INTERNATIONAL JOURNAL OF INSTRUCTIONAL TECHNOLOGY AND DISTANCE LEARNING

November 2006
Volume 3 Number 11

ISSN 1550-6908

PUBLISHER'S DECLARATION

Research and innovation in teaching and learning are prime topics for the *Journal of Instructional Technology and Distance Learning* (ISSN 1550-6908). The Journal was initiated in January 2004 to facilitate communication and collaboration among researchers, innovators, practitioners, and administrators of education and training involving innovative technologies and/or distance learning.

The Journal is monthly, refereed, and global. Intellectual property rights are retained by the author(s) and a Creative Commons Copyright permits replication of articles and eBooks for education related purposes. Publication is managed by DonEl Learning Inc. supported by a host of volunteer editors, referees and production staff that cross national boundaries.

IJITDL is committed to publish significant writings of high academic stature for worldwide distribution to stakeholders in distance learning and technology.

In 2 ½ years the Journal has over one million page views and 250,000 downloads of eBooks and monthly journals.

International Journal of
Instructional Technology & Distance Learning

Vol. 3. No. 11.

ISSN 1550-6908

Table of Contents – November 2006

Editorial

It's a Numbers Game

Donald G. Perrin

Modern communications is making increasing use of numbers to support its messages, whether it be a sports game, economic news, health services, or politics. We are surrounded by numbers – phone, cell, social security, bank accounts, mortgages, insurances, year-month-day-hour-second, age, birthdates, and calendars. The information highway adds IP addresses and turns text, pictures, videos, and interactive communications into digital formats of ones and zeros.

Hiccup!!! Even music and classical art work has been digitized. Analog has become digital.

Of course there are advantages. Rare and expensive technologies are now commonplace. The computer can emulate or simulate almost any machine. We can be our own print shop, publisher, video editor, flight trainer, or travel service. We can access great libraries, visit distant lands, and attend closed meetings or public performances without leaving our arm chair. The virtual world is becoming seamlessly attached to our real world and in some instances replacing it.

Google searches are even more popular than Starbuck's coffee. We have instant communications to everywhere about everything. The World-Wide-Web is complemented by email, instant messaging, blogs, chat rooms, internet phones, video-conferencing, net meeting, and many other systems. Access to information is easy and it is instant. And there is increasing use of expert systems and artificial intelligence to simply the user interface and reduce redundancy.

The disadvantages are also real. Couch potatoes get heart attacks. Internet crime hurts real people by stealing money, destroying data, and vandalizing computers and networks. Spammers litter and jam the channels of communication. It costs billions of dollars each year to protect against intrusion and repair damage caused by unknown assailants (Internet version of Terrorists).

Education and training is part of the equation because it is everywhere and ubiquitous. Internet learning is scalable to meet changing needs. It has taken its place side by side with conventional methods of instruction and made education accessible anywhere, anytime, to anyone.

Electronic communication is instant communication. As the car replaced the horse-and-buggy, snail-mail is replaced by email and instant messaging. Communication is more mobile, and smart cell phones are adding email, internet, music, videos, and global positioning systems. It is predicted that in a few years there will be more internet searches from cell phones than from PCs!

Interactive has become the criteria for all communications. And control has moved from the sender to the receiver. We determine when and where we want to watch a movie, attend a class or have a conversation. We use the resources of the internet to check the diagnosis of our doctor and the price of goods and services. We can go shopping on the Internet. Some people live, seek their mate, and even get married on the Internet.

I have to end here to attend a meeting (on the Internet). Later I will visit the Smithsonian (on the Internet), then blog some current issues with friends around the globe (on the Internet).

But first I must pick up the #2 off the carpet and take the puppy for a walk.

Editor's Note: This carefully researched study compares weblogs to other discussion tools. It provides insights and alternative points of view to support the academic value of blogging tools for discourse and opportunities these tools offer beyond current learning management systems and threaded discussions.

Comparing Weblogs to Threaded Discussion Tools in Online Educational Contexts

Donna Cameron, Terry Anderson

Canada

Abstract

Weblogs or blogs are being heralded as the "next big thing" in education. In this article we examine the advantages and disadvantages of this form of Internet-based interaction using the *Community of Inquiry* model with its focus on social, cognitive and teaching presences. We conclude that blogging has distinct advantages over more common threaded discussion in its support of style, ownership and identity, and its public nature may enhance resolution phases of cognitive presence. However, its lack of safety and the current inefficiencies of linking and threading messages present greater challenges than the more familiar threaded discussion or email list. Perhaps the blog's greatest relative advantage is for non formal and open education that takes learning beyond the traditional course.

Keywords: Weblogs, blogs, educational blogging, computer conferencing, threaded discussion, online education, distance education, education, Community of Inquiry Model, cognitive presence, social presence, teaching presence, ICT's, Information and Communication Technologies, Web 2.0, E-learning 2.0, RSS

Introduction

The latest buzz emanating from the Information and Communication Technologies world relates to the emergence of Web 2.0 defined by O'Reilly as "the network as platform, spanning all connected devices …creating network effects through an "architecture of participation"(O'Reilly, 2005) or more recently by Jones (2006) as "all the Web sites that get their value from the actions of users."

The notion of a next generation, more intelligent and semantically linked network has inspired educators to begin talking about a corresponding E-learning 2.0 (Downes, 2005). Of key interest to educators is the learning and teaching capability of network tools that move online learning and other forms of distance education from predominantly read-only text based systems to dynamic read-write and multimedia environments. Currently, the most popular tool for creating or writing to the Web is the Weblog or blog and its multimedia companions the pod and videocast – a set of applications that allow personalized publishing, archiving and retrieval of content created by anyone.

However, educators have, for at least 20 years, had access to write capacity through email, discussion lists, Usenet groups and, most commonly, through threaded discussions as supported by learning management systems such as Blackboard and Moodle. In this paper, we overview the pedagogical capacity of blogs in comparison to earlier forms of Internet-based educational tools, attempt to winnow the value from the hype and thereby assist educators in choosing between and effectively using blogs and other forms of Web 2.0 communications.

Educational Blogging

Blogs have captured the imagination of many networked educators and the Internet is full of exuberant claims as to their capacity to not only improve but in some instances revolutionize all levels of formal education. James Farmer, professional blog consultant, and founder of edublogs.org, claims that "through the use of blogs, … teachers and learners are becoming empowered, motivated, reflective and connected practitioners in new knowledge environments." (Farmer & Bartlett-Bragg, 2005) There is no doubt that blogging is very popular with current estimates of over 200 million active blogs[1]. What is less clear are the learning value and potential of blogs and especially that subset of learning that is orchestrated (and credentialed) by formal learning organizations.

Definitions of blogs abound, but instead of listing them here the best approach for those unfamiliar with educational blogs may be to provide a snapshot of one. Educator Will Richardson maintains an educational blog called *weblogg-ed* at http://www.weblogg-ed.com. This blog opens with the usual reverse chronologically ordered commentaries, authored by Richardson on a diverse set of topics, most of which focus on the application of the 'read-write web' to education. It is a personal publishing system in which Richardson shares his insights, comments, and recommendations with everyone, but the focus of this blog is an educational audience. Richardson also provides organized links to his personal recommendations of favourite blogs, resources, events – in sum creating a personal portal of all things education and blog related. One can think of a blog as a Web based, multi-media publishing system, that is very low cost (often free), very easy to use, customizable in terms of look and feel, content, target audience and hyperlinked to other content spread across the Internet.

Beyond the creation of content, is the means of distribution. Blogs are syndicated using a variety of XML based standards (RSS, ATOM etc). Readers interested in the blog content can subscribe and be alerted to new content or discussions that have been added to the blog using these syndicated protocols and compatible readers known as RSS aggregators. Much more detailed (and often heavily hyped) descriptions of blogs and syndication and their application in education are available online[2] and in print format[3].

