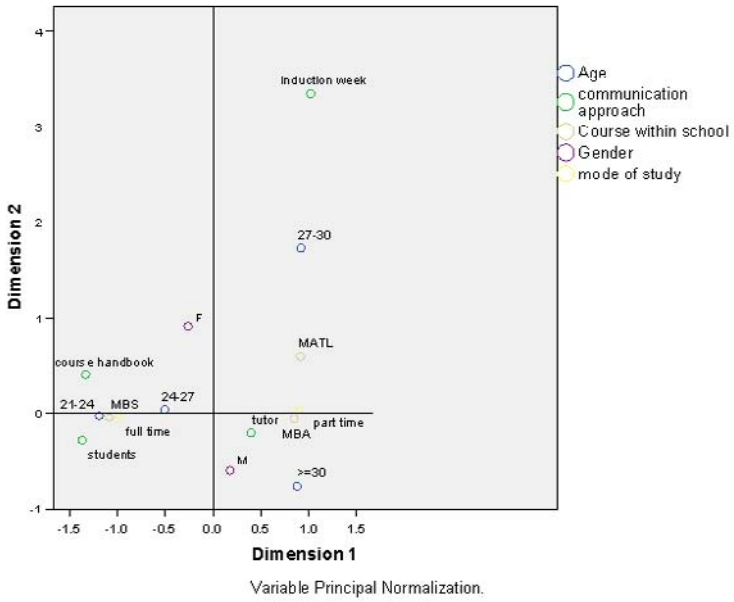
Table 1. Research Findings and Conclusions from a range of university surveys (©2007, Robert James McClelland. Used with permission)

Research Findings	Conclusions
Academic designed web-site supports enabled flexibility for both students and tutors, avoiding restrictions such as time, place and accessibility of knowledge supports. Students at lower levels of a programme used sites more frequently. Observed in time period 2001.	Restrictions such as time, place and accessibility of knowledge supports supported a continuous change model. Usage patterns indicate increasing usage of web-sites for less experienced learners.
Introduction of a commercial VLE, Blackboard, showed no major differences in student perceptions of quality, content, administration and learning experience than those experiences of academic designed web-sites. No differences in mean importance of all Blackboard site supports were observed when factored by the variable Student Learning Styles. Previous research on none Blackboard web-sites in time period 2001 had found one variance from this with External Links (exploring the web).	The no differences observation inferred continuous change from a simple to a more complex form. The Learning Styles observation inferred that Blackboard did not discriminate preferred learning styles of students and supports. This was a step improvement from observations on web-sites designed by academics. This was viewed as continuous change.
At LJMU the principles of clarity; attention; integrity and strategic use of informal information have been used in it's strategic transformational change processes due to a combination of consistent information flows; a series of targeted internal studies; a focus of all communications supporting organisational objectives and through the transparency of the transformation process, and wide involvement of staff, strategic use has been made of informal information. Time periods 2000 & 2001	Action and communication was developmental rather than seen as major changes. The communication within LJMU was to effect change and influence action in the direction of the university's overall interest.
Almost 1000 LJMU students responded to a survey of Blackboard use (n = 900), 50% stated that all or most of their module leaders employed use of Blackboard. 71% indicated that they would like it used for more of their modules. There is evidence that Blackboard had a role to play in widening participation. Majority of staff and students viewed Blackboard as having great potential in enhancing and supporting learning but acknowledged that it needed to be exploited much more. Time period 2002	Uptake was gradual in the transition from LJMU supported and academic designed web-provision, but greater than that previously experienced. There was a wider acceptance and greater perceived benefits. Awareness was widened and initiatives developed. The changes were developmental and not fundamental complete changes. Time periods 2001 & 2002
In a case study on Edith Cowan University's introduction of Blackboard (Australia) the lessons that were taken on board were 'establishing a clear relationship between institutional strategy for online learning and the platform selection process; mapping the necessary links between the platform and existing in-house information technology and the value of active engagement and support for one learning platform, whilst other systems were allowed where local markets dictated.' (The Observatory On borderless Higher Education, 2002).	Research supported LJMU experience of internal monitoring, evaluation and consultation processes, but focusing and supporting one VLE platform whilst allowing flexibility. Research endorsed incremental changes.

Table 2. Explanations of the four quadrants for multiple correspondence analysis (©2007, Robert James McClelland. Used with permission)

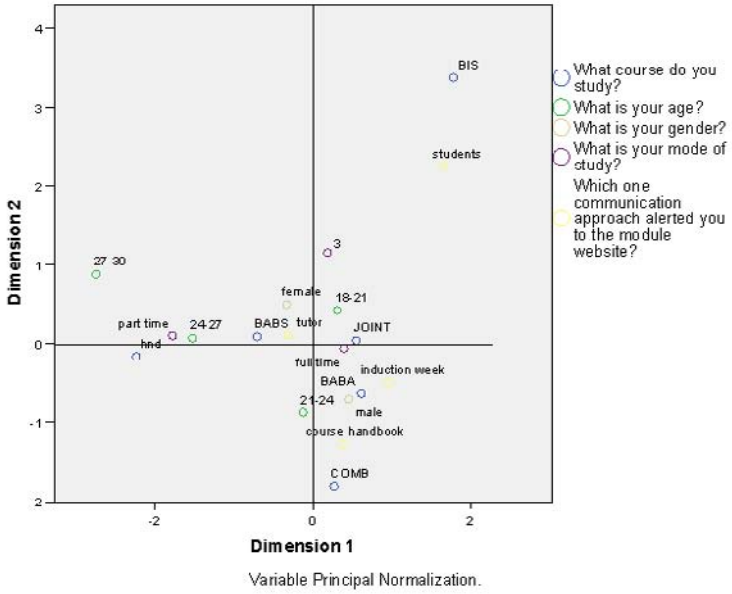
Type of Student	Top left quadrant	Bottom left quadrant	Top right quadrant	Bottom right quadrant
Postgraduate	Use of course handbook is closely related to Females in the 24-27 age group	Full–time students on the Masters in Business Studies course and in the 21-24 age group are closely related	The induction week communication is closely related to the 27-30 age group and Masters in Leisure and Tourism course	Use of a tutor for communication on the Masters in Business Administration course is closely related to Males in the above 30 age group
Undergraduate	The tutor communication approach was closely related to Female students on the Business Studies course who are part-time and between the ages of 24-27 and 27-30.	The Business Diploma course (hnd) is closely related to the 21-24 age group	The student communication approach is closely related to students on the Business Information and Joint degree courses who are between the ages 18-21	Induction week and course handbook communication were closely related to Male students who were full-time on the Business Administration Degree

Figure 1. Multiple correspondence analysis plot for postgraduate course resources (©2007, Robert James McClelland. Used with permission)



The course handbooks used in the MCA studies were both electronic as well as hardcopy and it is interesting to note that male undergraduates initially rely on course handbooks as a communication approach whereas the trend is for females to have this approach on postgraduate courses (Figure 2). A contrasting trend is also observed for males and tutor communication on postgraduate courses, whereas the trend is for females and

Figure 2. Multiple correspondence analysis plot for undergraduate course resources (©2007, Robert James McClelland. Used with permission)



tutor communication on undergraduate courses. (Figure 1).

The positive and negative aspects of in-house production models and outsourced production models at University College London (UCL) have also been the subject of research by Secker & Plewes (2002). Generally, the costs attached to developments of resource-based learning materials vary from project to project and period to period, as do the technical specifications. The costs per credit for production for postgraduate and undergraduate resources in different time frames for developments in the LBS at Liverpool JMU have seen a reduction by almost fifty percent in eight years (Bachelors degrees costing on average £1,000 per credit to produce between 1992-96 and Masters Degrees costing on average £500 per credit to produce in 2004).

The term electronic study pack has been used in reference to a set of core readings in digital format that are specific to one particular course (*ibid,* p. 102*)*, however, in the examples discussed here, both models have built in flexibility, in that the electronic modules have been developed as units (in all cases each module consisted of ten units). This unit-based construction provides for flexibility as modules can be deconstructed into separate units and reconstructed to provide for different, or more tailored modules and subsequently variable business programmes. The number of units existing for modules developed in the School to date is 360 for Business Bachelor Degrees (36 modules) and 300 for Business Masters Degrees (30 modules).

The learning blend in both Hybrid and In-house models was innovative in the emphases placed on use of tailored media, e-learning materials as well as e-books, (McClelland & Hawkins, 2005, pp 156-157).

COMMERCIAL VLEs AND STUDENT LEARNING APPROACHES

With the VLE Blackboard embedded as a university wide learning support at LJMU, and ongoing evaluations being undertaken that take on board architectural considerations, there existed opportunities to trial a range of learning approaches supported through e-learning. Since the early 1990's the LBS had provided students with a range of blended learning approaches based on standard models, (Singh, 2003, p. 52; Osguthorpe & Graham, 2003, pp 228-229). This included adapted approaches to learning including problem-based learning and action learning.

Problem-Based Learning and Blended Supports

Problem-based approaches have been used in LBS based on the premise of Boud (1985, p. 13) who has said: "The principal idea behind problem-based learning is that the starting point for learning should be a problem, a query or puzzle that the learner wishes to solve." The approach has found wide application in Engineering, Medicine and Law undergraduate and graduate programmes, it has found growing application in Business and in LBS has leant itself to subjects such as Database Development, Marketing Research Methods and Research Methods. In LBS two subject areas that were consistently evaluated using this problem-based approach with e-learning supports in the blend, they were the undergraduate module Market Research Methods and the postgraduate module Research Methods. Evaluation outcomes of these modules, moving from supports in the blend, using academic designed e-learning templates, to supports using commercially designed e-learning templates, can be seen in Table 1.

Action Learning and Blended Supports

The idea for evaluating action learning on a Masters in Enterprise at LBS came originally from the UK Northwest university consortium e-learning project. Liverpool JMU was a member of this consortium. The aim of the Masters programme was to support and provide e-mediated postgraduate study through flexible action learning sets and delivery patterns, knowledge transfer supported by electronic module resources in order to specifically serve employees of Small to Medium Enterprises (SMEs) in the Northwest of England. In 2004 the NWDA funded a further regional project group called NetworkingNorthwest to facilitate five action learning (AL) projects for delivery to Northwest enterprises. Five universities were successful in bidding for the project monies to deliver the action learning (Liverpool JMU was one of the successful bid teams) and an action learning research group from Leeds University was appointed to evaluate the resultant five pilot projects. Howell (1994, p.20) had observed that "action learning and action research have become popular among managers and their sponsors from a variety of academic and business backgrounds because these programmes are work-related, results-based, group-focused and appropriate to the preferred learning styles of these managers."

Framework and Background to an Action Learning Research Study at Liverpool JMU

(McClelland, 2006, p. 58) reported that students on the pilot programme at Liverpool JMU studied three modules, they provided stage-one of a Masters programme, this is a free-standing qualification (postgraduate certificate in Enterprise).

The blend of the modules supported through a VLE was the same as that outlined for the Hy-

brid Model, only here action learning sets were used. The Masters in Enterprise Programme was launched in January 2004. This is the only Programme of its type in the UK, hailed as innovative by the UK government commissioned research (Lambert Review, 2003, p115). The programme was designed to offer an action learning approach in order to help small and medium sized businesses (SMEs) learn better for enterprise. A regional research award was received to study the action learning sets that supported modules of the programme for the first cohort of students enrolled. There was a prescribed framework suggested by the NetworkingNorthwest group who directed the generic approach to research projects. The projects constituted a one-year pilot study. The framework specified the following: (i) There must be one AL set per month for 12 months for each subject module studied; (ii) Each AL set must consist of seven members (and they must be managers or owners of their respective SMEs); (iii) Each set member must provide appropriate data concerning their organisations (in order to construct the measure Gross Value Added or GVA); (iv) Each set must have an academic facilitator and recorder for each session.

The pilot M.Ent cohort in Liverpool JMU consisted of twenty-one students studying three modules (stage one of the Masters), this was known as the group. The group was split into action learning sets that numbered seven in size. All twenty-one students in the group were female entrepreneurs that were nominated by a women's support agency Train 2000 based in Liverpool. Seventy five percent of the group came from micro businesses (that is less than ten employees). This was an important consideration for this first cohort as the funding streams for SME development in the region (especially for this pilot project) emphasised the need to engage micro businesses. The gender focus was also attractive to the funders. Noteably Anderson (2004) has reported: "some senior managers did not have a positive attitude to women managers and there was a sense that, being women only, the course did not have the kudos that a mixed course would have had." (p. 738). There are three subjects on the stage one of the Masters (postgraduate certificate stage), two of these are core and each being 20 M-Level credits in size (equivalent to 200 learning hours at Masters Level). The subject disciplines formed the focus for action learning sets and the three subjects studied were:

- Research for Enterprise, a core subject for the postgraduate certificate stage
- Creative Problem Solving, the second core module required
- Project Management, an option that was based on student selection

At the interview stage the Project Management module was elected most popular option to study by successful student candidates. Within the group of students (subsequently split to three AL sets of seven) the organisational profiles were as follows: two members from Social Enterprises (Health Area); A Beautician/holistic therapist business; four members from HR consultancies; A Management Development Consultancy; A Kennels/Stables business; A Photographic Agency; A Promotions and Marketing Consulting Agency; An Acting Agency; An Internet Cafe, bistro, Art business; A large city Chamber of Commerce (marketing); A Training Agency; A local Building business; An Interior design and furnishing manufacturer, two members of Project groups (semi-charitable); A Business and Accounts Advisory company and a Web based Restaurant/ Food consultancy.

All set members were senior managers that owned companies or were senior managers in the companies.

The three AL sets (A, B and C) were formed based upon company context in action, for example, set A consisted of a range of managers/owners that included: A Training Agency; Promotions and Marketing Consulting Agency; An Internet Cafe,

bistro, Art business; The Liverpool Chamber of Commerce; A Project Group (semi-charitable); A Management Development Consultancy and a HR consultancy.

Group members shared a context; typically:

- The set students came from similar types of organisation
- The material was always 'live' and highly relevant to all concerned
- There were excellent learning resources fully presented on Blackboard (an earlier £0.4million development of twenty-one subjects)
- Action learning was learning from experiences of set members
- The group agreed to meet over a period of time – on the framework this was once per month per subject
- Three group sessions occurred each month (one for each subject)
- The length of a session depended on the group size: on the M:Ent it is three hours
- Twelve sessions ran for each subject over a period of one year
- Assessments, if they were taken up, consisted of a 5000 word assignments (individual consultancy in the subject areas, for participants own organisations)
- Assessments were optional and each of the subject modules stood as a qualification in its own right (a Certificate in Professional Development or CPD).

The key aspects of the process model for modules on the M:Ent were that: each group member had a period of strictly bounded time to discuss and record their issues that they keep for reflection in their set (with six other students); the focus was on action – what she had done and intended to do – together with reflection on the action; the set members presented a set feedback for facilitators, when they were not completing their own and the group (consisting of the three sets) received a formal academic input based upon requests and feedback from previous sessions.

Each of the sets had a Facilitator (subject specialist) whose role was to manage the time boundaries, negotiate and maintain the contract (timing, confidentiality etc). The role differed from that of a committee chair, seminar leader, supervisor or mentor. Some groups (not this particular M:Ent. group) can be self-facilitating (members take turns at this role as they take turns to be presenter).

Each of the sets had an independent Recorder (subject specific-developed and receiving training by the regional evaluators of the project) that recorded the set discussion and collected the set group feedback (there were three in total, one each for each of the sets A, B and C, that occurred once per month). The session activities were transcribed by recorders and formed the basis of qualitative data for evaluation, addressing action learning issues for each of the three subjects and feeding back into the delivery pattern. An inductive approach to key issue identification and collating quotes from voices was employed, facilitated by the use of NVivo (version 2) computer aided qualitative analysis software.

On the M.Ent project the team attempted to follow the model process of Revan's Classical Principles (RCP), see Revans (1983), whilst giving the model a new emphasis on management skills and inter-group relations the 'set', whilst supporting the group and sets with e-learning materials, freeing up the sessions to allow members to focus on inquiry, reflection, review and planning.

Results of the Action Learning Approach at Liverpool JMU

What follows are accounts (triangulated) of the experience at points in and after thirty-seven contact sessions and reflections on them (in true action learning style). The author hopes that the anonymous accounts will exemplify the approach and encourage others to attempt this action.

At induction students were asked what attracted to the programme, all voices from the cohort contributed to the list as follows: Enterprise focused; Women only (this cohort); Supported on-line; Flexible; New course; "Bit of a buzz"; Free of charge.

The cohort was also asked of their expectations of the university. The responses were what you would expect from most students with all voices concluding: "Support process, learning, access to resources, support for their businesses, better understanding of issues, motivation when feeling disheartened, to be kept informed." The drivers for taking up the subjects offered were not therefore to gain qualifications but its flexibility, use of technology, access to resources and a means by which they might obtain drive and improve their businesses.

A feedback session occurred at a point eight months into the one-year pilot programme with all students (excluding those who had withdrawn). The students (who were now experienced in action learning approaches) were asked to brainstorm what they felt about the programme. The presentation approach they took was to tell a story. The following is a recorded summary of a presentation from six voices in set A.

The story portrayed the group members as maidens, who were all working on their own, and were having problems. A fairy princess from Train 2000 (the agency originally forwarding students) pointed them in the direction of the M:Ent that could solve their problems, because it would allow them to share their worries with others who were going through the same problems. The leader of the M.Ent project was portrayed in the tale as "Bob the Business Builder" – a wizard! The story describes the maiden's woes and how their interactions and shared views of problems, as well as the time taken out from their busy working lives, has helped them to see the light and to make a more informed judgement of their situation. The story ends with maidens not only living happily ever after, but being transformed into "professional business women who could now be confident.

This story is self-interpreting and highlights how there had been growth and bonding into a cohesive group with common goals. At this stage there was a realisation of learning achieved and programme outcomes.

All students discussed some of the skills that they had acquired over the previous eight months,

Table 4. Some observations on the action learning process for different modules (©2007, Robert James McClelland. Used with permission)

Module	Collective Voices (Mapping)	Voices General
Creative Problem Solving	*"Targeted marketing; Intranet/internet web design; Group problem solving; Stakeholder analysis; Rational decision making and Organisational learning"*	One voice (M) talked about trying to be *"all things to all people" at the beginning of a company's life.*
Project Management	"*Management of risk; Planning – realistic milestones; Microsoft Project; Critical path issues and Lifecycle issues".*	One voice (P) suggested: *"carrying out regular reviews, monitoring and evaluating projects effectively is an important lesson, although this is potentially difficult within small organisations".*
Research for Enterprise	"*Importance of research philosophy; Need for qualitative & quantitative data; Primary & secondary data needs; Online information resources; Data analysis using SPSS and Questionnaire design".*	Recorder observation (B) *"When faced with "real" problems the group approached them with confidence and professionalism. The M:Ent students surprised themselves as to how much they did know and how much useful advice they were able to give the undergraduates".*

as a result of this project. Primarily the collective voices identified time management and information management skills.

Reflecting on their experiences over the previous eight months all voices reported: "we feel that the attendance at the M:Ent and interaction with other women in our positions has allowed us to take a different angle on our work, develop our own personal skills and highlight areas that need improvement."

The programme seemingly met a gap that the students' felt existed in their businesses. In addressing how the course had addressed changes to the individuals and their businesses the group analysed the three modules that had made up the M.Ent to the eight month point in the course, in order to reflect on the impact that individual aspects of each module had on their working lives. They plotted their analysis on a flip chart pad in order to map out the interaction of their learning from the three modules. Some observations on this and other general comments are identified in Table 4.

The recorder observation in Table 4 identified a rites of passage exercise that was timed to develop consultancy skills within the group (many of whom practice as consultants in their own work environments). This enabled enhancement of that understanding, to become better able to act on the world.

RESULTS

Feedback from the students, recorders, facilitators and evaluators attached to the LJMU pilot study students certainly endorsed the collaborative approach of action learning as well as the e-learning approach. Observations in McClelland (2006) from the facilitators and recorders on programme team include the following results concerning the framework used on the pilot programme:

- Feedback from students throughout the programme was positive. Eighteen students from the original cohort completed the programme (86%). As a cohort that attended in part-time study mode, attendance records were high at each session. It was interesting to note that all students applied the learning in their workplace environments and fed the outcomes of the application into the action learning sets. The action; review; planning; action was therefore seen to be enhancing their understanding, to be better able to act on the world.
- Students gel in action learning sets – A series of post session meetings (formal and informal) were organised by the groups to extend networking and learning. Many collaborated and helped each other on real-life work projects (especially the consultants within sets).
- Networking occurs within and across sets – The structure of the programme was such that lunches were facilitated, buffets as well as a social event in a December review meeting. This created an excellent support for social networking across the sets. Formal sessions and electronic networking was also well developed within the sets.
- Students engage with the learning materials - Irrespective of the flexibility concerning their use the structure and operation of sets did stimulate students to engage with the learning materials provided (on a Blackboard web site). This was evidenced in their continued questioning surrounding the content of the learning supports within sessions, (especially in Research for Enterprise and Project Management modules).
- Students own their own learning and its process – Although the framework of the modules dictated the academic disciplines to be followed and the learning supports provided, students did request specific inputs and emphases for the sets and workshops that

supported skill development. In a true open learning approach students could also make decisions about whether or not to engage in an assessment process. This flexibility removed many barriers (such as meeting academic deadlines, academic writing and balancing workplace and academic pressures).

- Action learning components were manifested on this pilot programme, in that the problems/issue were identified; there was questioning and listening in every session; there was a focus throughout the programme on learning for business development; there was a series of commitments to take action for the range of businesses represented on the programme; there was action learning coaching presented throughout the programme by facilitators and there were established learning teams formed as part of the programme.

FUTURE TRENDS

Jennings (2005, p.166) has said something that is certainly the observation at Liverpool JMU "It is apparent that the majority of Blackboard users in University College Dublin (UCD) is only just beginning to tap into the potential on offer, and they are using the system as an effective means of delivering and managing an array of multimedia content. Our VLE has become a Course Management System (CMS). As time goes on users will become more familiar with the tools and attempt to blend them into the day-to-day process of teaching and learning. However, those that are already familiar have begun to look elsewhere to enhance the environment by including outside sources of interactivity in the guise of digital video or Flash files"

(Roberts *et al*, 2005, p. 10) outline the challenges and opportunities for informal learning in ubiquitous computing environments can be thought of involving three interrelated aspects, namely: Educational Environment; Personal Environment; Technical/Computing Environment

Formal to informal learning is a continuum: at the formal extreme all control over the learning process lies with the tutor and at the informal extreme the control over the learning process lies with learner.

(Richardson & Watts, 2005, p. 118) highlight that with widening internet access, life long learning and increasing numbers of mature, distance and disabled learners, electronic education has to grow. Use of web-based learning and in particular the feedback obtainable from formative assessment, such as quizzes in WebCT, will help develop the confidence of the returning learner. WebCT is a good vehicle for the delivery of a course at a remote study centre, for example, to support a franchised network of colleges. With the increase of student numbers wishing to study at their local college, this provides better access to higher education.

Interestingly (Huang & Luce, 2004, pp. 533-534) showed that 50% of surveyed MBA students agreed they learned more from the MBA largely supported by a VLE than one only supported by a Traditional Learning Environment (TLE), whereas 12.5% disagreed 37.5% felt no difference between the two teaching modes. In summary they (*ibid.*) concluded that:

- Due to the key advantages of MBA program supported by VLE such as convenience and more interesting, there should be a good market potential for MBA program in VLE to grow in the future.
- Incorporating suitable teaching modes in VLE is the key for the success of online MBA programs. A combined teaching mode of VLE and TLE can be a good choice.
- Those online MBA programs or other programs that have had difficulties in keeping a high level of teaching quality and students' satisfaction may need to consider revising there teaching mode by combining both VLE and TLE teaching modes.

This blend, recommended through research at Ohio University, is mirrored in many of the postgraduate programmes at Liverpool JMU with similar student feedback. This can form the basis of a strong recommendation concerning a future trend for business postgraduate education supported by digital information technologies.

The development of quality resources is key to the future use of VLEs and Wise (2005, p. 113) outlines: "Academics are more likely to be recognized and rewarded for writing research articles and books than for creating imaginative e-learning materials. Many higher education institutions are, however, investing in authoring tools and so the university sector might be a net exporter of re-usable learning materials. There may be opportunities to change acquisition practices, and thus encourage more imaginative production of e-texts and other learning materials. This would also signal to university leaders that publishers are important partners in driving change and supporting the widening participation and other strategic agendas of importance to policy makers."

A proposed future look at VLE use was made by Totkov (2003, p.7) who outlined that: "The evolution in learning and training at distance can be characterised as a move from distance learning (d-learning) to e-learning to mobile learning (m-learning). These three stages correspond to the influence on society of the Industrial Revolution of the 18th to 19th centuries, the Electronics Revolution of the 1980s and the Wireless Revolution of the last years of the 20th century. The European project, from e-learning to m-learning, sets in place the first building block for the next generation of learning (the move from d-learning and e-learning to m-learning). The Leonardo da Vinci project sets out to design a Wireless VLE as harbinger of the future of learning."

This may be the immediate future direction for blend of e-learning to develop, however a more succinct future look may be found from the statement made by De Vries *et al* (2006, p.10) who say: "The involvement of regular teachers and professional instructional designers is needed to further educational innovation through the development and sharing of Learning Designs. Ultimately, individual teachers are the carriers of educational innovation in their institutes. Opportunities for this are created by instructional designers who in explorative projects guide new directions of educational innovation."

CONCLUSION

A comprehensive infrastructure, backed up by a robust Learning and Teaching Information strategy is essential for the support VLE mediated university courses. McDougall et al (2003) endorses this by outlining that as institutions throughout the world clamber to offer courses via the Internet, many are blissfully ignorant of the support infrastructure that is required to deliver a high quality service to their new market. Within a globally competitive environment, the University of Southern Queensland's (USQs) strategically planned, systematically integrated and institutionally comprehensive student support infrastructure provides a model for sustainable and quality distance education (pp. 37-38). This is also the case for Liverpool JMU, for distance as well as on campus courses.

Blackboard is now embedded in the Learning and Teaching process of LJMU. From the period 2003 onwards feedback from students concerning Blackboard has diversified and been streamlined to address:

- Contributions to each of the university modules, as part of the student module feedback process students are asked to rate their satisfaction on the degree to which Blackboard supports their learning.
- Particular learning research questions concerning student approaches to various learning approaches or blended learning

VLE resource supports. This has resulted in targeted research.

- The efficacy of communication or assessment tools supported by Blackboard.

In terms of the development of blended e-learning resources, costs of production, amongst others, have been a major barrier to resource developments in higher education. Generally the barriers fall into categories like: Costs; Project management (expertise); Author expertise amongst academics; Pedagogic issues related to the subject-matter; Learning and teaching strategy emphases on resource provision for different HEI's; and The offer of complete programmes with full web-based supports from publishers (but at a cost).

More recently, in the complementary area of electronic book developments, there have been three evaluations of electronic textbooks on the web through the Electronic Books ON-screen Interface (EBONI), which focused on assessing how appearance and design can affect users' sense of engagement and directness with the material (Wilson *et al.* 2003, p. 462) The EBONI Project's methodology for evaluating electronic textbooks is outlined and each experiment is described, together with an analysis of results. In recommending for future design, based on the main findings of the evaluations, users appear to want some features of paper books to be preserved in the electronic medium, while also preferring electronic text to be written in a scannable style.

(Falk, 2003, p. 258) has observed that university libraries are discovering that new digital resources are sometimes accompanied by new problems. For digital materials that originate on-campus, these libraries are able to retain primary responsibility, and to control content and access. But the bulk of electronic journals typically come to the libraries through licenses, and the ability to ensure long-term access to the journal files often remains in doubt. Observations have also been made that increased reliance on digital collections is leading to a decline in the importance of collections of printed materials (*ibid,* p. 261).

These observations are mirrored at Liverpool and the importance of the currency of the learning blend is paramount in the way students receive the VLE supports. There is an increased reliance on digital collections and linkages from VLEs are an essential component, as are the incorporation of e-books and structured, well-prepared e-learning resources.

To a large extent, on the VLE supported action learning programme at Liverpool JMU, the management of the learners and individuals was undertaken through adherence to the framework prescribed by funders, however the theory to overlay the concept of: action; review; planning; action was provided through comprehensive e-learning materials. It was not mandatory to follow these blended support materials, nor were they compulsory learning supports, students were studying three CPDs where assessment was optional.

It was proposed by the Liverpool action learning team that flexibility of delivery and assessment offered, was paramount in attracting busy SME manager/owners.

For this study it is also important that we should not lose sight of the single-gender nature of the cohort. This facilitated a whole range of benefits in terms of learning and discussions, not for reporting here. The programme team made strides towards a claim made by Anderson (2004) who stated: "Positive action training can help raise women's awareness and understanding of organizational attitudes but strongly implies that this initiative will have limited impact unless it is part of a wider portfolio of measures designed to induce change at organizational level".