Community of Inquiry Model

In this paper we build on our earlier work and discuss the use of blogs as tools to create and sustain a community of inquiry (Garrison, Anderson & Archer, 2000). The *Community of Inquiry* model (Figure 1) was developed to guide analysis of formal learning and inform teaching in online environments. The original work entailed developing indicators by which three critical components of an educational experience - teaching, social, and cognitive presence - could be defined, identified and measured. The original work was done through content analysis of computer conferencing transcripts but it has been enlarged and validated through survey and other qualitative investigation[4]. Farmer (2004) first applied the model to a blogging context and our work expands his initial analysis and focuses specifically on comparing blog affordances with those of computer conferencing within which the COI model was developed. It is hoped that this analysis will aide educators and instructional designers to determine how best to use blogs to enhance teaching and learning.

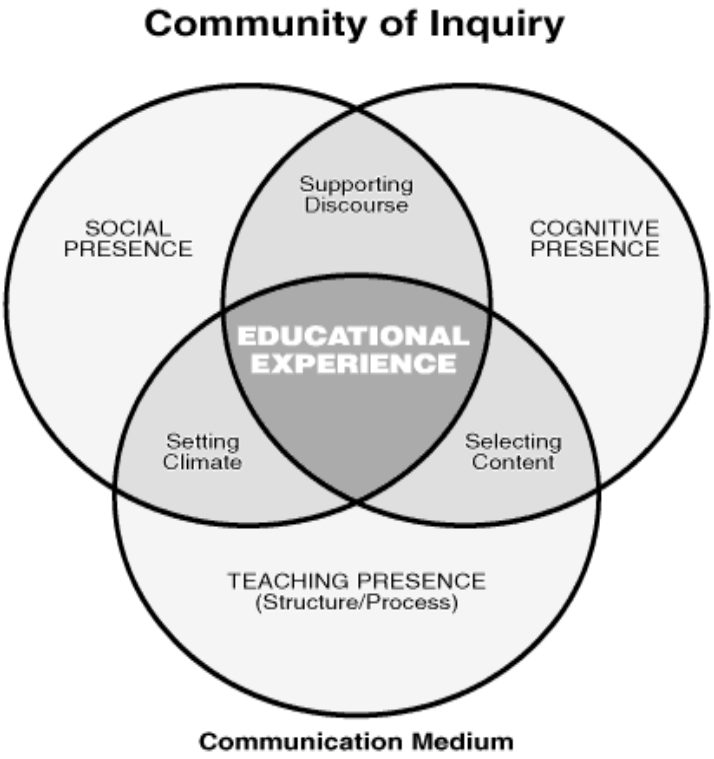


Figure 1. Community of Inquiry Model from Garrison & Anderson (2003)

Figure 1 illustrates the three 'presences' and the overlapping educational activities that define the Community of Inquiry model. We discuss the capacities of blogs and discussion boards in the support and development of each of these presences in turn.

Social Presence

We defined social presence quite simply as "the ability of participants in a community of inquiry to project themselves socially and emotionally as 'real' people" (Garrison & Anderson, 2003, p. 94). Given the "lean" communication context of text based interaction, we felt that establishment of social presence in the absence of body language, voice intimation and graphic aides would be challenging. We developed a series of indicators (affective, open communication and cohesive markers) and proceeded to analyze the text of educational transcripts. We found that social presence was present in quality courses and were able to triangulate the perception of this presence with survey and interview results (Rourke & Anderson, 2002). Although social presence can be established in conferencing environments, we also noted that it is not easily done and many are challenged to express themselves as 'real persons' within this text based and usually institutionally dominated environment.

In comparing social presence within discussion board and blog environments we find five areas of distinct difference – focus, identity, safety, style and ownership.

Focus

In order to project oneself as a real person, one's focus must be directed towards topics and tasks of real personal interest. Topics of discussion within a computer conference are typically course focused and instructor directed. Student involvement usually consists of posting ideas and responses on assigned topics. It has been argued that the computer conference can act as an

"equalizing tool, which encourage(s) universal participation in discussion compared to face-to-face dialogue" (Godwin-Jones, 2003) indicating that all participants have the ability to initiate new topics or discussions. This "decentralization allows for more emergent and unpredictable directions that may reflect the group's desires as a whole" (Lefever, 2004). In practice however, conference postings are permeated by the educational and usually institutional context of the delivery institution. This facilitates social presence if one is comfortable in exposing and hopefully developing themselves in an educational context, but can be intimidating and even repressive to the expression of one's real self. This sense of institutionalized attitude and behaviour is one of the hidden agendas of all forms of education including that delivered online (Anderson, 2001).

Blogs are personal, learner focused tools that are designed for learner directed and orchestrated activity. A blogger has the ability to determine subject matter, customize design, organize content, edit current and past work, and delete unwelcome comments from the blog space at will. Blogs can simultaneously be focused on the educational application, while still retaining the self-directed, internal focus of the owner. For example, the blog enhances social presence by exposing the learner's affective response through the self disclosure evident in the earlier, perhaps unrelated postings, the links and the graphics they chose to exhibit on their blogs.

Identity

Social presence, with its focus on freedom to express one's true nature, is dependent upon the learner being able to create a sense of their personal identity. The development of identity through blogging has a number of contributing factors including permanence, personal responsibility, control over content and writing for an infinite audience. Due to the persistent nature of blogs, learners get a chance to develop an online identity over time and that voice can be reviewed via the automatic archiving of previous posts. The blogger's "voice" will develop as he or she continues to practice the skill of writing and becomes more comfortable with the medium. Ownership of a publicly visible space like a blog encourages a strong personal connection with the material presented and a desire to create identity that simply cannot be replicated in a course discussion board which lacks personal space.

A blogger's identity will develop through continual interaction with online content and ideas. Hoem and Schwebs (2004) state that "being responsible for one's own blog implies that a person writes for himself, but is aware that he also publishes for a public audience… a blog is very well suited for mediating a role that a person – conscientiously or not – wants to play while facing other users." Students who blog are writing for an audience beyond that found in a typical course computer conference thus have a greater potential for the development of identity. Godwin-Jones (2003) observed students' writing in blogs and argued that "self-publishing encourages ownership and responsibility on the part of students, who may be more thoughtful (in content and structure) if they know they are writing for a real or infinite audience. This same degree of personal responsibility is lacking in discussion forums." One can dispute whether classmates in a formal course of study are in fact a 'real audience' or not. However, Cohen and Riel (1989) reported that the quality of their students' work improved when preparing it for distribution beyond their class.

Ferdig and Trammell (2004) discuss the public nature of educational blogging and argue that, "blogging opens up assignments beyond the teacher-student relationship, allowing the world to grade students and provide encouragement or feedback on their writings." The infinite potential for comment on their work can be at once intimidating and encouraging for learners and will have implications for how learners want to be perceived by this larger audience. Widening of the audience obviously affects the potential for developing identity but could also result in exchanges that may negatively impact learner confidence as their words are released to anyone on the open Net.

Safety

One cannot project one's 'real' self and establish social presence unless one has a feeling of safety, whereby users have reasonable expectation that their input will not be ridiculed or result in their prejudicial or unfair treatment. The closed conferencing environment is inherently a safer and more secure environment than the distributed (and often public) postings on a blog. Some blogging systems (notably elgg.net) allow selective release of posting such that they are only distributed or syndicated to selective audiences (such as those enrolled in a particular course or authenticated by a particular school logon system). In this case the blogging environment comes closer to providing the closed and secure context of the computer conference. For the most part, control of the security of the system has devolved to the individual student (they choose with whom to syndicate their responses). Leaving control in the hands of the blogger does increase the potential for loss of data through unsecured or improperly backed up blog environments and unauthorized distribution beyond the intended audience increases.

The ability to close comments on specific postings and to delete any unwanted comments can add a feeling of safeness within the blog environment. LeFever (2004), who calls this ability "pollution control", argues that the value of a blog then shifts from comments made to ideas presented. The blogger can actually free him or herself from potential criticism and, in the protective place created within the blog, has the opportunity to develop an online identity that projects their true personal or professional self.

Style

Connected to the development of an online identity or 'real' voice is the use of a specific writing and presentation style. Blogs can include everything from bulleted lists of links to fully polished, ready for publication, academic papers (or at least within the presentation constraints of HTML). It is up to the user to determine the best writing style or format depending on the information being presented. Blogs are personal but they are also intended to be read by an audience so the most readable blogs combine a variety of writing styles to retain reader interest (Gahran, 2004).

In computer conferences, the writing style usually depends on the assignment and tone dictated by the instructor. Conferencing space (like blog space) can however be used to present different genres of writing, such as reports, reviews, debates or stories for instructor or peer comment. Learners often use a more formal style and tone if the assignment is to post a review of a reading but a conversational style of writing is usually the norm as students post answers to direct questions and rebuttals on a course computer conference. Writers in a course conference will generally conform to the style, tone or format expected by a particular assignment while bloggers are generally more free to determine the overall style of their postings and their blog.

Beyond the written word, bloggers have a variety of options for customizing including changing colour schemes, adding images, sound files and links to other communication media, categorizing of blog postings and including blogrolls[5]. Farmer (2004) also notes the capacity for "photo", "audio" and "video" blogging to enhance social presence. This ability to develop personal style is evident in Stephanie Neilson's blog (http://www.sumofmyparts.org/blog/) where she has adopted the punctuation style of author E.E. Cummings as one of the ways to add to the unique nature of her blog. A look through the blogs of the "pioneer edbloggers" listed on Farmer's edublogs.org site, http://educational.blogs.com/edbloggerpraxis/, gives a glimpse of how some other notable educational bloggers have stylized their blogs.

Ownership of Space

Social presence is also constrained by ownership of space. When a learner registers for an online course that uses a LMS they are typically connected to course material including a course syllabus, activity calendar, reading material, and a discussion area organized by course content or structure. Learners do not own or occupy one specific area of the system. Learners contribute to

computer conferences but discussion areas are closed upon completion of the section or topic and typically all discussion material is removed from the LMS at the end of the course. There is no easy means for storing or compiling data for reflection or revision over a sequence of courses or over the long term.

Learning through distributed connection with a learner blog is a very different experience. A learner names, designs and builds their blog. The learner is then free to use the blog as they wish. They may be directed to use the blog for course related activity but the very nature of blogging allows learners the freedom to take ownership of the blog space and use it to organize and write about any area of interest, both personal and education related. Bloggers have control over all content and can edit posts or delete comments at any time. Most blogging software allows the user to restrict access to blog postings so learners can leave work in progress in "private" postings and can, in this way, use their blogs as online editing spaces. This level of control over the usage of space is absent on discussion boards where a learner is simply following the rules and patterns of the institutionalized computer conferencing space.

Farmer argues for the importance of learner control as an essential element of "fostering appropriation of the technology for unintended uses" (Farmer, 2005). Squires (1999) originally coined this way of designing software as "incorporated subversion" and described this design as follows:

> *Rather than design with constraint in mind, design with freedom and flexibility in mind … this emphasises the active and purposeful role of learners in configuring learning environments to resonate with their own needs, echoing the notions of learning with technology through "mindful engagement". (p.1)*

This freedom easily translates into the capacity to develop and share social presence. At first glance, blogging seems to simply be an independent activity – a way to create a private, online diary or journal. However, given the freedom to control a blog's content, design, appearance, organization, and more, the user can turn what appears to be a simple journaling tool into a highly personal, dynamic and reflective online learning space.

Farmer (2004) also argues that the development of social presence is further limited in computer conferencing because the learner is uncertain to whom he or she is trying to project themselves to – just the instructor, a group, an individual student or just self reflection. However, it can be argued that this uncertainty of audience is an even greater factor in a blog composition. Uncertainty about the receiving audience impacts, in often exciting ways, the communication style and content of the writer. However, Farmer (2004) suggests that bloggers are "writing to their own area and context"; the blogger writes for him or herself, to a potentially infinite audience who is interested (hopefully) in similar topics. So, in essence, the blogger is forced and offered the opportunity to create their own mental image of their audience. In writing for this audience the blog author is developing what Hoem and Schwebs (2004) refer to as "media competence". This issue of effective distribution is also apparent in the development of cognitive presence to which we turn next.

Cognitive Presence

Our conception of cognitive presence grew from Vygotsky's (1978) theory of social construction of knowledge, Dewey's (1933) practical inquiry models and Garrison and Anderson's (2003) notions of phases of the development of critical thinking. From each of these theoretical constructs emerges a sense that cognitive presence needs to develop within a collaborative environment in which triggering ideas are introduced, explored through discussion, then integrated and finally resolved through application.

Triggering Cognition

The initial generation of topics is usually teacher directed in a computer conference and self-directed in a personal blog. However, when blogs are used in educational settings and topics are dictated to students in the same fashion as in a computer conference is there any difference in the cognitive process that follows? For the purpose of this discussion let us assume that blogs, even in educational settings, are being used in a fashion to allow for the emergence of their subversive nature (Farmer, 2005). Therefore, students may be asked to blog on a general topic or area of interest but are not directed to blog on specific questions or narrow teacher-defined topics.

Exploration

This element of cognitive presence depends on personal reflection as well as social exploration. A breakdown in the cognitive process can occur at this point regardless of the communication medium in use. Often learners respond to a topic without taking the time to explore and develop, in a critical manner, ideas on the issue. Learners in a classroom discussion are typically expected to respond to topics based on their immediate knowledge. They learn though the information exchange process but the discussion is typically not influenced by sources external to the classroom. If learners have not kept up with course readings or activities, classroom discussions can break down or lack effectiveness. However, the asynchronous nature of communication in discussion boards and blogs allows learners the opportunity to explore a topic before responding, potentially leading to a more complex level of discussion. Learners who take time for reading (Richardson, 2004) and reflection before writing will probably contribute well informed, interesting and readable posts.

Blogs are implicitly tools for reflection and journaling. Unlike computer conferencing posts, there is no need to start with the final product in mind when posting to a blog. Learners can start with initial ideas that can be edited or added to over time or entirely new posts on the topic can be initiated at any point. There is an expectation in course conferences that students have done their reflective work offline and that postings to a discussion board represent the learner's formal understanding of the topic. Not only does this impact how blogs and discussion board postings are written but it also impacts how they are read.

Many educational blogging researchers have indicated that the ability to use blogs as both writing and reading tools could have a transformational effect on learners. Will Richardson (2004, in Downes, 2004) asks the question, "Could blogging be the needle that sews together what is now a lot of learning in isolation with no real connection among the disciplines?" and suggests that blogging has the potential to teach learners "how" to learn. Stephen Downes argues that "despite obvious appearances, blogging isn't really about writing at all; that's just the end point of the process, the outcome that occurs more or less naturally if everything else has been done right. Blogging is about, first, reading. But more important, it is about reading what is of interest to you: your culture, your community, your ideas" (Downes, 2004).

Farmer (2004) indicates that "access to experts and other professionals beyond the boundaries of the classroom environment has been perceived as one of the most valuable aspects of the blog publishing activity." The process of reading and commenting, and in turn writing and receiving feedback, is essential for social exploration. It is in this capacity to organize and display feedback that conferencing is yet superior to blogging. The technical abilities of blogging software to support discussion, such as RSS, trackback and pingback, offer rudimentary support for interaction, but it is currently more difficult to track, sort, query and aggregate postings distributed across a large number of independent blog sites than those posted in the confined technical space of a single threaded discussion system. However, we expect developments in this field as automated and semantically based tagging and aggregation tools are developed and implemented.