The programme did not really suffer unmet expectations or needs from students. (Corley & Thorne, 2006, p. 43) have reported unmet needs with a postgraduate County Council development programme on management and change, where action learning is used. Their particular unmet needs centred on disillusionment with managers as a problem with implementing change. Students

on this pilot programme did not mirror that feedback, this was probably due to the students being predominantly owner/managers they were in fact the drivers of change in their own companies.

Feedback received for this pilot praised the e-learning supports approach, and many voices felt that "it provided an excellent resource for students." The supports existed outside of the sessions (hosted on a Blackboard web site) and provided for self-paced learning, guidance and theory. Cox (2003, p. 354) has stated: "E-Learning represents a process to align people, knowledge and strategy to build agile organizations that adapt to create value for internal and external stakeholders in a global industry." This may be viewed as a panacea as Graham (2004, p.314) argues: "Now what this suggests is that they (the students) do not simply require useful information, but a composite educational experience, and it may be that this is not something that digital technology can supply because it crucially involves learning with others."

Learning with others (group work) is critical to the action learning process, however the team and philosophy of the M.Ent. Programme offers the blended approach to learning whereby provision of e-learning supports does not exclude group work, rather, it complements the group work and because use of the supports is not compulsory it allows for the sets to be used according to Revan's Classical Principles of action learning.

Many of these observations have been mirrored in action learning studies supported by VLE's. Orsini-Jones (2004, p. 207) has reported that their action-research cycle was directly informed by students' feedback. It was refreshing to have the students' direct input into the shaping of a new module and the analysis of the research data relating to it. It was also possible to act on some of the student feedback during the time-span of the academic year. The thrust of developments at Liverpool JMU has been to include academic staff and students at the heart of all developments concerning the learning blend. In turn a committed group of academic staffs and Learning and Teaching development practitioners have developed the VLE support infrastructure and resources over a number of years, cognisant of the needs of students, their learning styles and needs, in order to maximise effective learning in the digital age.

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KEY TERMS AND DEFINITIONS

Action Learning is a process of disciplined small group discussion where each group member gets a period of strictly bounded time to discuss and present their company issues; the focus is on action and group members act as consultants. Action learning is learning from experience. The subject material is preferably always live and highly relevant to all concerned. A group agrees to meet over a period of time, they may come from the same type of organisation. The length of a session depends on the group size (the ideal size denoted by researchers is seven)

Blackboard is a virtual learning environment that you can access on and off a campus.

Blended Learning is a set of learning supports provided by academics and their universities that provide for a strategic mix tailored to the subject of study. This mix may include core learning materials; software; event-based activities; tailored learning approaches (problem-based, action learning, distance learning, activity-based learning), on-line conferencing; classroom teaching; workplace learning.

Commercial VLE is a commercially produced Virtual Learning Environment that is sold to universities or organisations under license, to

host web-based learning materials. Access to the VLE materials is usually via passwords held by university employees/students or organizational employees.

Hybrid Model of Resource Provision is one based on traditional web-based supports but where the core subject specific learning materials and blend is developed by a range of institutions, widely accepted (across institutions) and designed, written or reviewed with cross institutional peer reviewing.

In-House Model of Resource Provision is one based on traditional web-based supports where the core subject specific learning materials and blend is accepted (within institutions) and designed, written or reviewed with peers inside the same institution or possibly external reviewers.

Problem-based Learning is centred around a problem, a query or puzzle that the learner wishes to solve. The approach uses stimulus material to prompt student discussion and problem solving. That is usually reflective of professional practice. Critical thinking is encouraged by providing students only limited resources to help them develop resolutions to the problem in question, having students work cooperatively in small groups, in and out of class. The approach enables students to identify their learning needs and the appropriate set of solution resources. The approach also encourages students to self-evaluate and self-validate their learning processes by reapplying the new technical knowledge and problem solving approaches to other problems in the field.

Virtual Learning Environment is a system that supports a range of learning contexts, ranging from conventional, classroom implementation to off-line, distance learning and online learning.

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Chapter 20
Designing Contextualized Interaction for Learning

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ABSTRACT

In the following chapter, an overview is given over the experiences and design decisions made in the European project RAFT for enabling live distributed collaboration between learners in the field and in the classroom. Beside a context analysis for defining requirements for service needed as an underlying infrastructure user interface design decisions were essential in the project. As a flexible and powerful approach a widget based design for the user interface enable the project to build clients for a variety of hardware and devices in the learning environment ranging from mobile phones, PDAs, tablet PCs, desktop computers, to electronic whiteboard solutions. Enabling consistent and synchronized access to information streams in such a distributed learning environment can be seen one essential insight of the described research.

INTRODUCTION

In the last years the Web 2.0 developments also had an important impact on the e-learning 2.0 approaches and new forms of modular and personal learning environments. These personal learning environments integrate and make use of a variety of learning services and "mash up" those services in individual instantiations of learning environments. Additionally also the field of mobile and ubiquitous computing has established a variety of solutions and best practices bringing e-learning support to the nomadic user. The nomadic user has special requirements and as the user/learner

accesses learning support in a variety of context these requirements change. This basically holds both for single users accessing technology and information from different learning contexts as also for collaborative systems that enable distributed learning. As a classical setup for such distribute access to a learning environment we would like to highlight systems for supporting remote collaboration between mobile and classroom settings. The European project RAFT was a project exploring this field for about three years and a lot of lessons have been learned from this project as also empirical studies have demonstrated the effects of well-designed flexible environments supporting such distributed collaboration for learning.

On the one hand these developments describe a trend towards decomposition from highly complex and integrated monolithic learning management systems towards frameworks that enable the dynamic composition of personal learning environments out of a wide range of services and open source systems providing high level functional service interfaces for easy integration (Web-services, APIs). On the other hand the mobility trends and the usability requirements of mobile devices and mobile information access clearly highlight the split of complex e-learning environments into focused small applications of pieces of functionality designed for the context of use referred as widgets or appliances.

This chapter will describe and analyze developments coming from the e-learning 2.0 environments that are composed of Web-services and integrate those services based on flexible and customizable user interfaces that can consume and easily provide personal learning environments. Furthermore the next challenge ahead for making use of such environments is the distribution of such systems between different client systems that can be used mobile, on the desktop, electronic whiteboards, or in embedded displays and interaction devices.

First we will describe the contextual analysis for developing a service portfolio based on a functional specification and a clustering of such functions. The services where also further defined by a description of service orchestration and how the base services have to be combined for higher level use cases and instructional designs.

Second in a mapping between pedagogical roles, the underlying instructional designs, and a variety of mobile, desktop, and whiteboard clients, contextualized user interfaces consisting of widget combinations and customizations where developed based on the described service infrastructure in the European RAFT project.

We will describe developments and design approaches for mobile and contextualized learning support systems and how these systems support nomadic users and the access to functionality from a variety of user interfaces via flexible and dynamically configurable widget frameworks and the underlying service infrastructure.

BACKGROUND AND RELATED WORK

Situated learning as introduced by Lave and Wenger (Wenger & Lave, 1991) states the importance of knowledge acquisition in a cultural context and the integration in a community of practice. Learning in this sense must not only be planned structured by a curriculum but also by the tasks and learning situations and the interaction with the social environment of the learner. This is often contrasted with the classroom-based learning where most knowledge is out of context and presented de-contextualized. On the one hand the process of contextualization and de-contextualization might be important for abstraction and generalization of knowledge on the other hand in the sense of cognitive apprenticeship (Collins, Brown, & Newman, 1989) it is reasonable to guide the learner towards appropriate levels and context of knowledge coming from an authentic learning situation. Contextualized and mobile learning combine the latest developments in ubiquitous

and context aware computing with pedagogical approaches relevant to structure more situated and context aware learning support. Searching for different backgrounds of mobile and contextualized learning authors have identified the relations between existing educational paradigms and new classes of mobile applications for education (Naismith, Lonsdale, Vavoula, & Sharples, 2004). Furthermore best practices of mobile learning applications have been identified and discussed in focused workshops (Stone, Alsop, Briggs, & Tompsett, 2002; Tatar, Roschelle, Vahey, & Peunel, 2002). Especially in the area of educational field trips (Equator Project, 2003; RAFT, 2003) in the last years innovative approaches for intuitive usage of contextualized mobile interfaces have been developed.

Many of the field trip support systems have firstly developed new tools for information collection in the field nevertheless a real added value has been shown in connecting the field trip and the classroom via live conferencing and data transmission for shared task work and collaboration (Bergin, 2004). Mostly in newer approaches individual small snippets of functionality or focused applications are provided to individual users or small teams of users with mobile devices, which deliver a part of the complete learning experience and contribute to a bigger shared learning task. The measurements or data from these smaller components are often combined into data streams for allowing analysis, stimulating discussions on multiple perspectives, or reflective learning support. An example for how the functionality for such systems can be split up to support distributed collaborative learning with a variety of devices is described in detail in the next section.

Basically beside the analysis of all activities included in the instructional scenarios a definition of different roles and a split of functionality in the information architecture taking into account the problems of mobile interaction and constraints of mobile user interfaces is essential for the successful design of such contextualized learning support environments. Recent research in human computer interaction describes several trends in designing new interfaces for interacting with information systems. Benford et al. (Benford et al., 2005) describe four main trends which include growing interest and relevance of sensing technologies, growing diversity in physical interfaces, increasing mobility and physical engagement in HCI, and a shift in types of applications for which innovative interfaces are designed. These developments also have a major impact on the development of new learning solutions and interfaces for explorative and situated learning support.

As context is a broad term we consider different interpretations for contextualized learning here as relevant and also consider different research backgrounds. Nevertheless we understand all different forms of contextualization as an adaptation process to different parameters of a learning situation. The learning environment adapts different adaptation targets (functionality, content, tasks) to different parameters of context (learning task, user characteristics, physical environment). Following Leutner personalization and contextualization can be seen as specialized forms of adaptation. At the core of adaptive systems are adaptive methods, which take an adaptation mean as a certain user characteristic or a part of the current user context and adapt different adaptation targets to this adaptation mean (Leutner, 1992).

For building infrastructures and technical solutions for contextualization relevant work comes from research on context-aware systems (A. Zimmermann, Lorenz, & Specht, 2005) in this interpretation often low level environmental context parameters as location, noise, lighting, temperature, are taken as adaptation means for adapting the learning environment. Considering the adaptation mean Zimmermann et. al distinguish between definitions by synonym or definitions by example which mainly name and describe certain context parameters as location, identity, time, temperature, noise, as well as be-

liefs, desires, and commitments and intentions (Andreas Zimmermann, Lorenz, & Oppermann, 2007). Furthermore they introduce an operational definition of context describing following main categories of context information:

- Individuality Context, includes information about objects and users in the real world as well as information about groups and the attributes or properties the members have in common.
- Time Context, basically this dimension ranges from simple points in time to ranges, intervals and a complete history of entities.
- Locations Context, are divided into quantitative and qualitative location models, which allow to work with absolute and relative positions.
- Activity Context, reflects the entities goals, tasks, and actions.
- Relations Context, captures the relation an entity has established to other entities, and describes social, functional, and compositional relationships.

Another approach for using and modelling context information for knowledge worker and learning support is described in (Lokaiczyk et. Al. 2007). The process context allows to take into account the working steps and process progress modelled in working environments often by business process modelling languages. The authors differentiate event-based models and state-based models for process modelling which support different representation of process context information as also different adaptations. Furthermore they differentiate between semiautomatic identification of task context by analysing working documents of users and the user context which is quite similar to the attributes clustered in the individuality context mentioned by Zimmermann et. Al. (2007).

As a relevant approach from the field of instructional design and modelling of learning context recent approaches for supporting flexible IMS Learning Design deployment environments are important. Recent examples of delivering IMS-LD designs on mobile devices have for example been demonstrated in (Sampson, 2008). Furthermore current developments in authoring environments for instructional design integrate more and more also the integration of mobile learning activities and the delivery of those on different devices. With the splitting of functionality in underlying service frameworks and step from widget based desktop user interfaces towards widget based mobile user interfaces we expect new possibilities for collaborative distributed learning support. First experiences into this direction will be described in this chapter.

A DESIGN METHODOLOGY FOR CONTEXTUALIZED INTERACTION

In the context of the European funded project RAFT - Remotely Accessible Field Trips- the consortium created learning tools for remote field trip support in schools. The system should support a variety of learners with different tasks either in the classroom or in the field.

RAFT envisioned to facilitate field trips for schools and to enable international collaboration of schools. Instead of managing a trip for 30 students, small groups from the RAFT partner schools went out to the field, while the other students and classes from remote schools participate interactively from their classrooms via the Internet. The groups going to the field were equipped with data gathering devices (photographic, video, audio, measuring), wireless communication and a video conferencing system for direct interaction between the field and the classroom.

Field trips are an ideal example for an established pedagogical method that can be enhanced with computer-based tools for new ways of collaboration and individual active knowledge

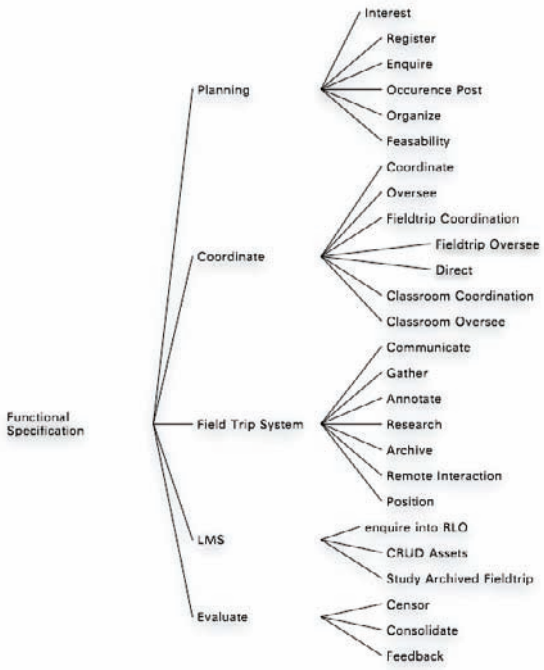
construction. The learners in the field can collect information and contextualize it with their own experiences and in the same time work on tasks with their peers and detect new perspectives and solutions to given problems. To foster the variety of perspectives and activities in the field trip process RAFT developed tools for the focused support of different activities in the field and in the classroom.

Basically from analysing the tasks and activities of users in non-technically supported field trips a role model was developed for roles specializing on different tasks in the field trip. Additionally in a first phase also the usage of out of the box technology (digital cameras, PDAs, GPS devices, Tablet PC) was tested and the usefulness and usability of end users was taken in formal evaluation studies and end user creativity workshops. In a second phase the functionality for technically supporting distributed field trips was specified in a functional description and clustering of the functionality in dedicated appliances. User interfaces for dedicated roles where then basically developed by analysing, which appliances or end user widgets are necessary for enabling full technical support of the different roles. In a last step the information architectures for different roles where defined and combinations of necessary hardware features and appliances where identified. The different steps are described in the following sections.

Functional Analysis and Service Design

Based on a conceptual model of a field trip different functional clusters where identified ranging from planning activities, coordination and management activities, and field activities as data gathering, tagging, annotation, and in-situ data analysis where identified. In the functional specification a list of activities for the different field trip phases

Figure 1. Field trip activity clusters from the functional analysis



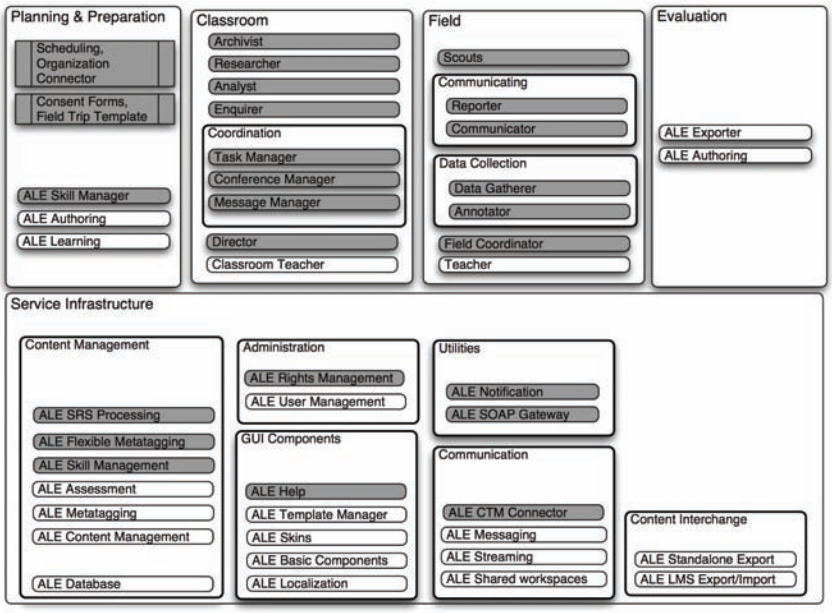
were identified based on scenarios from different subjects and instructional designs for field trips. A selection of the found functionality is shown in Figure 1.

To support a wide variety of different learning activities and the usage of interfaces on different devices the user interface of the RAFT system had to be built out of single blocks that support different client technologies and interaction styles. Therefore based on the functional specification coming out of the requirements analysis phase we clustered the functionality into components and recombined those components depending on the task and the interaction device that were foreseen for a certain user role. Additionally a Web service layer was build on the basis of the ALE LCMS (Kravcik & Specht, 2004) which allowed us to give access to a wide variety of interface technologies connecting and implementing the application logic for different activities. Figure 2 gives an overview of the different ALE service frameworks and applications needed for the different phases of the "Interactive Field Trip System" (IFTS) in RAFT. Beside the different tasks for preparation, evaluation and the field trip activity itself the ALE system provided a basic service infrastructure that needed to be extended with some new functionality for RAFT requirements.

The RAFT services in this sense all build on a common infrastructure with base services as content management, communications support and utilities for administrative support. Furthermore it became clear that a base library for certain interface components was necessary as field trip support applications in most cases had to be adapted to the specific field trip type. Basically the RAFT IFTS integrates all functionality and modules needed for the preparation, the evaluation and the actual field trip. Extending the existing frameworks and functionality with specific functionality and integrating it into a consistent IFTS application provided the basic functionality.

The existing ALE system that was used already provided basic functionality for content inter-

Figure 2 gives an overview of the core service frameworks and functional frameworks as also user applications in the different phases

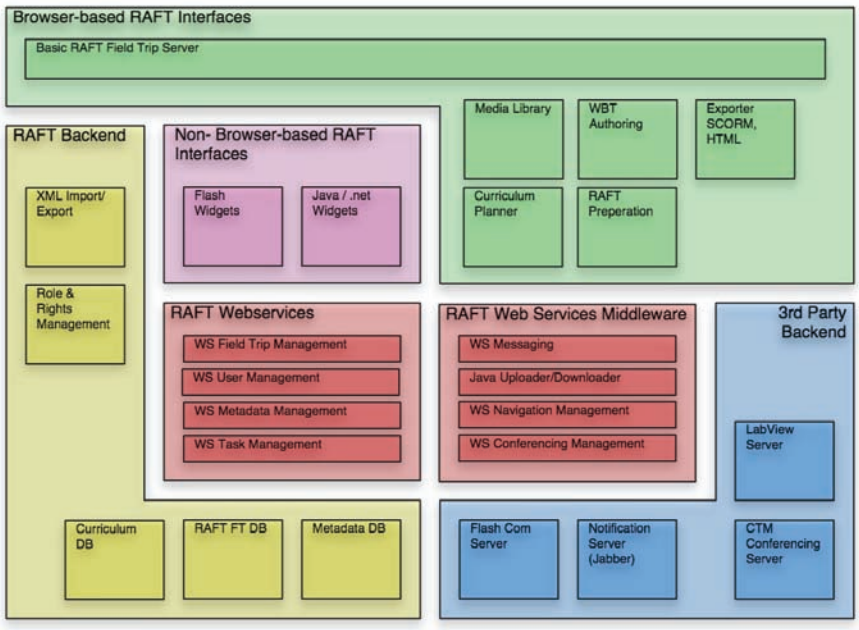


change, content management, communication and streaming, and basic interface components like described in the previous section. In the next section we will give a brief overview of selected RAFT service frameworks that where added.

- **ALE Flexible Metatagging:** Provided data model and functionality to define metadata schemas and to provide metadata sets based on these schemas. The schemas define sets, structures and properties of attributes, which should be entered by users providing metadata. The framework supports multiple and flexible schemas. The schemas are used for easy semi-automatic creation and standard- based support of metadata sets allowing reach flexibility and reuse of existing data. This framework had to be added as new forms of metadata as location data or environmental data had to be added to the content recorded and created live in the field. Furthermore the metadata sets could differ based on the subject and instructional design of the field trip.
- **ALE CTM Connector:** Provided the functionality to communicate with the video conferencing solution (Click To Meet) and create a new videoconference room, get its id and store it as part of a paragraph. This was realized via a Web service enabling the creation and recall of new videoconference rooms from different video conferencing clients. This was also relevant for setting up the field trip and enable flexible access to the video conference from different user interfaces and widgets.
- **ALE Notification:** Handled receiving and distributing notifications between all connected clients and supports the system's awareness functionalities. This was achieved by a central Instant Messaging Server based on the Jabber protocol (http://www.jabber.org, an OpenSource XML based real-time message interchange protocol) who distributes the notifications. Implemented with Jabber Server and Connection Libraries for Flash, Java, and CE.net. The requirement to synchronize clients components based on different technologies can be seen as an essential element of distributed live collaboration systems.
- **ALE Database / RAFT Database:** Managed all content synchronization and storage in the database. The ALE Database framework holds the basic data model for RLOs specifying the content structure of field trips, content, assessment and exercise elements provided by the ALE system. This framework allowed the usage of the RAFT LMS with different databases and a special RAFT data model that has been developed as extension of the basic content aggregation model.
- **ALE Course Content Management:** Provides logic for combining learning objects in hierarchical or non- hierarchical structures and defines the clusters of content that are defined as high level learning objects, i.e. Courses, Field Trips, Blended Courseware. The framework was extended to handle the new RAFT types like fieldtrip, task, etc.
- **ALE Content Block Management:** Provides all functionality for the management of content blocks, the lowest level of granularity in the ALE content model. A content block can contain canned content like images, text, references, video, animations but also reference to live streams embedded in a content page.
- **ALE User Management:** The user management will allow creation and editing of user accounts, importing user accounts from external data sources like text files or LDAP directories and assigning roles and user rights. It works closely together with the rights management. This framework has been extended to support the role of the user in the fieldtrips.

- **ALE Basic Components:** Basic interface components allow the user interface of ALE to have a consistent handling and user interaction. The framework can be used by applications like an interface widget library with a variety of components like navigations trees, tab components, listings and other. Basically this can be seen as an early version of current development for widget servers that enable to server a library of interface components and flexibly link them to data containers or in this case learning objects of different granularity.
- **ALE Exporter:** The basic exporter framework allowed exporting content into different content interchange formats (CIF). For RAFT mainly standalone formats for schools Web servers and SCORM compatible CIF for integration of RAFT content into standard LMS will be important. For RAFT exporters the following formats have been added: RAFT standalone (HTML, JavaScript) and RAFT SCORM, RAFT Mobile.
- **ALE Archivist:** The archiving framework provides functionality to store parts of a course, the whole course or several courses into an external format and to retrieve them later into the same or a different database. It will deal also with data integrity and key resolution, for example when primary/foreign keys already exist in the target database.
- **ALE Communication:** ALE contains basic communication functionality this can be used by any application integrating this framework. It can be used to have forums, chats and other synchronous and asynchronous communication tools. It is based on simple message metaphors that allow communicating via messages with attachments.
- **ALE Streaming:** The ALE streaming framework allows integrating streaming functionality into ALE applications by simply using a preconfigured streaming server. This allows user to integrate live streaming content in RLO pages.

Figure 3. The basic RAFT infrastructure



As shown in Figure 3 the different services described above used underlying existing services and tools as a Learning Management System (ALE) and Live Conferencing (Flash Communication Server, Click TO Meet Server, and LabView Server) for integration via the Web services in non-browser based and plain browser based user interfaces.

Towards Nomadic User Interfaces

To develop flexible user interfaces that are focused on specific roles and activities and also fit in the whole distribution of activities and tasks in a second step out of the scenarios in different teaching domains and the functional specification use cases and roles where developed. An example is given in Figure 4.

In parallel to this functional clustering also a role model for different pedagogically motivated roles was developed. An excerpt of those is given in Table 1.

The definition and fine-tuning of the roles enabled by the RAFT system was developed through an iterative approach, based on the observation and involvement of users in order to gain a detailed understanding of requirements. Field trips with school students were held in Scotland, Slovakia, Canada and Germany to identify different activities in the field and in the classroom and to draw first evaluations of critical factors. In line with a contextual inquiry approach (Beyer & Holtzblatt, 1998), our aim was to observe and analyze the users' environment for patterns of collaborative activity, and involve users in the evaluation of technologies.

To provide an example of how our contextual inquiry was conducted, we report our experience in a preliminary field trip trialled on the coast of Tentsmuir together with students from the Harris Academy of Dundee, Scotland. Our aim in this research was to initiate and implement the idea of roles, to gauge the ergonomics of using PDAs in the field, and to test the GPS, GPRS and mapping software during the course of a field trip. In the field, nine 14-years-old students would be using a variety of sampling and gathering techniques to study the development of the dunes that characterize the Tentsmuir Coast.

Figure 4. Clustered use cases based on roles and phases of activity. The diagram shows teacher field trip preparation use cases.

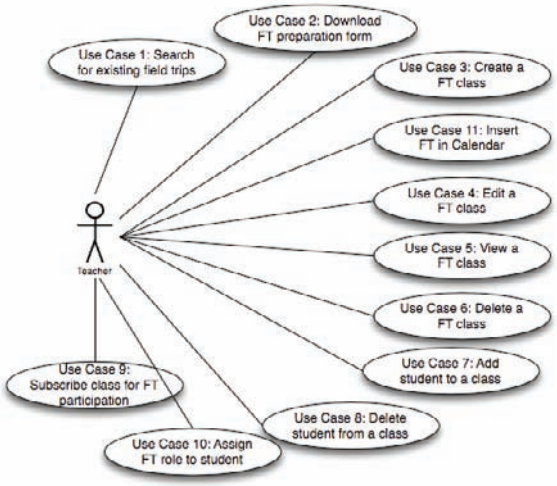


Table 1. Basic functional Roles and their function with examples

Role/Function Description	Functions	Example
Expert Interviews/ Reporter	Structure Interview, Moderate questions from the classroom	A field trip class wants to learn about a defined station in a complex production process
Datagatherer/Annotator: During the field trip the students gather data to support/disprove the proposed hypothesis and to find new interesting aspects. Means of data-gathering examples: video, camera, sensor data	Collect Data, Annotate content with metadata, collect sensor measures, verify concrete hypotheses	Students go to the different phases of the chocolate production process and document the stages with photos.
Analyse: Data gained from site is analysed and discussed in the field trip, in the classroom and post field trip event.	Research online, evaluate incoming data from the field	Students look at the images taken from a biology field trip and assess the quality and if hypotheses can be verified based on the acquired materials.

In a first step, we let the teacher fill the RAFT field trip template, so as to specify pedagogic and curricular goals and indicate tasks. The work involved different learning modules and the students were divided into four groups, engaged in different activities such as landform transect, vegetation survey, soil survey, stream flow measuring. Instructions for each activity were transferred onto PDAs. The roles involved in the RAFT approach were explained and the students were told that they would play Data Gatherers, Scouts and Annotators. This experience suggested that the analyst in the classroom, in charge to analyse and elaborate the raw data collected in the field, has an important function: he/she must check immediately that the data being received is complete and appropriate, so that the data can be recorded again if necessary, and the opportunity to obtain the necessary data from the field is not lost.

The role-specific information architecture has direct effects on the screen layout of the user interfaces. This suggested us to look for solutions that would adopt design principles such as

scalability, modularity and flexibility. Given the dynamic set of devices that characterizes the RAFT Field Trips, the challenge is to provide a single GUI that runs on all the devices and yet accommodates the input, output and processing capabilities of each device. Our approach in this matter proposes a widget-based scalable and modular interface, which adapts to the role and to the device. The widgets constitute building blocks, functional frames where different components can be placed and displayed, enabling different options. According to the functional components, we defined different widgets that need to adapt to the roles' needs and hardware features.

Based on the role model and the non-functional requirements from the prototyping experiences a basic mapping of functionality and roles was done. Basically by defining such a matrix the focus of the role for a certain task was set and also the cooperation context for different roles was defined.

On the one hand learning pairs could be defined by the roles like the Data Gatherer and Annotator pair, which have a clear split of responsibilities: while the navigator knows where to go on the map to collect certain data the annotator looks at the collected data and annotates it with the current context, both roles get their current context by agreeing on a common task. Another example is the Reporter and communicator pair, while the reporter concentrates on the verbal communication between classroom and expert and has a moderating role the communicator focuses on

Table 2. Mapping roles and functional widgets

Role	Task Widget	Navigation Widget	Messaging Widget	Conference Widget
Field Site				
Data Gatherer	+	+	+	-
Annotator	+	-	+	-
Reporter	+	+	+	-
Communicator	+	-	-	+
Classroom				
Task Manager	+	-	+	-
Director	+	+	+	+
Analyst	+	-	+	-

documenting and capturing the communication with the conferencing and recording facilities. On the other hand in the classroom site the director has a moderating role for the whole class and therefore needs all information available on the classroom big screen, while the task manager only concentrates on managing and structuring tasks for the field trip on the fly.