Integration

Once learners have had opportunity to investigate and reflect on a topic they are ready to construct meaning from new ideas in a process that continually involves reflection and interaction. In formal education contexts, some form of teaching presence is critical for encouraging and modeling this critical thinking process. Teaching presence takes a more traditional form in computer conferences where instructors and fellow students have the ability to question, comment and inform learners. In blogs, teacher presence is much less tangible since focus of individual postings may diffuse beyond the topics instigated by the teacher and the challenge of effective aggregation may mean that not all students are following and reading teacher posts and comments to the posts of others. However, blogs are platforms where learners have the possibility of interacting with peers, teachers, researchers, significant outsiders on a level that goes beyond one topic or one course. In his conference paper, "Weblogs and Discourse", Wrede (2003) claims that blogs promote discourse while online conferencing systems encourage discussion. In differentiating between the two, Wrede (2003) describes discourse as being about making connections between ideas, people and communities, possibly using several media over time that continues until participation stops and describes discussion as an instance of debate or dialogue on a topic.

Farmer observes this difference as well and describes how the level of discourse found in some blogs fits into the culture of academic writing:

> *Certain research (Herring et al. 2004) across the blogging spectrum has indicated that there is a possibility that weblogs encourage significantly more in-depth and extended writing than communication by email or through discussion board environments and yet less extensive than more formal modes of publication, producing in an academic sense a kind of discourse somewhere between the conversational and the article. (Farmer, 2004)*

Blogs not only have the potential for high levels of external communication but also "offer a way to engage in a discursive exchange with the author's self (intrapersonal conversation)" (Wrede, 2003). A blog needs to be treated as an active participant in the discursive process. Wrede (2003) argues that, without continual, consistent attention a blog loses its dynamic nature and takes on characteristics of a regular Web site. In essence, blogging works when a blog is 'fed' through reading, writing and making connections to information, individuals and groups throughout the blogosphere and beyond.

Mejias (2006), in a blog posting entitled "The Blog as Dissertation Literature Review?", discusses the potential for blogs as tools of discourse and for academic research. He proposes that chronological sequencing, categorizing of postings, ease of publishing and editing options make blogs technically sound research tools. Mejias (2006) also highlights the pedagogical potential that blogs possess for enabling collaboration with a wider audience throughout the process of developing a literature review. In a related way Anderson (2006) blogs about the use of a blog as a precursor and stimulation to more formal academic publications in his post 'Blogging as an Academic Publication". In these cases, both the blog's writer and readership could be connected to and influence the research process as it develops.

Richardson (2004) describes blogging as a genre of writing itself which have "great value in terms of developing all sorts of critical thinking skills, writing skills and information literacy among other things." The elements of this new genre as he sees it include the ability to "a) reflect on what they are writing and thinking as they write and think it, b) carry on writing about a topic over a sustained period of time, maybe a lifetime, and c) engage readers and audience in a sustained conversation that then leads to further writing and thinking." (Richardson, 2004) The potential that blogs offer for persistent activity and connectivity clearly distinguishes them from course discussion boards.

Resolution

One of the surprises uncovered in our studies of the *Community of Inquiry* model with regards to computer conferencing was the relative low rate of the final, application phase of critical thinking (Garrison et al., 2001). Kanuka and Anderson (1998) attribute this in part to "the democratic nature of the medium and the way it is used" and to the "sharing and comparing nature" of most computer conference exchanges. The blogging environment is situated outside of the somewhat artificial environment of formal learning. Thus, bloggers can be expected to focus more on actual application and testing of ideas developed through discourse and on real world problems and applications. Further, since contributions may be made in a more public context, they are more likely to be read and tested by others who are removed from this artificial domain of higher education.

Computer conferences are now commonly situated as a component of a larger learning management systems and the Web. Thus, they are connected with other sources of knowledge beyond the discussion board. With modern Web based conferencing systems, as with blogs, students can easily incorporate links and references to such external resources, thus encouraging readers to move beyond the confines of a closed discussion. However, discussions on conference boards are still typically confined to other enrolled students. Since knowledge construction has never been confined to formal classrooms this external potentiality adds to the possible development of cognitive presence in blogging contexts. This of course raises issue of privacy and of the value (or not) of safe spaces outside of the purview of the open Net. Further empirical research is needed to compare the development of cognitive presence in blogs as compared to computer conferences, but the critical application component may well be enhanced in the more public context of the blogosphere.

Teaching Presence

What perhaps most vividly differentiates formal education from self directed learning (besides tuition fees!) is teaching presence. Note that from our earliest use of the term we spoke of teaching presence – not teacher presence – thereby acknowledging that teaching presence can and often does, especially in graduate classes, emerge from students as well as teachers. Teaching presence indicators include activities related to design and organization, facilitating discourse and direct instruction.

Blogs are native to the Internet and thus are inherently linked to learning objects, syndicated postings from mass media outlets, and distributed databases. Computer conferencing emerged in an era that predates the Web, thus the tendency is for use that is separated from Internet resources and focuses on discussion of readings, or activities that take place off-line or behind passwords. Second, course design tends to use only those set of tools that are contained behind the password of closed Learning Management Systems (LMS) systems. This means that the design of LMS based courses tend to exclude use of emerging Internet tools such as collaborative bookmarking, FOAF, podcasting, synchronous web conferencing and other social software and external database systems. Thus, the design and organization component of teaching presence is generally more restricted when LMS based conferencing systems are used as opposed to blogging tools.

The current generation of blogging tools were not designed for closed class courses and thus the component of teaching presence referenced as facilitating discourse is in some ways more challenging in a blog environment. Richardson (2004) notes how a teacher can establish a page in which the syndicated feeds from each of the registered students in a class can be viewed. However, threading by distinct topic within these feeds is not permitted and thus the discussion may be more challenging to follow. We have also found that RSS aggregation works for displaying blog posts in chronological order, but does not usually draw the reader's attention to new comments added to these postings. Some LMS systems also offer tracking services that

allow a teacher to see when messages have been read by respondents. This is not possible in most of today's blogging environments.

Finally teaching presence requires direct instruction whereby the subject matter knowledge of the teacher is shared with the students. The form of this instruction may be didactic postings, multimedia presentations or more Socratic questioning. In all cases the teacher's input is often necessary for feedback and for motivation to look deeper into tentative solutions and applications of knowledge. In formal education learners are required to read and often to comment on blog posting of other students in a class, often using RSS and other syndication tools. This form of reciprocal syndication is more complicated than normal default membership in conferences that are established and managed by the teacher in a standard LMS system. The posting of instructor interpretations, guidelines, feedback and insights to the content is relatively similar in either blog or conferencing contexts. However, teacher presence may be more publicly exposed and have longer persistence in an open blogging context, possibly giving rise to copyright infringement concerns.

Conclusion

In an editorial on technology and lifelong learning, Koper (2004) highlights factors that should be driving the development of educational technologies. Koper (2004) cites the need for tools that facilitate lifelong learning – learning that creates a network of knowledge that entwines work, formal education or personal interests and that focuses on learning how to learn and the application of that learning over a lifetime. As noted in our discussion, blogs have many pedagogical and technological aspects that make them suitable tools for this type of lifelong learning. Lifelong learners could blog to record thoughts and experiences over time, to build and maintain connection with peers, to compile resources and to create a body of knowledge representative of personal growth and achievement. Whether blogs are incorporated into formal courses, included on the periphery of a course of study or used as purely individualistic tools for personal learning, bloggers will reap the benefits of their use over time - becoming better readers, writers and better self-directed learners. To build on the sentiments of Downes (2004) and Richardson (2004), effectively using blogs to reinforce these skills will involve learners in an experience that can be draw upon over their lifetime.