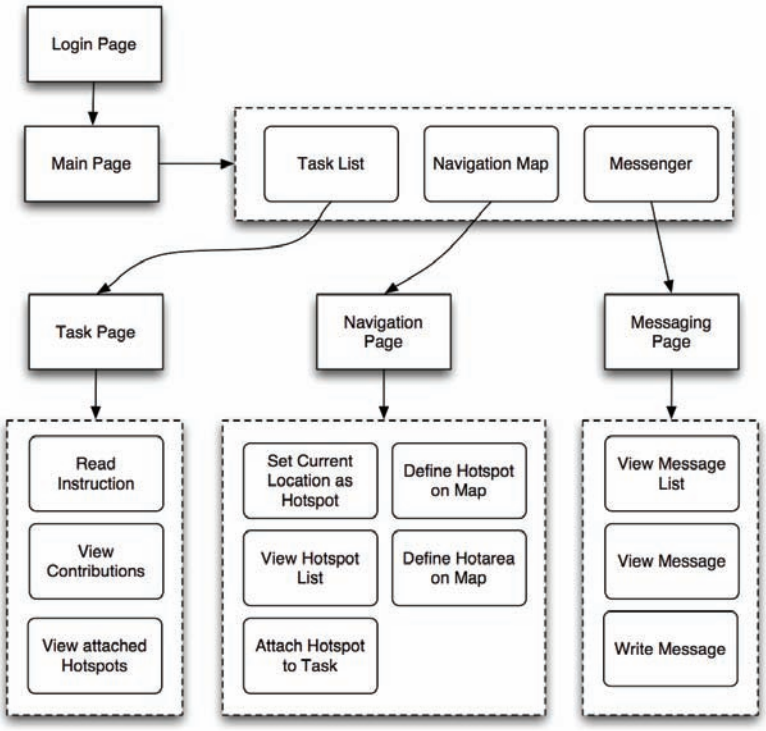
During the field trips in RAFT it became obvious that the roles do not always need to be split between persons but several roles can also be taken over by one person if complexity allows. Additionally it became obvious during ongoing usage studies with out of the box hardware that roles could also be split between different users if the hardware used could be split in a logical way between the task participants working on a certain role. For example the data gathering could be split between handling the GPS device for taking measures of the location and between the personal collecting the data, this was basically dependent on the complexity of collected data and metadata. Therefore in the design further requirements for dynamically configuring user interfaces by splitting up or combining functionality were identified.

For the different roles in the field trip the information architectures for the different appliances where inferred. One example shows the scouting application in Figure 5. According to the related use cases, the Scout searches for interesting points in the field and needs to be informed about tasks; to be able to send information about interesting locations (hotspots); to communicate with other users in the class and in the field. Therefore, the Scout's main interaction widgets are Task, Communication, and Navigation ones, enabling him/her to communicate the personal current position to the other team members and set hotspots for points of interest. A device suiting these requirements is a GPS, GPRS enabled handheld device, providing features of portability and trackability.

The Scout mainly cooperates with the Task Manager in the classroom and the Data Gathering teams in the field. Therefore, the entities a Scout manipulates go into a consistent field trip object repository and can be seen and manipulated by other team members in the field and in the classroom.

The Scout starts to search for points of interest and scans the environment; as soon as he/she founds something interesting, he/she locks the position and a notification with the Point Of Interest (POI) record is stored in the shared field trip repository. Awareness about changes in the state of tasks and data collections for tasks plays an important role for the collaborative work and

Figure 5. The information architecture of the scouting application



the design of the interface. The repository automatically sends a notification to the team members and also to the Task Manager. The Task Manager evaluates the data and the metadata of the Scout and decides if more scouting is needed or the data gathering and annotation can start.

Based on this infrastructure the RAFT partners developed a variety of interface components and widgets based on different technologies like Java, Microsoft .NET, Macromedia Flash and others. Those widgets could then be easily combined in different applications, which allowed a highly focused and contextualized cooperation between different field trip participants.

As an additional problem of designing communication and cooperation between mobile, desktop, and whiteboard clients the problem of multimodal interaction became important. An instantiation of a multimodal communication channel widget is the messaging widget as one component of the RAFT interface. Depending on the input and output characteristics of the device of a user the messaging can be used with classical keyboard input on a classroom role but the back-channel from a mobile user interface in the field has to be based on audio recording as typing not really while walking and collecting data in the field.

Another example is the communication between and archiver who is mainly working with a classical PC terminal and Web access and a data gatherer in the field: As output channel the archiver can use the PC screen and therefore mostly receives text output. On the other hand a scout in the field walking around with a mobile device cannot easily use a text input. Most virtual keyboard input possibilities were quite unusable in the field due to lighting conditions and difficult typing on a mobile device on the move. Therefore the mobile users mostly used scribbles on a notepad like widget and audio input when the environmental conditions allow for.

CONCLUSION AND FUTURE TRENDS

The RAFT project raised a lot of technical and interaction issues relevant for the field of designing learning experiences for mobile and pervasive learning. Beside the backend technology based on an LCMS and Web services that allowed for the combination of different client technologies from electronic whiteboards to mobile telephones the synchronization and notification of heterogeneous clients accessing a persistent and consistent learning object repository became very important.

As we found the field trip a very good example not only the synchronization between different user cooperating on a common task, but also the distribution over the different phases of the field trip (preperation, field trip activitiy, and evaluation) appeared to be an important aspect of nomadic activities for learning and exploration.

Furthermore from the prototyping and analysis of the fieldwork by end users we saw the following main activities for supporting distributed contextualized learning approaches:

Cooperative task work for synchronizing activities and raising interest: The distributed work on a task focuses the interaction and communication between the learners, technology get into the background when the curiosity about the given task and its exploration in physical and knowledge space become the main interest. The context in this sense is an enabling mean that allows the learners to immerse in the learning subject at hand.

Data Gathering for Active Construction of knowledge and learning materials: Users are much more motivated when "self made" learning material get integrated in the curriculum and they have the possibility to extend existing pre-given structures for learning.

Instant and multimodal messaging for a lively experience: The instant exchange of multimodal messages on different service levels was identified as a core requirement to make a live field trip experience happing between the field and the classroom.

Similar to the developments described in this chapter we see comparable trends in a variety of European projects for delivering flexible contextualized user interfaces based on widget approaches. Recently in the TenCompetence integrated project and the MACE project approaches for widget based interfaces and the integration of those widgets with an underlying instructional design engine based on IMS-LD have been developed. In the TENCompetence project a widget server has been developed which allows for the integration of widgets and a control of them based IMS Learning Design. The widget server mainly enables Learning Design authors who wish to use actual services within SleD/Coppercore environment and allows authors to leverage & create new external services and use them in their Learning Designs. The server is based on the draft W3C widget specification and it offers the possibility to add new widget services and make them available to the Learning Design runtime.

Furthermore more and more Web 2.0 services integrate the power of mobile information access and creation any space where learners have access to content and activities can become a learning space on an ad hoc basis. When designing such systems very little is known about how such collaborative learning systems can facilitate people's collaboration in the best way and not to distract and become a hurdle between accessing and experiencing the real world while having digital tool support. Examples that can be found in the literature describing and designing mobile social software as a learning aid have recently been analysed in (De Jong, Specht, & Koper, 2008)

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Chapter 21
Employing Innovative Learning Strategies Using an E-Learning Platform

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ABSTRACT

Web-based learning environments have become an integral part of learning. The way that they are employed in the learning process, or in other words the learning strategy followed in that respect, is an important issue that has to be carefully thought of, deciding upon topics such as suitable pedagogical approaches and appropriate assessment techniques for a given context. The chapter deals with this exact issue by visiting the relevant literature on the subject, describing selected learning strategies that have been employed in the use of an innovative eLearning platform in schools in Europe and finally outlining and comparing two real case studies from two European countries.

INTRODUCTION

Informal learning today becomes the dominant form of learning (Tuomi, 2007). Peer-to-peer and problem-based learning in real-world contexts as well as learning through games and entertainment is becoming more and more popular. At the same time, eLearning systems are still being frequently used for teaching (transmissive learning), but noticeably less for autonomous learning, reflection, social and communication skills development, problem solving capacities (expansive learning) and alike (Ulf, 2007). To overcome this, every attempt to design an eLearning experience should begin with the pedagogical strategies that drive it and continue with setting the learning goals and designing learning activities that require the appropriate eLearning content to meet those

learning goals, *cf.* (Kelly *et al.*, 2005). The selection of technologies has to be performed then within the context of these pedagogical choices so as to understand both the potential of learning and the development of successful eLearning resources.

Learning often seems to be a natural process; however, the many definitions of and theories on learning confirm that human learning is a complex activity. Literature concerning learning strategies explores different ways of learning. Learning strategies, as defined by Nisbet and Shucksmith (1986), are seen as the processes that underlie performance on thinking tasks, while Mayer (1988) defines learning strategies as behaviors, manners of a learner that are intended to influence a person's cognitive processes during learning. In line with the latter definition, an implementation of theoretical foundations in praxis is illustrated in the chapter. Concerns about the gap between theory and practice, about what instructional designers have learned and experienced in the workplace as well as the lack of a unifying perspective on human learning have raised the question – how an innovative learning strategy can be employed using a Web-based learning environment. Specifically, our objective is to indicate how taken "pedagogical decisions" implicate the selection of suitable pedagogical approaches and assessment techniques to be employed in an innovative eLearning platform.

This chapter first presents a literature review of the area of pedagogy in eLearning, focusing on learning theories and the concept of a learning scenario. It later summarizes the several issues/problems one encounters when it comes to employing an eLearning system and implementing a pedagogical framework for eLearning. A proposal solution for overcoming some of these obstacles is presented in detail, supporting it with the results of two real world case studies. Finally, conclusions are drawn and future research trends are identified.

PEDAGOGY IN eLEARNING

Learning Theories

Teaching and learning activities can be designed and implemented to take principles of learning into account, emphasizing on the fact that learning occurs within certain context and that is active, social as well as reflective (Driscoll, 2002). The spectrum of learning theories consists of a plethora of methodologies and approaches explaining how people learn, with behaviourism, cognitivism and constructivism being well-known categories of these. It is clear that the lack of a unifying theory on human learning gives rise to gaps between the theory and practice of instructional design. Nevertheless, ideas about learning in general fall under two headings – the generic heading of socio-cultural theory, including for example "communities of practice" (Wenger, 1998), and "activity theory" (Engestrom, 1987). Since, from this perspective, the basic unit of analysis is larger than the individual learner (e.g. the "activity system") these theories are able to account for learning in collaborative contexts. The idea of "distributed learning" is important here but it is a term that is not always used consistently. From a socio-cultural point of view learning takes place through the co-construction of meanings, specifically it is distributed across learners (agents/actors). This is a stronger claim than the simple proposition that learning can be distributed, say across a network, in the form of content or other resources. An emphasis on "practice" and "activity" is consistent with constructivist and socio-constructivist theories of learning which place the learner as agent at the heart of the learning process.

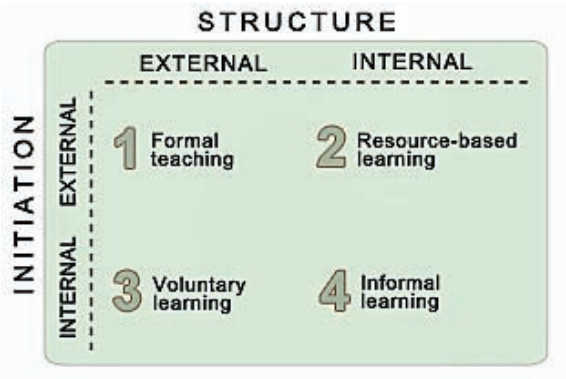
Another key idea is that of "situated learning". This is important because it draws attention not only to social context but also to material culture, including technology. A recent and significant development in cognitive science is the emergence of an "embodied-embedded approach", see for

example (Wheeler, 2005). Here cognition and, by implication learning, is "outsourced" to the non-neuronal body and the environment, including the social environment. This too is broadly consistent with a socio-cultural approach but, importantly, it also draws attention to the active learner in a material context, where things in the world (texts, artifacts, languages) are not simply tools for learning; they actually do a lot of cognitive work for the learner. Examples of how, hitherto difficult-to-access, concepts and processes are made available to learners through information and communications technology (ICT) are not difficult to find.

Theories about learning such as the ones mentioned above have helped broaden the focus of attention, defining learning in a broad sense as a process that continues from birth to death, in and out of formal environments such as schools. Livingstone (2004), cited in (Taylor and Evans, 2005), defines four categories of learning in terms of the extent to which it is internally or externally structured or initiated, resulting in the matrix depicted in Figure 1.

In resource-based learning learners are encouraged to access resources (including online resources) independently, managing their own learning but towards goals that are set by the curriculum. An example of the third category would be "voluntary learning" in a school setting

Figure 1. Livingstone's categories of learning



where students choose to follow certain courses or participate in extracurricular programs. With respect to the formal/informal learning range, examples of eLearning can be found where the roles of teacher and learner are fluid and therefore difficult to define.

Rather than providing an overview of mLearning technologies addressing the specific curriculum areas, Naismith *et al.* (2004) take up an activity-centered viewpoint, considering new practices against existing theories. More specifically, they identify six theory-based categories of learning activities and related examples of the use of mobile technology in each category. mLearning concepts and technology can be considered within the following learning theories:

a. *Behaviourist*: In the course of activities that endorse learning as a change in learners' behavior.
b. *Constructivist*: In the course of activities in which learners construct new ideas or concepts based on their previous and current knowledge.
c. *Situated*: In the course of activities where learning takes place within an authentic context and culture.
d. *Collaborative*: In the course of activities in which learners gain knowledge through social interaction.
e. *Informal and lifelong*: in the course of activities that promote learning outside a formal learning environment and curriculum.
f. *learning and teaching support*: in the course of activities that support the coordination of learners and resources.

The Learning Scenario Concept

Evans and Taylor (2005) define scenarios as "stories focused on a user or group of users, which would provide information on the nature of the users, the goals they want to achieve and the context in which the activities will take place.