With regard to the comparison of blogs with discussion boards, it may be time to move past the debate – each have specific strengths and it is possible that the best of both could be combined into a very effective learning tool[6]. The lifelong learning potential inherent in blogs makes them attractive to education professionals. If learners have an opportunity to experiment with blogging they can make a decision about its potential for future learning. Some will be motivated by the experience of blogging and adopt it as part of their learning landscape while others will be motivated to move on to others tools that are more in line with their learning styles.

Notes

[1] Blog Herald Blog Count February 2006 http://www.blogherald.com/2006/02/02/the-blog-herald-blog-count-february-2006-200-million-blogs-in-existence/

[2] "RSS: A Quick Start Guide for Educators" by Will Richardson available at http://static.hcrhs.k12.nj.us/gems/tech/RSSFAQ4.pdf

[3] Search titles on these topics at amazon.com

[4] See communitiesofinquiry.com for links to various contributions to this work

[5] A blogroll is a collection of links to other weblogs. (Wikipedia definition)

[6] Blogging capabilities are currently being added to many LMS's and group blogging tools have the potential to include threaded discussion options. However, the implications of these developments go beyond the scope of this paper.

References

Anderson, T. (2001). The hidden curriculum of distance education. *Change Magazine, 33 (6)*, 29-35.

Anderson, T. Blogging as academic publication. Retrieved October 26, 2006 from http://terrya.edublogs.org/2006/03/09/blogging-as-academic-publication/

Cohen, M. & Riel, M. (1989) The effect of distant audiences on students' writing, *AERA Journal*, 132-159.

Dewey, J. (1933). *How we think, a restatement of the relationship of reflective thinking to the educative process*. Boston: D.C. Health.

Downes, S. (2004) Educational Blogging. *EDUCAUSE Review. 39(5)*, 14–26. Retrieved October 26, 2006 from http://www.educause.edu/pub/er/erm04/erm0450.asp

Downes, S. (2005) E-learning 2.0. *E-Learn Magazine*. Retrieved October 26, 2006 from http://elearnmag.org/subpage.cfm?section=articles&article=29-1.

Farmer, J. (2004) Communication dynamics: Discussion Boards, weblogs and the development of communities of inquiry in online learning environments. Retrieved October 26,2006 from http://incsub.org/blog/2004/communication-dynamics-discussion-boards-weblogs-and-the-development-of-communities-of-inquiry-in-online-learning-environments

Farmer, J. & Bartlett-Bragg, A. (2005) Blogs @ Anywhere: High fidelity online communication. Retrieved October 26, 2006 from http://incsub.org/blog/2005/blogs-anywhere-high-fidelity-online-communication

Ferdig, R. & Trammell, K.D. (2004) Content delivery in the blogosphere. *The Journal*. Retrieved October 26, 2006 from http://www.thejournal.com/articles/16626

Gahran, A. (2004). Blogging style: The basic posting formats (Series Index)". Contentious, Retrieved October 26, 2006 from http://blog.contentious.com/archives/2004/09/22/blogging-style-the-basic-posting-formats-series-index#more-340

Garrison, D.R., Anderson, T. & Archer, W. (2000). Critical Inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education. 2(2-3)*. 87-105. Retrieved October 26, 2006 from http://communitiesofinquiry.com/documents/CTinTextEnvFinal.pdf

Garrison, D. R., Anderson, T. & Archer, W. (2001). Critical thinking and computer conferencing: A model and tool to assess cognitive presence. *American Journal of Distance Education, 15(1)*, 7-23.

Garrison, D. R. & Anderson, T. (2003). *E-Learning in the 21st century. A framework for research and practice*. New York: Routledgefalmer.

Godwin-Jones, B. (2003). Emerging technologies Blogs and Wikis: Environments for on-line collaboration. *Language Learning & Technology. 7(2)*, 12-16. Retrieved October 26, 2006 from http://llt.msu.edu/vol7num2/emerging/default.html.

Hoem, J. & Schwebs, T. (2004) Personal publishing and media literacy. Retrieved October 26, 2006 from http://www.infodesign.no/artikler/personal_%20publishing_media_literacy.pdf

Jones, G. (2006). The Skinny on Web 2.0. *InformationWeek*. Retrieved October 26, 2006 from http://www.informationweek.com/story/showArticle.jhtml?articleID=1930010266

Kanuka, H., & T. Anderson. (1998). Online social interchange, discord, and knowledge construction. *Journal of Distance Education 13 (1)*, 57–75.

Koper, R. (2004). Editorial: Technology and lifelong learning. *British Journal of Educational Technology, 35(6),* 675-678.

Lefever, Lee (2004) What are the differences between message boards and weblogs? Retrieved October 26, 2006 from http://www.commoncraft.com/archives/000768.html.

Mejias, U. A. (2006). The Blog as dissertation literature review? IDEANTS, Retrieved October 26, 2006 from http://ideant.typepad.com/ideant/2006/01/the_blog_as_dis.html

O'Reilly, T. (2005) Compact definition. O'Rielly Radar. Retrieved October 26, 2006 from http://radar.oreilly.com/archives/2005/10/web_20_compact_definition.html

Richardson, W. (2004) Metablognition. Weblogg-Ed. Retrieved October 26, 2006 from http://www.weblogg- ed.com/2004/04/27.

Richardson, W. (2004) Reading and blogging. Weblogg-Ed. Retrieved October 26, 2006 from http://www.weblogg-ed.com/2004/03/31.

Rourke, L. & Anderson, T. (2002). Exploring social presence in computer conferencing. *Journal of Interactive Learning Research, 13(3),* 259-275, at http://www.aace.org/dl/search/files/JILR133259.pdf, accessed 10 September 2002.

Squires D. (1999) Educational software and learning: Subversive use and volatile design. Retrieved October 26, 2006 from http://csdl2.computer.org/comp/proceedings/hicss/1999/0001/01/00011079.PDF

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Wrede, O. (2003) Weblogs and discourse. Weblogs as a transformational technology for higher education and academic research. Blogtalk Conference Paper. Retrieved January 2006 from http://weblogs.design.fh-aachen.de/owrede/publikationen/weblogs_and_discourse

About the Authors

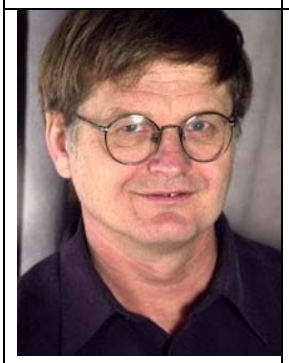
Donna Cameron

Donna Cameron is a graduate student in the Master of Distance Education program at Athabasca (http://cde.athabascau.ca/) University in Canada. The focus of her thesis work is Social Software in Education.

Donna Cameron
Graduate Student, Master of Distance Education
Athabasca University
PO Box 2603
Fernie BC Canada V0B 1M0

250-423-2603 donnacam@telus.net (publish)

250-423-2604



Terry Anderson

Terry Anderson is a professor and Canada Research Chair in Distance Education at Athabasca University – Canada's Open University.

Terry Anderson, Ph.D.
Editor, International Review of Research on Open and Distance Learning
Professor and Canada Research Chair in Distance Education
Athabasca University
#1200 10011 109 St
Edmonton AB Canada T5J 3S8

Ph. 780 497-3421 Fax 780 497-3416 terrya@athabascau.ca (publish)

http://cider.athabascau.ca/Members/terrya/

Editor's Note: The gulf between classroom learning and real world practice is a challenge in professional training. This is especially true where human life and health are involved. This research addresses the learner motivation and experience through role-playing games to provide experience beyond the classroom.

The Design and Evaluation of Virtual Situation Role-Playing Learning Game (VSRPG)

-- Legend of Shannon --

Ju-Ling Shih, Bai-Jiun Shih, Rey-Long Chen

Taiwan

Introduction

Conventional education of medicine is mostly based on lectures because it is a subject with structural knowledge. The mastery of the subject relies heavily on learners' memorization and use of references. The content is mostly categorical and indexical, compiled in bulky professional directories and dictionaries within its own chapters and sections so that it can be easily searched and referenced. In the medical profession, precision is a necessity and an obligation because human life is at stake. However, the customary repetitive style of teaching, and progressive recitation toward effectual learning can easily cause the regression of learning motivation.

Limited opportunities for students to transfer textual knowledge to practical situations and integrate knowledge and applications into real-world environments can result in learning that is static and ineffective. Digital technology provides educators an alternative to fill this gap. Using it as an appropriate supplement to the classroom lectures, learning can be more interesting and motivating. The goal is to find a balance between conventional and innovative forms, in which the value of traditional teaching methods can be preserved, at the same time maximizing opportunities for knowledge exploration and expansion.

As the trend of technology-mediated education continues, the Taiwan government is taking actions to promote digital learning projects in all fields, such as the National Digital Archive Program (http://www.ndap.org.tw/). In the realm of health education, the Department of Health, Executive Yuan in Taiwan has established an informational medical education network to prevent abuse of club drugs. It integrates e-learning materials and activities in the form of virtual simulation. It replicates the feelings, symptoms, behaviors, and the side-effects of misapplied drugs, and suggests methods and channels to the users for solutions. Simulation is used to attract youths to foresee the results of the misuse of drugs, the e-learning materials help them retrieve more information online and indirectly reduce these medical problems (Hsu, Wang, & Chien, 2004). In a related area, development of an E-learning-based rehabilitation system for mental disorders is in construction supported by government funds (Chian, Sung, Yang, & Yei, 2004).

In response to the need to implement a digital system for the education of medicine, this research posits the development of a simulated situation learning model. Knowles (1996) suggests that adults are more self-directed, goal-oriented, intrinsically motivated than children. The target is a fundamental college course of Chinese medicine to focus on Chinese herbal medication safety. The simulation is a multimedia game based on constructive learning theories to provide situations in learning environments that embed "learning in realistic and relevant contexts" (Hobebein, 1996, p. 11). The goal is to stimulate motivation and learning and create opportunities for students to synthesize their textual knowledge into life situations. Empirical studies of the implementation of situated learning in professional training (e.g. Artemeva, Logie, & St. Martin,

1999; Wolfson & Willinsky, 1998) confirm its effectiveness for helping participants to translate knowledge and skills to the future real works.

Games used in education must be high-quality to motivate and interest users, otherwise their effect will be lost (Elliot, Adams, & Bruckman, 2002). Therefore, a central concern of this research is how to design a successful digital game for educational purposes. A Virtual Situation Role-Playing Game (VSRPG) was designed to explore innovative ways for teaching and learning to supplement classroom learning. This paper describes the processes of design, development, implementation and evaluation to demonstrate the potential efficacy of a VSRPG as a tool for medical education.

Literature Review

There are four basic reasons why we introduce computer games to educational practices: natural activity and tendency for learning, content-based scenario, social functions, and active participation. All of these require elaboration and discussion.

First, let us delve into natural activity and tendencies for learning. Play, in its diverse forms, constitutes an important part of human cognitive and social development (Csikzentmihaly, 1990; Rogoff, 1990), and can be considered as an excellent example of situated learning. It has a strong influence, especially on children (Piaget, 1951; Vygotsky, 1976). However, “games” in this research refer to not aimless “play” but a goal oriented set of properties, rules and processes. A mental framework is generated in the gaming process when players deal with goals, conditions, rivals, and problems in the game. An understanding of the underlying concepts of games plays an important organizing role in cognition, similar to that of a story schema (Schank, 1990).

In America, digital games are more prosperous in business and entertainment than in education; nevertheless, a few games, such as SimCity, Carmen, SanDiego, and various Multi-User Dungeons/Dimensions (MUDs/MOOs) have been used effectively for education (Perrone, Clark, & Repenning, 1996). WebQuest, for example, a learning environment combining the Internet and virtual reality, is widely used in various schools for inside and outside of class activities. Even Nintendo has demonstrated its effects in education in assisting students to improve their literary and algorithm ability (Rosas et al., 2003).

The second reason for using computer games in education involves content-based scenarios. Scholars (e.g. Ausubel, Novak, & Hanesian, 1978; Papert, 1980) propose that people best construct new knowledge when they are engaged in personally- meaningful tasks that corresponds with students’ interests. Therefore, the instructional tools must approach students from an angle that seems interesting and relevant to them (Kafai, 1995; Provenzo, 1991)

Computer games were traditionally classified as strategy games, multiple-user dungeon (MUD) games, simulation games, role-playing games, shooting games, and online games. Basic games, such as dartboard, crossword puzzle or roulette wheel, are extrinsic games that have nothing to do with the content of a course. They are fun because they are competitive and add tension to the training experience, but they add little if anything to the skills or information being taught (Fister, 1999). Brandt (1996) recommended that program content and activities should be based on typical practice situations, such as discussion of case vignettes with multiple interacting variables, and working through complex problem-based cases. “True learning involves experimentation and reflection both in the virtual world and the real world” (Senge & Fulmer, 1993). An intrinsic approach, which uses the content as the basis for a game, is linking the fun to the content in such a way that playing the game actually increases the learning effectiveness instead of just testing recall of the information delivered earlier (Fister, 1999). As McFarlane et al. (2002) state, “computer games provide a forum in which learning arises as a result of tasks stimulated by the content of the games, knowledge is developed through the content of the game” (p. 4).

The third reason arguing for computer game use in education revolves around social functions. In the game world, the drive for realism and dramatic fantasy demands some of the most sophisticated software, hardware, animation and graphic design performance standards in the information and communication technology domain (Kim, Park, Kim, Moon, Chun, 2002). Many game designs simply focus on creating the excitement that game-play brings. In fact, designers need to pay more attention to building psychological involvement in online games. "In single-player game, players are looking for a good solo experience, on the other hand, online players are looking for opportunities to have a good time competing and/or cooperating with other humans" (Mulligan and Patrovsky, 2003, p.9). Social functions are key characteristics that appeal to online game players. The social behaviors exhibited by players within games have made game design even more challenging.

The fourth reason is based on active participation in tasks, which is the main characteristic of computer games. Pea (1987), addressing the problem of knowledge transfer, argued that formal education tends to separate knowledge from its everyday use without linking the content of first acquisition to the use of knowledge beyond the contexts. It causes students to only be able to solve specific problems they have been taught. He suggested that educators ensure the construction of learning settings to support the use of concepts, skills, and strategies in everyday life and work situations. Therefore, by using role-playing games, every player plays his or her own part, takes individual responsibilities, practices real-life simulated tasks, and experiences the consequences of every decision, rewards or punishments, in the games. Learning by doing and learning from mistakes is how humans learn since infancy. Building an "edutainment" environment facilitates learning because students direct their own goals, progress in their own way, in their own speed, and practice successful transfer of knowledge and skills from classrooms to the real world. Computer games are a means to build that bridge and channel it.

Friedl (2003) thinks all gaming environments can provide learners opportunities to participate and discover knowledge in different fields with various aspects. In the game, they learn functions, features, and concepts, and try to connect them forming a cognitive process. Such gaming environments, a kind of virtual reality, let participants practice dangerous tasks in a safe setting (p. 26). This learning process can induce an "immersion effect" (Hubbard, 1991) where players submerge themselves in the virtual environment, progressively increasing their levels of attention and concentration toward obtaining their goals. Relating to Csikszentmihalyi's flow theory (1990), players get into a state in which satisfaction occurs while they are absorbed by a certain activity. Although sometimes it can be alienating, it can also be a genuine opportunity for users to engage in the educational contents (Lepper & Malone, 1987).