They are written in ordinary language, and are therefore understandable to various stakeholders, including users. They may also contain different degrees of detail." As described in (UNITE Public Deliverable 1, 2006) a learning scenario should involve all the methods that need to be applied in planned activities within classrooms, the roles of the actors in the learning process (students, teachers, school headmasters and administrators) and the kind of cooperation among different groups (i.e. classroom as whole, small groups of students in the same classroom or in different classrooms). It should be flexible enough so as to be creatively reusable, to allow teacher's intervention and be adaptable to changes according to the number of students and classes to which is implemented. According to Erskine *et al.* (1997) in scenario-based design the first step is to write down the scenario in a detailed narrative form. Subsequently, claims about the usability and usefulness of particular artifacts envisioned in the scenario are made. These claims are also recorded in a manner that maintains their link to the scenarios they analyze. This process of scenario construction and claims analysis is conducted as an iterative cycle. In the end, the accumulated scenarios and claims constitute the design's description and rationale.

Scenarios support a mutually informing dialogue between technology experts, pedagogues and evaluators (Taylor and Evans, 2005). This is why scenarios call for continuous feedback among them with the view to constantly improving scenarios according to the settled pedagogical objectives, the technical requirements and evaluation offered by all involved agents. Carroll (1999), who also studied the concept of a learning scenario, described it as a sequence of *actions* and *events* that take place in a particular *setting* and are performed by *agents* or *actors* who try to meet certain *goals* or *objectives*.

IMPORTANT ISSUES

New skills – technical, intellectual and social – are becoming essential for living, working and participating actively in a knowledge society and while their scope extends well beyond "digital literacy", they are the basis on which the society depends on (European Commission, 2001). The ability to use ICT is essential in many sectors. A European Reference Framework (European Commission, 2005) sets out the eight key competences: Communication in the mother tongue; Communication in the foreign languages; Mathematical competence and basic competences in science and technology; Digital competence; Learning to learn; Interpersonal, intercultural and social competences and civic competence; Entrepreneurship; and Cultural expression. eLearning platforms can contribute to the development of these competences through specialized courses. Competences like "learning to learn" and "interpersonal, intercultural and social competences" can be developed using new approaches of learning and eLearning functionalities that promote collaboration, group work and communication.

Having outlined the importance of acquiring the key competences and the opportunity of using an eLearning system for that purpose, we will introduce several concerns related to employing innovative learning strategies within the context of using an innovative eLearning platform. eLearning requires certain digital literacy skills in order to offer a beneficial learning experience. The question that emerges is the following one: do we need eLearning systems to help to cope with competence challenges or competencies are needed to cope with eLearning systems? Therefore, the tools for eLearning should not necessarily require a high level of digital literacy before a learner can engage in an eLearning activity (Selinger, 2005).

In order to support the improvement of the learners' subject matter knowledge and the implementation of a learning strategy, eLearn-

ing environments should be designed to address learners' diversity in terms of learning styles, prior knowledge, culture and self-regulation skills (Vovides, 2007). Individualized learning and reflective learning are two important ingredients that can enhance an eLearning system that supports learning and instruction offering the necessary scaffolds for the development of meta-cognitive and self-regulatory skills. In essence, the scaffolds within an eLearning system need to be adaptive in order to foster student self-regulation in open-ended learning environments, *cf.* (Azevedo, 2005). The roots of the theory behind software scaffolding lie in Vygotsky's (1978) work on the Zone of Proximal Development (ZPD). In this respect, the software would play the role of the knowledgeable peer who provides the learner with adequately challenging activities and offers the appropriate assistance both in quantity and in quality. As the learner learns that assistance would be gradually withdrawn (Luckin *et al*., 2003).

Another issue is that of compatibility of cognitive styles and technology which directly impact perceptions of learning effectiveness, motivation and performance. When cognitive styles and technology are compatible, individuals are better equipped to pay attention to and understand relevant information, which are important to learning and learning outcomes (Workman, 2004).

Issues related to the design and implementation of a "pedagogical framework" comprise also learners' diversity in terms of meta-cognitive skills, learning styles, prior knowledge and cultures in addition to the role of the instructor in an eLearning platform. One of the effective ways of understanding, describing and evaluating the aspects of the design and implementation of an eLearning system that directly affect learning is Reeves' (1994) scale consisting of the fourteen pedagogical dimensions. The pedagogical dimensions refer to the capabilities of an eLearning system to initiate powerful instructional interactions, monitor learner progress, empower effective teachers, accommodate individual differences or promote cooperative learning. As such, dimensions have the potential to provide improved criteria for understanding and comparing eLearning systems. Reeves' methodology will also be used in the chapter to present the findings and to compare the two case studies described.

Among several other problems that inhibit the implementation of innovation strategies in European learning, Dondi (2006) explains the lack of the culture for support in European education and training systems since innovation plans are implemented at a very slow pace and sometimes even abandoned before their final implementation. Another problem he points out is that of low level of effectiveness and efficiency of the accumulation and utilization of available knowledge in the education field (in comparison to health or transport sector for example). Balacheff (2006) states that the academic research community has the responsibility to develop a research domain that is both scientifically robust and productive. He fears the possibility of "reinventing the wheel and developing technologies that are forgotten soon after their development". Also, he is afraid that research needs are not expressed in the same way by all the European nations (since the needs are not the same either). As we firsthand observed while conducting a "national specifics" survey in 14 European countries (Ćukušić *et al.*, 2007), it is difficult to express these "needs" since the educational systems and context in general vary widely between countries. Therefore a common framework could be developed but some issues surely arise in real-life settings upon implementation.

A different issue is that of a competent eLearning team. The team that produces quality eLearning material in a large, complex eLearning project according to Horton (2001) should consist of about sixteen people: one person should manage the whole project, three people should design the course (lead designer, module designers and subject matter experts), six people should build the content (course integrator, writers, graphics

specialists, multimedia developers, html/xml coders and programmers), three members should provide the technical infrastructure (network administrators, server/database programmers and technical support specialists) and three members should conduct eLearning (curriculum administrator, course facilitator and online instructor). Downsizing to fit the needs of simpler projects is possible and of course necessary. The actual makeup of the team depends on size and the scope of the project, amount of work outsourced, specific media and technologies required and a like (*ibid*.). Besides, it is possible that the same required skills can be provided by different combinations of team members. The sustainability of an eLearning platform depends on whether there are more than few people involved in the maintenance of the system after its implementation: which structures are in place to support students in their eLearning and which structures are in place to support staff in their implementation of eLearning (support to the pedagogical framework).

Varis (2005) poses other important questions that challenge the implementation of learning in virtual environments: approaches to learning, ways to combine traditional and new ways of learning and the like. How do self-directed, facilitated web-based learning, virtual classrooms and discussion formats perform in practice? What is the present stage of development of experiential and interactive learning models? Are teachers and supporting staff equipped with the right knowledge to apply these approaches? Vuorikari (2004) reflects on use of ICT in learning. According to her study's conclusions, ICT is used but teaching is still "traditional". She offers two possible reasons: teachers are just starting to learn how to use ICT in a more constructive way and eLearning systems hardly support the desired change in the learning and teaching paradigm in school. Tools for new ways of collaborative exercises that support learner-centered pedagogy do not exist; therefore it is easier for a teacher to practice "traditional" teaching. In situation changes special focus is put on pedagogical approaches and ways they could be supported by ICT. To introduce an eLearning system in daily practice, teachers' training in the application of pedagogical models using the system should give them a solid starting point. An ongoing pedagogical support could and should be provided to help teachers with the new practice. The foreknowledge of teachers is not equal and many of them have problems getting enough time to apply the techniques within the school curriculum. Personal motivation is of great importance for those teachers.

This section attempted to pinpoint different eLearning realities affecting pedagogy directly or indirectly. Issues that potentially hinder the successful employment of innovative eLearning platforms, as well as the implementation of a pedagogical framework in that context, were described. For achieving effective and efficient eLearning, that offers learners an optimal learning experience, the issues raised above should be dealt with.

SOLUTIONS AND RECOMMENDATIONS

Designing and Using an Innovative eLearning Platform

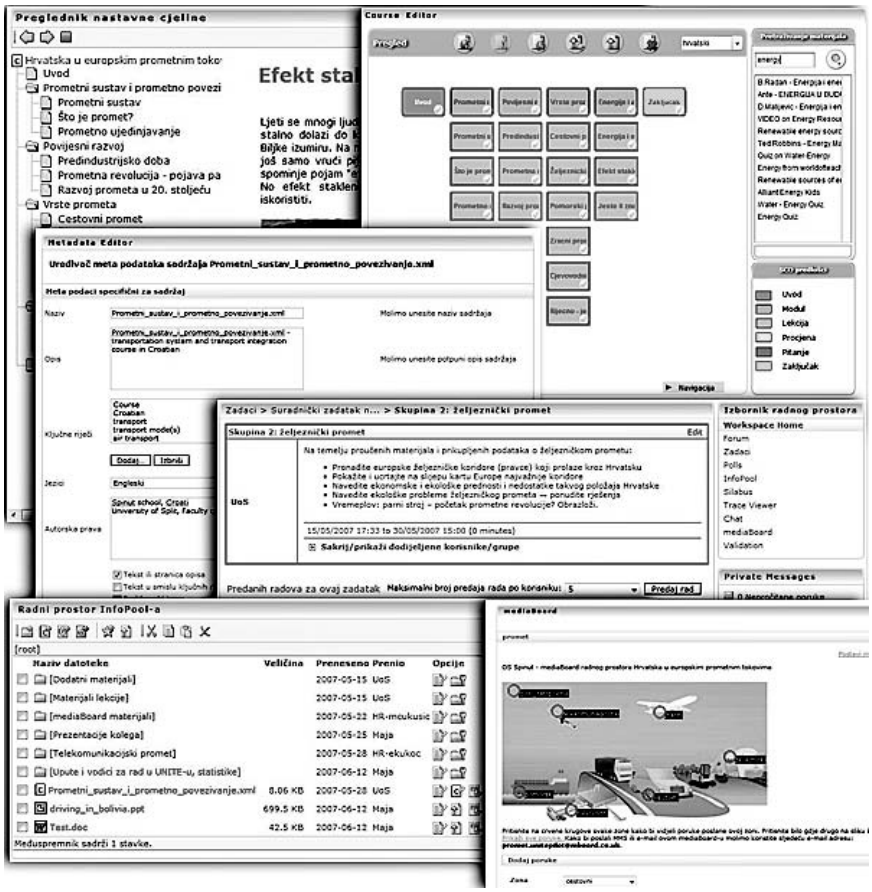
Solutions and recommendations to some of the issues presented hereinafter will be based on our firsthand experience from the UNITE (Unified eLearning environment for the school) project. UNITE (2006) is a thirty-month long European research project (February 2006 – July 2008) aiming to provide novel services in education for young Europeans by combining different state-of-the-art (SOTA) technologies in e/mLearning, also taking into consideration innovation in technology and pedagogy. Deployment of UNITE's principles and methods is accomplished through incremental introduction coupled with continuous evaluation. The design and the implementation phase com-

prised joint work of project partners and partner schools (network of 14 European schools) related to setting up the infrastructure, planning, creation and delivery of new and/or customized learning scenarios as well as validation of performed activities (Ćukušić *et al.*, 2008a).

The UNITE platform is considered an "add-on" to currently used forms of interaction and contributes to developments of interactive learning in the European-wide network of schools (as an illustration see the platform's user interface in Figure 2). It is important to point out that in some participating schools whole-class teaching prevailed before an employment of the new e/mLearning system. Teaching and learning with the UNITE platform implies the use of curriculum material delivered, not only in English, but also in the partners' mother tongue: *eLearning scenario template* along with more than 40 different scenario examples (UNITE Public Deliverable 5.3, 2008), *Content development handbook* (Tzanavari, 2007) and *Teachers' handbook* conveying the pedagogical principles (Ćukušić *et al.*, 2007).

While designing the pedagogical framework of the UNITE e/mLearning system, three main aspects were taken into account. First, the existing state-of-the-art models of exploitation of the potential of new technologies in pedagogy along with the list of user requirements related to the pedagogical framework were thoroughly analyzed. Both SOTA models in pedagogy and user requirements are available in (UNITE Public Deliverable 1, 2006). Second, in order to acknowledge local context of the network of

Figure 2. Screenshots of the UNITE platform's user interface



schools, national and school specifics regarding educational characteristics and existing pedagogical practices were collected and formulated. Finally, the pedagogical experts analyzed a wider context in order to find out which components should assemble a "best-practice" pedagogical framework (see Figure 3).

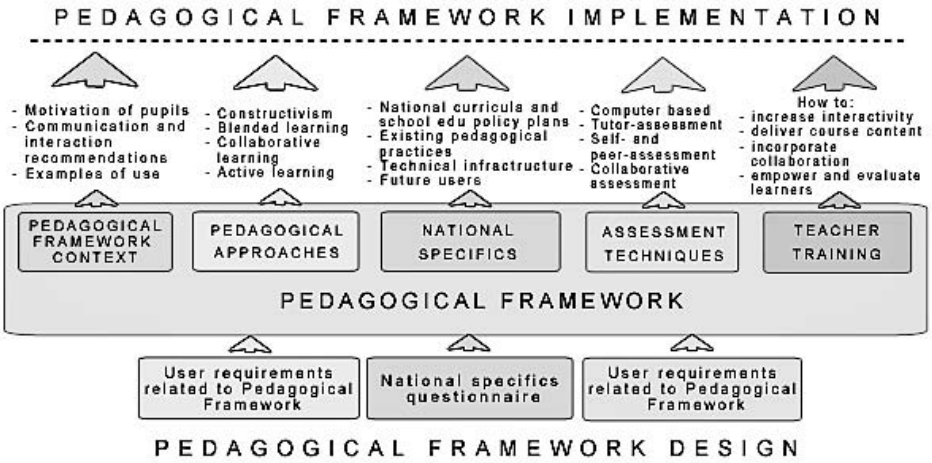
Consequently, the following five-component *pedagogical framework* with suitable and beneficial theories and practices was developed (Granić & Ćukušić, 2007):

a. *Pedagogical framework context:* Defines areas that influence the framework itself and forms the basis for further development of UNITE's theories.
b. *Pedagogical approaches/strategies:* Promotes principles of constructivist theory, along with blended, collaborative and active learning in particular.
c. *Knowledge evaluation techniques/strategies:* Defines and supports diverse types of assessments.
d. *Teacher training:* Enables successful online teaching and thus is introduced as an important part of the pedagogical framework.
e. *Current pedagogical practices and national specifics:* Implementation of pedagogical changes in the schools already has and will have impact on pedagogical process, assessments and pedagogical assumptions in general.

Because the pedagogical and assessment strategies directly influence and inform the learning and teaching process, they are the fundamental part of any pedagogical framework. Namely, pedagogical innovation, if any, should be made clear in pedagogy or assessment applied in or out of everyday teaching classroom environment. Selected key pedagogical strategies along with employed assessment strategies are briefly described in subsections which follow the subsequent one related to eLearning scenario templates.