The most common form of active participation is role-playing. Role-play has meaningful social functions. Due to the limited time and space of schools, education can hardly match the rhythm and range of real life situations. Role-plays in class increase students' participation in learning. However, it is not easy to provide all students the opportunity to engage in role-play activities. Now with technology, simulated real life situations can be experienced on the computers. Computer games have created a unique world to simulate the real one. All students can fully emerge in the situation and participate in the problem-solving process. Contrary to the passive mode of learning, learning becomes active and meaningful for each individual to create and construct his or her own meaning toward the knowledge they learned.

Role-playing games are often simulations with common characteristics such as a familiar and appealing theme, an interactive interface, a self-exploring environment, a strong and rich database of meaningful materials, imbedded professional knowledge, a requirement for diverse skills, and interesting and challenging features. However, simulation specifically refers to the similar environment and/or situations mimicking the real world. Although many simulations have the element of a role-play feature, many do not. On the contrary, in role-play games, most situations

are simulated to the real world in terms of the character definition, social organizations, and conflict resolutions. Often they are a microcosm of real life.

The game designed for this research, Legend of Shannon, is semi-fictional. Although most of the professional materials are based on historical documents and medical facts, many parts of the scripts are based on legends passed down from six thousand years ago. Consequently, the game produced by this research is defined as a "virtual situation game" instead of "virtual simulation" in order to emphasize its distinction. And to further stress its feature of role-playing, it is called a virtual situation role-play game (VSRPG).

Research Methods

This research followed the standard instructional systems design model, ADDIE, (Dick & Carey, 2005) having gone through the process of analysis, design, development, implementation and evaluation. Since this research is supported by the National Science Committee fund and involves personnel in cross-disciplines, we organized a series of design meetings and called for frequent small consultations as needed. For formative and summative evaluation of the production of the game, we used descriptive, quantitative and qualitative methods. A mixture of questionnaires and interviews were used during and after the formation of the game.

The first phase of the research was the analysis, design, and development of the game. The design team used existing game design guidelines to sketch Legend of Shannon. In order to obtain the original pedagogical goals, we started with the learner and content analysis to define the needs by discussing the content with course teachers and content experts. Learning content and gaming elements were planned throughout the game in the form of storyboards. Game maps, characters, and amenities were designed and developed, together with a series of formative evaluations and feedbacks. The major formative evaluation of the game was to ensure the quality of the product using heuristic evaluation.

The second phase was summative evaluation of the implementation and evaluation of the game. Students' learning was assessed in-class with 135 college freshmen in the Department of Pharmacy, Tajen University, who took their first fundamental course, Introduction to the Chinese Herbs. The pre-test pinpointed the students' background knowledge level. Then, they scheduled a 3-hour session to play the game after some fundamental classroom lessons on Chinese herbs. One week after they played the game, a post-test was conducted to evaluate their learning outcome. Scores were compared and students were categorized into "low-achievement", "average", and "high-achievement" students.

Four to five students from each of the three groups were selected to join the focus groups to explore intangible effects of learning activities embedded in the game. They were encouraged to freely talk about their feeling toward the game so that researchers could observe their meta-cognition of learning from the game.

All 135 students completed a questionnaire for game appraisals. In order to reach fuller understanding toward the intangible meaning of the effectiveness of the design, and at the same time triangulate the research finding, we coordinated reviews and interviews with experts in information management, educational technology, and pharmacy, to generate a list of recommended revisions.

Research Results

Phase One. Production of VSRPG

A. Design

Scholars (e.g. Fletcher, 1986; Malone, 1980; Provenzo, 1991; Turkle, 1984) named a few elements that are important for an enjoyable and successful computer learning game. Synthesizing from their research, we generate a list to include:

A) a decision maker, which is the player. Sometimes it can be done with fictional characters with whom players can identify or role-play;

B) a set of rules to define the choices of behaviors;

C) a set of meaningful, specific, and multiple goals that users must try to reach from which they can receive rewards and punishments;

D) incorporated instructions that users understand while playing the game without having to read textual instructions;

E) competition between players;

F) freedom of users of different levels to choose their own favorite playing modes -- an adequate level of complexity which is highly challenging but rarely totally mastered is an important component;

G) independence from physical laws of the universe where objects can fly, spin, change shape or color; use of emotionally appealing fantasy and metaphors;

H) random and uncertain outcomes;

I) an information system which can show the condition of playing.

This research is intended to design the learning environment of the digital learning game, Legend of Shannon, to provide opportunities for students to play roles in the virtual situation and explore the game using knowledge they learn in the classroom.

Certain key design features of computer games are found to affect student learning more strongly (Avezedo & Bernard, 1995; Sivin-Kachala & Bialo, 1994; Hung & Liu, 1992; Baltra, 1990; Lepper & Malone, 1987; Malone, 1980). A designer must pay attention to the following:

A) perceive students' knowledge background;

B) provide adequate, adaptive, and constant feedback;

C) incorporate cognitive strategies such as repetition, rehearsal, paraphrasing, outlining, cognitive mapping, drawing of analogies and inferences, and

D) use animated graphics, which increase achievement and reduce task time;

E) stimulate learners' motivation with two types of curiosity: sensory curiosity (audio and visual effects) and cognitive curiosity (surprises and constructive feedback);

F) give opportunity for users to apply learning skills and knowledge they gained.

The theme of this game integrates myths, legends, historical documents, and medicinal resources, using Shannon as the main character combating monsters and helping people along his journey, which though intended to aid his escape from the throne, actually results in his becoming more qualified to be the king. Shannon compiles his herbal journal along the journey, and passes it onto the posterity as Shannon Sutra. His story is called the Legend of Shannon.

Lave & Wenger (1991) said that the situated learning perspective emphasizes that learning processes are related closely to participation in the practices of a community. Shannon in the story tested Chinese herbs everywhere, risked his own life exposing himself to the poisonous plants, dangerous ground, and vicious monsters, but does not forget to take notes as he experimented with prescriptions on himself for the welfare of people. In order to shape students with a positive therapeutic attitude, the gaming nature is not only to kill monsters but also to heal villagers' sickness. The empathy toward others is very important for students in the profession of medicine. Having compassion to patients is much more important than mastering professional knowledge and skills, so Shannon can be called a good role model for students in the department of medicine.

Brown et al. (1989) have argued that the socio-cultural context in which learning is embedded is of crucial importance. The game is anchored on a complete story, hoping to connect students' classroom experience to the real life situation, and at the same time to stimulate players' motivation to continue try out their classroom knowledge in the game. Designing to suffice students' knowledge application ability, the game is depicted to occur on Wenshan Island (see Figure 1; Figure 2), where along the adventure, Shannon passes mountains, rivers, caves, and villages. In the journey, he interacts with the villagers, helping them to cure their diseases. Just as Lave and Wenger (1991) said, "Social learning is a creative achievement, therefore, which involves a degree of personal investment; it can only be achieved by active participation."