As previously mentioned, the list of user requirements related to the pedagogical framework formed the main point of reference for the first learning strategy design phase. Requirements were classified and categorized using a simple matrix (see Figure 4), as one of many possible ways of categorization. On the one hand, matrix rows are associated with autonomous/directed learning and active/passive learning, while on the other hand its columns are related to individualized/collaborative learning.

Figure 3. UNITE pedagogical framework (Granić & Ćukušić, 2007)



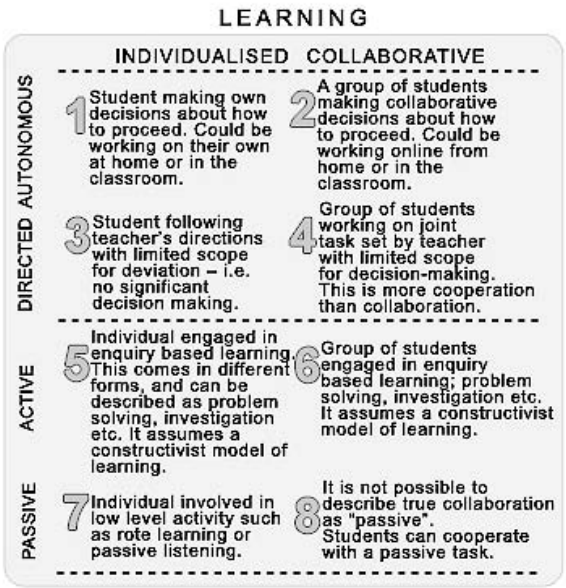
Learning scenarios are crucial mechanisms for eLearning, holding together pedagogy and technical development through a focus on concrete experience. That is why scenario planning, in which pedagogic and assessment strategies are clearly articulated through detailed descriptions of learning contexts, is very important.

UNITE eLearning Scenario Template

The development process of an eLearning scenario is fundamental because it refers to the codification of the scenario itself, after which it can be implemented in the school environment and potentially or perhaps ideally be reused by others. The quality of this codification, i.e. how well the scenario is described and documented, is directly related to how successful the scenario will be with respect to its reuse by others, its flexibility in implementation and a like (Zoakou *et al*., 2007).

Within the framework of the UNITE project, an appropriate solution for capturing scenarios was carefully selected based on the state-of-the-art analysis performed. In fact two solutions were identified that qualified as good candidates but would however have to be adapted to the project's particular needs. These were the Kynigos template (Kynigos, 1995) and the JISC template (JISC Template, 2004). The first one follows a narrative format and thus is easier for someone to create, whereas the second is in a structured tabular form with fields to fill-in and so more detailed but also time-consuming. The two of them were studied in relation to UNITE, leading to the creation of a hybrid solution, the *UNITE eLearning scenario template*, which is described in Table 1.

Figure 4. Categorization of user requirements for the pedagogical framework



The scenario template was polished and revised, primarily based on the UNITE pedagogical framework, before its final version was developed. The template aims to help teachers organize their eLearning lesson in the most efficient way and have an overall view of the steps they are going to follow. Consequently, it consists of two parts. The first one is related to the curriculum area (see section 1 in Table 1) and the second one is related to the pedagogical activities planned to take place during the scenario implementation (see section 2 in Table 1); each pedagogical activity is matched with a learning objective, the tools/resources the teacher plans to use, how he/she is going to evaluate each learning activity and how long it is going to last.

Pedagogical Strategies

The principles and praxis integrated into eLearning scenarios through the pedagogical framework were addressed in the *Teachers' Handbook* (Ćukušić *et al.*, 2007) and are presented below:

1. **Constructivism:** Constructivism (Alessi & Trollip, 2001) conveys the concept of student as the creator of knowledge and meaning through their interaction with one another, their environment and with teachers. Teachers can be thought of as being coaches, facilitators or even partners with

Table 1. UNITE elearning scenario template, adapted from (Zoakou et al, 2006)

1. Curriculum area
1.1 Subject/discipline area
1.2 Context/level of study
1.3 Topic/domain
1.4 Pre-requisite skills/ knowledge
1.5 Pedagogical Approach Brief description of the general pedagogical approach that will inform practice in the scenario outline in section 2. It refers to the theoretical underpinning channeling the modes of delivery and the learning activities that will follow e.g. Constructivist approach with particular focus on problem- based learning or experiential learning, etc.
2. Pedagogic Activities
2.1 Learning Activities The learning scenario should be outlined as a sequence of activities (i.e. a narrative) including information about what different actors (e.g. students, teachers) are doing at each stage. The way in which activities address learning objectives i.e. the modes of delivery should be clear, and this should be consistent with the overall approach specified in section 1.
2.2 Learning objectives/ outcome(s) These should be stated in terms of one of the four categories: knowledge (facts), understanding (concepts), skills and attitudes/values. They can be taken directly from prescribed schemes of work where appropriate.
2.3 Tools/ Resources Any physical/virtual tool (hardware, software) or resource (e.g. textbook) can be specified here. E-/M-learning resources in particular should be described in some detail
2.4 Assessment Strategy (Feedback and/or Evidence) With an emphasis on formative assessment key activities should be selected. Assessment strategies might include peer-commentary, the use of e-portfolios, self generated success criteria, photographic records
2.5 Time allocated

learners in the learning process. Formalization of the theory of constructivism is commonly credited to Piaget who suggested that through processes of accommodation and assimilation, individuals construct new knowledge from their experiences (for more details see Piaget, 1953). The cognitive or radical constructivism is believed to arise largely from Piaget's work while the social or realist constructivist practice is often held to draw from the work of Vygotsky (Hua Liu & Matthews, 2005). The constructivist approach to teaching and learning forms the theoretical basis upon which the pedagogical model presented here is designed. It was/ will be implemented in various educational contexts in diverse ways (hands-on learning, reflection, interaction, investigation and analysis, *cf.* e.g. (Gray, 2001; Ullrich, 2005)) requiring from teachers to design instruction correspondingly. This emphasizes the fact that in constructivist classroom teacher and student share responsibility and decision making as well as demonstrate mutual respect.

2. **Blended learning:** Teachers used and will use eLearning systems as a technological enhancement to their everyday teaching process. They use the best of both traditional, specifically face-to-face, and online communication according to the principles of blended (hybrid) learning. It has been argued that up to 80% of verbal exchange in the classroom is attributed to the teacher

(Grogan, 2006). Conversely, in eLearning courses teachers do not "speak" more than their students (Marcelo, 2006) suggesting that learners, who are too shy to contribute in the classroom, feel more empowered to do so online (Jonassen, 1996). Therefore, blended learning seems as an ideal teaching concept for the future and its employment in UNITE affects and empowers students to considerably contribute online as well.

3. **Collaborative learning:** Collaborative learning (Prince, 2004) is a term used for a variety of educational approaches involving joint intellectual effort by students or students and teachers together. It covers a number of approaches with variability in the amount of in-class or out-of-class time built around groups of students working and mutually searching for understanding, solutions and/or meanings. Some forms of collaborative problem solving include: (i) guided design as a very structured approach to group problem solving where students, working in small groups, practice decision-making in sequenced tasks, with detailed feedback at every step, (ii) cases, stories or real life situations setting up a problem for students to analyze and resolve in class or in study group session and (iii) peer writing involving students working in small groups at every stage of the writing process, formulating ideas, clarifying their positions, testing an argument or focusing a thesis statement (*ibid*.). One of the key notions in Vygotsky's approach to cognitive development is the Zone of Proximal Development (ZPD), which has significant implications for peer collaboration. Vygotsky (1978, p. 86) defines the ZPD as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers". In other words, learners who lack certain skills may learn more effectively in the social context provided by someone with the necessary knowledge (Eysenck & Flanagan, 2001).
4. **Active learning:** Active learning is defined as "any instructional method that engages students in the learning process" (Prince, 2004). It requires from students to think about what they are doing as opposed to passively receiving information from the teacher in traditional teaching methods. There is evidence of importance and effects of active learning to the quality of learning, innovations in education and alike. Some studies find higher class scores and less variably on items presented via active learning (Yoder & Hochevar, 2005) while others as benefits of active learning stress valuable contribution to the development of independent learning skills and ability to apply knowledge, preparing students for future careers (Sivan *et al.*, 2000).

UNITE scenarios engage individuals and/or groups in various forms of active learning like problem solving, case studying and enquiry-based learning, which contributes to the development of qualities like critical thinking and problem solving. Through these activities students are able to discover new information and become self-managed learners. Starting from the late 1980s both cognitive scientists and technologists have suggested that learners might understand the phenomena from the science and technology area better if they could build and manipulate the models of these phenomena (Bransford *et al*., 2000). This assumption is tested frequently in the classrooms with technology-based modeling tools. Of course, electronic devices and systems can enhance learners' performance but only in the case where they are used as a part of a consistent teaching and learning process consisting of suitable pedagogical and assessment approaches.

Assessment Strategies

Apart from introducing pedagogical principles and approaches, the pedagogical framework also reinforces the use of summative and particularly formative assessments in teaching and learning. Summative assessment is still the predominant way of evaluation of students' achievements. It is usually used at the end of a teaching unit to determine what has been learned by the student. On the other hand, problem solving, stimulations and project work with formative or on-going evaluation, present a step forward in order to acknowledge that assessment is actually part of the learning process. Formative assessment presents "all the activities undertaken by teachers and/or by their students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged" (Mödritscher *et al.*, 2006).

How and what is to be assessed depends on the goals and purpose of learning and the types of learning involved. Assessment needs to be embedded in the course design (Laurillard, 2002) to reflect and support the learning processes involved. The assessment of collaborative work is managed whereby individual contributions are recognized on the basis of individual work, with another value to reflect the group effort (Weller, 2002). On the other hand, self-assessment is experienced as promoting autonomy in that the students make their rules and negotiate them with their teachers. Learners are actively involved in decisions about their own criteria for assessment and the process of judging their own and others' work (McConnell, 2000).

There are a number of online assessment techniques (sometimes referred to as "alternative assessments") serving as a tool to support either formative or summative assessment. Tittelboom (2003) introduces Statements of Relevance, Interactive exercises and Peer-assessment of forum activities that support both formative and summative assessment:

- **Formative:** Pupils are presented with a number of questions which they can ask themselves and prepare Statements of Relevance as an exercise in introspection. These statements are not marked but are read and commented by the tutor. Interactive exercises range from reading reference materials and doing multiple choices, matching, gap-filling etc. and receiving programmed feedback messages after each answer (immediate feedback) or at the end of the exercise (delayed feedback). The students assess themselves (based of the feedback and the score indications they receive). They can also be asked to assess and give constructive comments on the contributions made by their group members using forums.
- **Summative:** At the end of the course, students have to submit a final Statement of Relevance summarizing the reflections they have recorded throughout the course (assessed by the tutor). The scores earned by the students in interactive exercises are not tracked or retained. The quality of the comments in forums is not directly marked but tutor assessment of the students' activities is incorporated in their final score for the course.

Assessment techniques of the pedagogical framework promoted in UNITE learning scenarios are introduced in the following:

1. **Computer-based assessment:** Quizzes are one of computer-based assessment techniques that were introduced in UNITE. Those multiple-choice type tests or quiz type questions were assigned: (i) at the beginning of a course for diagnostic purposes to indicate any areas where prerequisite knowledge may be inadequate, (ii) during a course in order to measure progress in understanding and/or (iii) at the end of a course to assist in revision. Several other assessment tech-

niques mentioned above were employed based on the intended learning objectives, kind of competencies to be mediated to students, extent to which the competencies should be mastered by students, reliability in grading, prevention of cheating, exam construction and a like, *cf.* (Mödritscher, 2006).

2. **Tutor-assessment:** eLearning systems offer students exceptional opportunities for individual communication with their teachers/tutors. Using the platform functionalities and e-mail, teachers were contacted throughout the day and as a result students actually always had a personal tutor available. Since the assessment and the grading were not realized only by computer-based tests, teachers used open-ended questions as well (e.g. writing essays or submitting some project work). In such a case the evaluation process is extremely time-consuming and self-/peer-assessment could ease the teacher's assessment overload.
3. **Self-assessment:** Student involvement in their own assessment is an important part of their preparation for life and future work. Through self-assessment, which is quite opposite to traditional assessment where written tests and oral exams still prevail, students track their personal development and deepen the learning experience. They take more responsibility for their own learning and also become more aware of their own knowledge gaps (if any), since they assess themselves in relation to the course objectives. Using an eLearning platform students accomplish exercises at their own pace and receive private feedback messages. Moreover, they are actively involved in taking decisions about their own assessment criteria as well as in judging their own and others' work, *cf.* (McConnell, 2006).
4. **Peer-assessment:** In peer-assessment students are engaged in helping each other to develop, review and assess other's course work. The UNITE system is well suited for peer-assessment because in forums students can easily share and comment on other students work and contributions. Forum discussions are more "relaxed" and can be used for low-stakes testing only. Exchange of ideas, evaluation and comments on the work of their peers makes peer-assessment part of learning process and valuable resource for mutual learning. In order to overcome and avoid comments like "I don't like his/her work", explicit instructions on what and how to assess, what aspects of the work should be taken into account and similar were provided.

CASE STUDIES

The eLearning Scenarios

UNITE has followed a certain procedure in order to implement its theories and practices in schools. UNITE's implementation process advances through four major phases including (i) scenario planning, (ii) scenario implementation, (iii) validation and (iv) platform and process improvement respectively (Ćukušić *et al.,* 2008a).

The Croatia Case

In the Elementary school Spinut (2008), a state school based in Split, a team of five people was formed, consisting of the school's headmaster, the pedagogue and three subject teachers. Support in terms of organizational and technical assistance was provided by the University of Split (UNITE project partner). After implementing two scenarios with older students (13 and 14 year-old), the third scenario approaches younger students also (from 11 to 15 years) and intends to stimulate their interest in science and technology (S&T). Current trends in the EU are showing that innova-

tive experiments on science teaching are proving benefits for education (Buysse, 2007). An elective course entitled *Wonderful World of Inventions* for talented students was therefore developed in order to encourage students' desire to learn and to give a playful dimension to the knowledge acquisition through the new learning scenario. Within its framework and parallel to the activities performed within the school environment, the activities taking place in more informal contexts like field trips, museums, institute laboratories and a like were undertaken.

According to the diverse areas/stages of the course, different pedagogical approaches are implemented. For example there was project work where students were encouraged to take a more active role, that of researchers, and to come up with their own sketches and designs (of a parachute, a plane or similar). Subsequently, students tried-out their designs in practice and actually learned-by-doing. There were elements of exploratory learning, with cooperative learning in groups, along with some couple-work. Students were also taught how to work/learn alone as individuals. The teacher acted mostly as students' mentor and not as a "typical" teacher. Field work, numerous visits and workshops were a great value-add to this scenario and an opportunity for students to learn astrology, robotics and science in general in a real-life environment(s). These new methods make science teaching more exciting.

UNITE is used as a repository of the learning material and problem-based tasks (either provided by the mentor or collected by students as a part of their research assignment) as well as an irreplaceable communication platform. Both synchronous and asynchronous communication and collaboration functionalities of UNITE are important for this scenario since the course is attended by a heterogeneous group of students. They attend their regular courses in different times of day; they go to different classes and the like. Furthermore, mobile learning capabilities, notes, journals and similar functionalities of the UNITE system were of great importance since students were able to track their progress, update their portfolio, reflect, explore and discuss. In this way, every student was provided with the opportunity to express her/himself, to experiment and to learn.

The Cyprus Case

In the English School (2008), a prestigious private secondary school based in the capital Nicosia, the team involved in eLearning scenario design, development and implementation consisted of the Head Teacher, a senior teacher of English, a senior teacher of Environmental Studies and a researcher from the University of Cyprus (UNITE project partner). The scenario topics were chosen by the teachers themselves, taking into account what the platform had to offer. One of the eLearning scenarios developed within the Environmental Studies subject was entitled *Traffic Survey* and originated from the real problem that students, teachers and parents faced everyday – traffic around and on campus. The students involved in this project were 16-17 years old.

Students were expected to a have good understanding of how modern cities are increasingly dependant on cars leading to all the associated problems. A group of Environmental Studies students carried out a stratified survey of the entire school student population with a 10 to 15% sample. The survey aimed at finding out how students come to school, how long it takes them, how they view the traffic problem on school grounds. The scenario involved activities that took place in the classroom, outdoors (for data collection), in the Geography computer lab and possibly at home.

The students followed an enquiry based approach whereby they set up a hypothesis and tested it. This involved a stage where a clear aim was set, stating what the objective was, designing methods of collecting data, organizing the logistics and the timing of the data collection. What fol-

lowed was the collaboration of putting together the data collected, analyzing it, presenting it in a visually effective manner and finally assessing the successes and validity of the results.

Both UNITE's learning resource repository and its communication facilities were used as well as its mLearning component, for visualization and classification of images even while the field work is under way.

Comparison of the Pedagogical Dimensions of the Two Scenarios

Reeves' (1994) methodology was considered suitable and thus was applied in order to explain how UNITE "enhances the learning experience". Pedagogical dimensions, as aspects of the design and implementation of the system that directly affect learning (see Table 2), have the potential to provide criteria for understanding and comparing scenarios/learning programmes. Consequently, the pedagogical dimensions of the scenarios *Wonderful World of Inventions* and *Traffic Survey* (among others) were qualitatively and graphically compared.

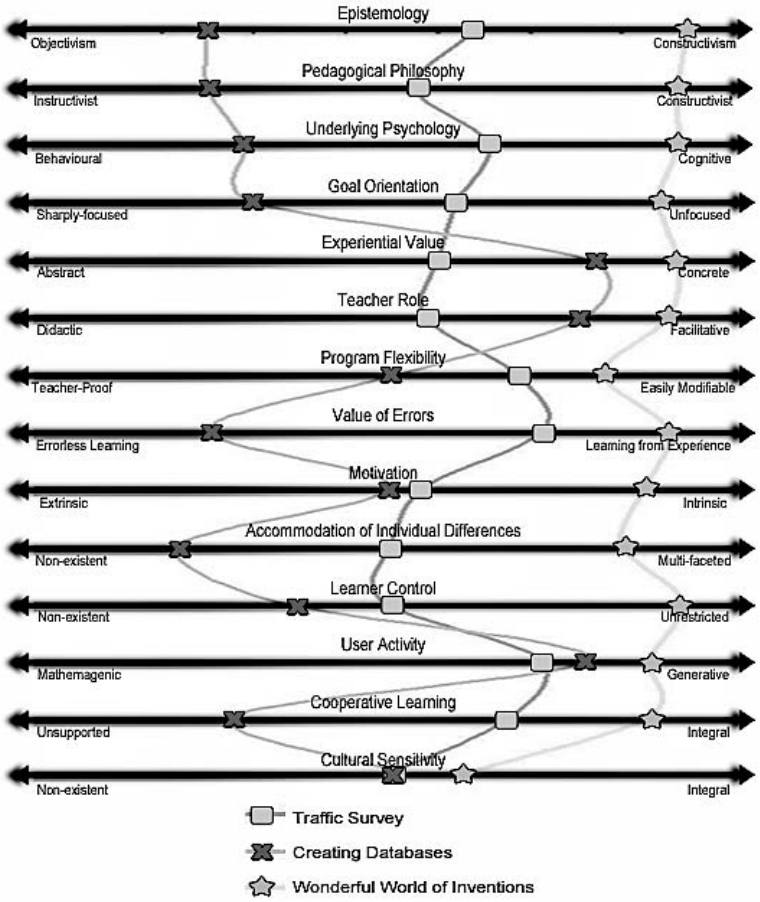
In February 2008, the project partners with the pedagogical background referred back to the fourteen scenarios and rated their pedagogical dimensions (Ćukušić *et al.*, 2008b). The purpose of the exercise was to provide a qualitative and graphical comparison of the scenarios and to create a "profile" of the particular scenario. Figure 5 illustrates how the scenarios *Wonderful World of Inventions* and *Traffic Survey* performed on Reeves' scale. In order to have an insight and be able to compare the profiles of selected scenarios, the third one is presented as well. The *Creating Databases* scenario was developed and implemented in the Riga Secondary school No 3, Latvia, within the information and technical science discipline area. A group of pupils of an 11th grade (17 year-olds) developed a school database that could be used in the school library. They learned how to create, plan and modify databases, communicate to each other and work in groups.

Table 2. Pedagogical dimensions of computer based education (Reeves, 1994)

Pedagogical dimensions of Computer Based Education			
1. Epistemology	*Objectivism*	⟷	*Constructivism*
2. Pedagogical philosophy	*Instructivist*	⟷	*Constructivist*
3. Underlying psychology	*Behavioural*	⟷	*Cognitive*
4. Goal orientation	*Sharply-focused*	⟷	*Unfocused*
5. Experiential value	*Abstract*	⟷	*Concrete*
6. Teacher role	*Didactic*	⟷	*Facilitative*
7. Program flexibility	*Teacher-Proof*	⟷	*Easily Modifiable*
8. Value of errors	*Errorless Learning*	⟷	*Learning from Experience*
9. Motivation	*Extrinsic*	⟷	*Intrinsic*
10. Accommodation of individual differences	*Non-existent*	⟷	*Multi-faceted*
11. Learner control	*Non-existent*	⟷	*Unrestricted*
12. User activity	*Mathemagenic*	⟷	*Generative*
13. Cooperative learning	*Unsupported*	⟷	*Integral*
14. Cultural sensitivity	*Non-existent*	⟷	*Integral*

Concrete experiences for students, collaborative learning, intrinsic motivation and a generative learning environment are features of all three scenarios. The role of teachers in the scenarios is that of integral facilitators who seeks to meet local and individual needs in the context of a loosely structured programme (*ibid.*). An evaluation of the UNITE scenarios based on Reeves' (1994) pedagogical dimensions revealed that UNITE is based on constructivist and cognitive foundations. The pedagogical dimensions of UNITE are best represented by the Social Sciences and Student Research Project scenarios (two of which are *Traffic Survey* and *Wonderful World of Inventions*) and are least represented by the ICT scenarios (e.g. *Creating Databases*). Understandably, student research projects like the two presented above, promote learning theories which are more inline with UNITE concepts (presented in the Solutions and Recommendations section). The plotted trendline shows that the *Traffic Survey* and *Wonderful World of Inventions* scenarios go more towards the right side, more towards the constructivist and cognitive foundations, whereas the *Creating Databases* scenario is very concrete and objective. The majority of the activities were based upon predefined content and scenario workflow whereas the majority of the learning objectives were focused on very specific results. Students could choose among two or three alternatives with respect to learning paths.

Figure 5. Pedagogical dimensions of the Traffic Survey and Wonderful World of Inventions scenarios compared to the Creating Databases scenario



FUTURE TRENDS

In the latest biennial joint report of the European Council and Commission (Joint progress report, 2008), education and training are identified as crucial to economic and social change. At the same time lifelong learning is considered highly important since it supports creativity and innovation, enabling full economic and social participation. Early school leavers, upper secondary attainment and key competences are reported as major problem areas where there has not been enough progress since 2000 to reach the EU benchmarks by 2010 (in some countries performance has even worsened between 2000 and 2006). Many young people leave education without the skills necessary for participation in the knowledge society and employment. According to the same report, at the moment 15,3 % people aged 18 to 24 in EU-27 leave school with no more than lower secondary education (*ibid.*). Save for the risk of social exclusion, these people are shut out of lifelong learning early in their lives.

Having outlined the importance of institutional and funded support and the necessity of developments in the EU education area, we will present some more favorable facts and trends in the eLearning field. The Education and Training 2010 work programme (European Commision, 2007) does provide practical support for education and training reforms and significant progress has been achieved since the programme was launched in 2002. Technological innovation is expanding the range of possible solutions that can support teaching and learning processes. The technology that is used for eLearning is as ordinary as a telephone and easy to use, in most cases. The technological challenges of the eLearning process (e.g. providing a usable, stable, universally available technological platform) have essentially been met (Rosenberg, 2001). We have presented UNITE, one of many available eLearning platforms which offers a wide range of capabilities, in both technical and methodological sense.

Challenges for the eLearning area are of the non-technological nature. As we move into the future it is important that we continue to identify successful models, learning strategies for eLearning at the institutional, program, course and activity levels that can be adapted to various contexts (Bonk & Graham, 2006). Only then we will understand and get the most out of the technology. Future research efforts within the eLearning domain will therefore be directed towards building adequate learning and assessment strategies that meet the challenges addressed at the beginning of this chapter. The eLearning environments should be designed to focus on learners' diversity in terms of learning styles, prior knowledge, culture and self-regulation skills (Vovides, 2007). Another important research direction is that of adaptation and self-regulation in the intelligent tutoring systems.

Additionally, the compatibility of cognitive styles and technology which directly impact perceptions of learning effectiveness, motivation and performance is important. In this case, learners are better equipped to pay attention to and understand relevant learning material and achieve learning outcomes (Workman, 2004). Bonk, Kim and Zeng (2006) summarize future trends in the eLearning area focusing on the most usual use of the eLearning systems – the blended learning (see Table 3).

As one may notice, there is only one trend from the Table 3 related to the technological side of the learning – the usage of mobile devices for teaching and learning. The use of mobile and handheld devices can and indeed has created rich and exciting learning opportunities. To a greater extent students bring their computing/mobile devices (e.g. pocket PCs, Smart Phones, notebooks, tablet PCs, graphical calculators, electronic dictionaries and a like) into the classrooms. These devices enable students to access the eLearning content everywhere and anytime, in a variety of situations in and out of school settings. This movement can be referred to as *ubiquitous learning* or *uLearning* (Milrad,

2007). Consequently, in order to identify the driving forces behind innovative learning practices, special focus should be placed on three different learning domains: (i) enhancing teaching practice with ubiquitous technologies in teacher education, (ii) collaborative mobile learning games in corporate settings and (iii) people on the move in a disturbed environment (Sharples, 2007). We find that these domains outstandingly underline three very important spheres of future research efforts of the technology-enhanced learning area. For successful "evolution" from eLearning to mLearning models, it is not enough just to take up mobile devices. Implementations of mLearning should primarily take into consideration several "eLearned" lessons (Wagner, 2005). Wagner also points out the necessity of a rich presentation layer that runs efficiently on a variety of platforms and a variety of form factors (*ibid*, p. 52). The major difference between eLearning and mLearning material is the advancement from more text- and graphics-based lessons to more voice-, graphics- and animation-based ones (Cobcroft, 2006).

Besides the trends caused by rapid development of mobile learning devices, eLearning environments also develop fast. They are becoming individualized; foster greater student responsibility and autonomy, furthermore focusing on real world experiences (using scenarios, simulations, role-play, problem-based learning concepts and a like). The role of an instructor also changes to one of a mentor, coach and counselor. In the years to come, there will no longer be a need to use the prefix "e" in eLearning or "m" in mLearning. The convenience and availability of the learning platforms will be as attractive as they are today and the technology will only be one more resource in the teaching and learning process.

CONCLUSION

This chapter, after visiting the relevant literature on the subject of learning strategies, provided evidence showing the importance of acquiring key competences today and raised some concerns with respect to using eLearning systems for that purpose, which mainly had to do with the appropriate learning and assessment strategies that need to be employed for an optimal learning experience.

Within the framework of a relevant European research project, whose main objective was to provide novel services in education for young Europeans by combining different state-of-the-art technologies in e/mLearning, also taking

Table 3. Trends and predictions related to blended learning (Bonk, Kim & Zeng, 2006)

Trends and predictions related to blended learning linked to the expansion of the online environments usage
Mobile Blended Learning
Greater Visualization, Individualization, and Hands-on Learning
Self-Determined Blended Learning
Increased Connectedness, Community, and Collaboration
Increased Authenticity and On-Demand Learning
Linking Work and Learning
Changed Calendaring
Blended Learning Course Designations
Changed Instructor Roles
The Emergence of Blended Learning Specialists

into consideration innovation in technology and pedagogy, the issue of employment of learning strategies was investigated. An innovative eLearning platform with a great range of functionalities was developed within the course of the project to support these objectives.

Subsequent to carrying out a state-of-the-art analysis, forming a user requirements list and researching into the various parameters that might affect pedagogical decisions, a pedagogical framework consisting of particular learning and assessment strategies was designed and tested in real settings. The chapter described these strategies in detail presenting their background, benefits and implementation possibilities.

The particular strategies were successfully employed in all learning environments involved in the aforementioned research project. Products resulting from this employment included the design and implementation of forty eLearning scenarios. Two of these scenarios, designed by teachers from two European countries, were presented and compared.

It is important that we continue to identify successful models and learning strategies for eLearning at different levels that can be adapted to various contexts. Addressing learners' diversity in terms of learning styles, prior knowledge, culture, self-regulation, cognitive styles, access to technology and other relevant issues will be the focus of future eLearning research efforts in a world that advances towards mobile learning, visualization, individualization, hands-on learning and similar.

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Loong Wong has worked in e-commerce and the education area and currently teaches in the Faculty of Business and Government at the University of Canberra, Australia. He has taught at various universities in Australia and overseas and has held senior industry positions. Loong has researched and published widely in diverse socio-economic and political issues and some of his publications can be found in *Prometheus, Asian Business and Management, Critical Sociology, International Financial Review, Social Responsibility Journal* amongst others. he has a continuing interest in democratising education and has been actively involved in the web for the last fifteen years.

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