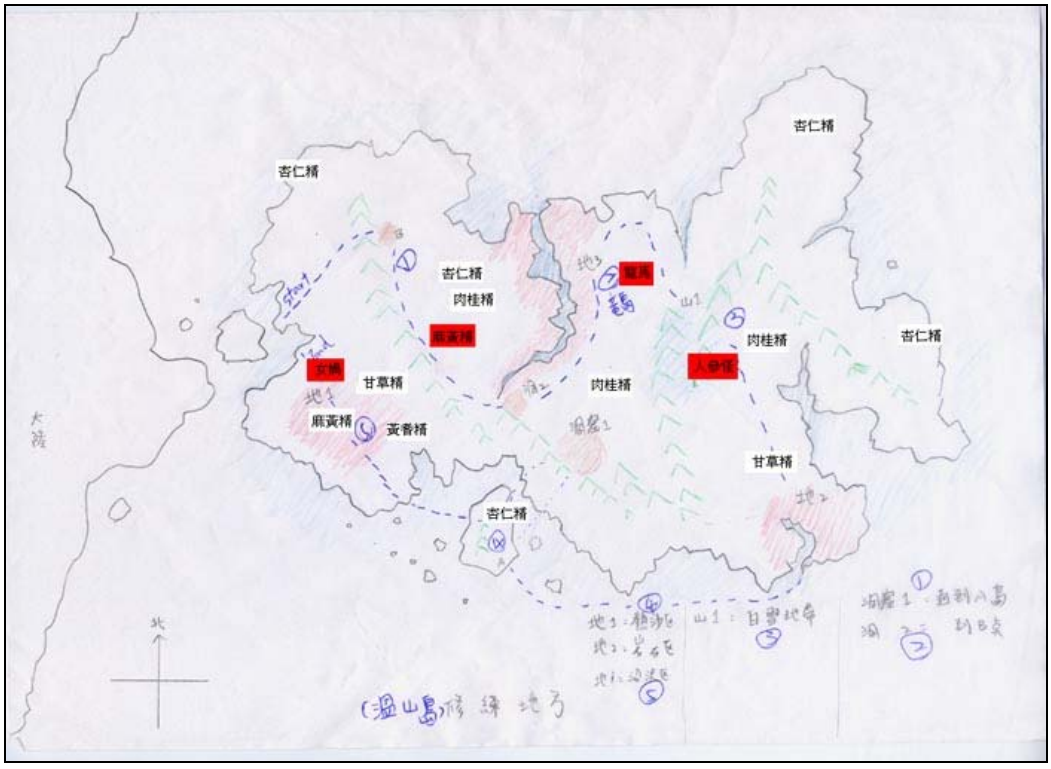


Figure 1：Game Map

* The game map describes Wenshan Island into which Shannon has gone for his escape. Five stages are located around the island. As Shannon gone through all five stages, he happened to return to the starting point where he finally comes to his throne.

The game is designed for college freshmen who are in their first school semester learning Chinese Herb Medication, thus the five stages of the game are based on their course content, and in progressive level of difficulties, within which some of the herbs are repeatedly used in different

prescriptions. The herbs are preliminary designed into five stages. The gate key in each stage is an herbal medicine prescription, namely Ephedra Decoction, Four Formulae Soup, Four-Articles Soup, Six Flavor Glutinous Rehmannis Pill, and Ten Assorted Tonic Soup. Players need to use their background knowledge and classroom knowledge on combining herbs to pass.

As the game progresses, the players repeatedly encounter these herbs. They must be very familiar with the herbs' respective effects and functions so they can apply it whenever it is appropriate in the tasks. As Schwen, Kalman, Hara, and Kisling (1998) refer to learning as a process of acquiring knowledge, these Chinese herbal medicinal, prescriptions, stories, and knowledge are embedded in the characters and tools. Other than that, in each stage, there is one big monster, such as Ephedra, Dragora, Ginsengia, Mo-White, and Queen NuWa (see Figure 3), and a few small monsters such as Almondia, Cinnamomia, Glycyrrhizia, and poisonous snakes. Spread out in the journey, there are also treasures, such as map, medical guide, red lash, Yun Nan White, etc.; and ploys, such as tharm-cutting grass, Chinese Soapberry Seed, and Chloranthi Serrati Radix, etc. Such design is to require users to apply their learned skills. When correct prescriptions are made, players game the pass to go the next stage, otherwise, their life power got deducted as they failed to make distinctions or over the challenges, as the system offers appropriate feedbacks to users of their progress.

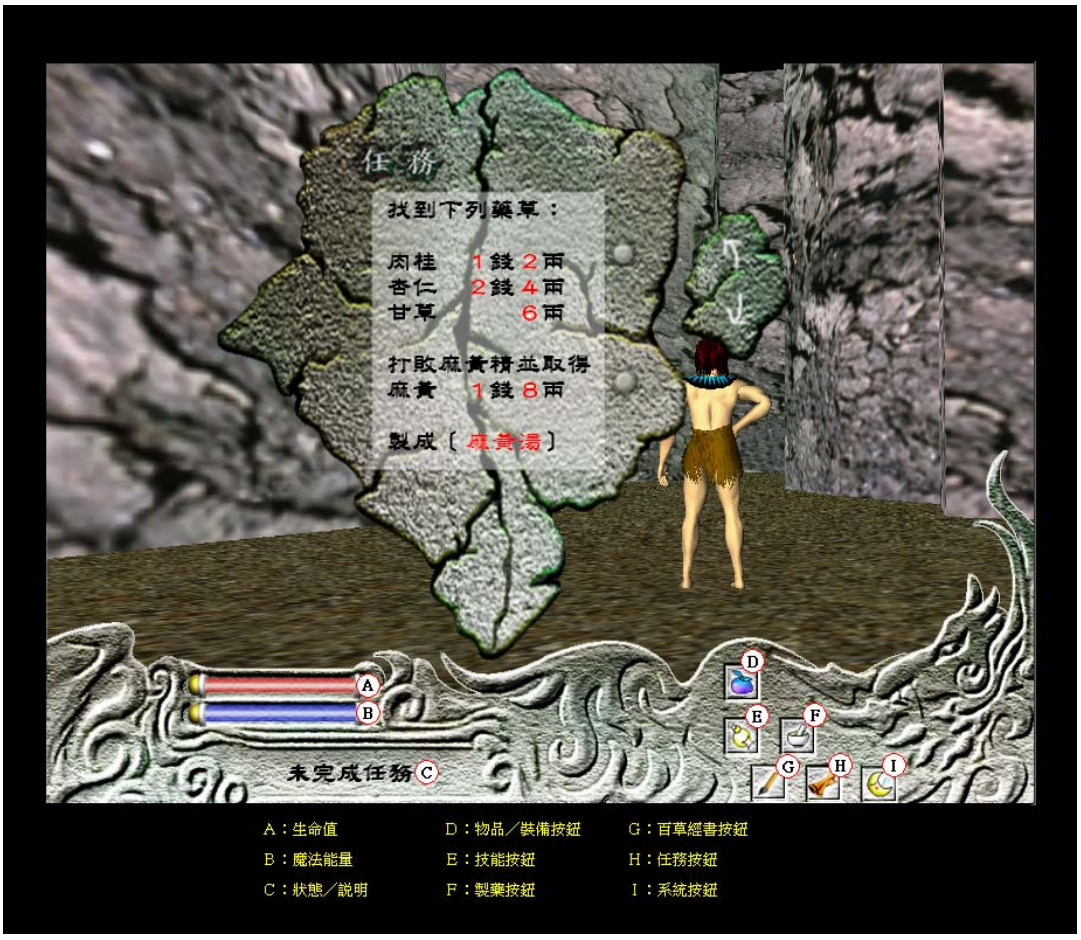


Figure 2: Game Interface 1

* The interface shows Shannon beginning to enter Wenshan Island. The game is designed by Virtool with which players can see 3D animations. Superimposed on top of the screen is the map of the island which shows the players location. In the middle of the dialogue box, it shows how much of each herb players has collected. Function control buttons are at the bottom of the screen.

Figure 3: Game Interface 2

* Shannon combating herb monster in order to retain “it” as part of his prescription.

B. Formative Evaluation

A good interface design comes from the designers’ understanding of both the technology and the users (Hackos & Redish, 1998). In the process of development, the heuristic evaluation was performed for formative usability tests which provided the team with constructive suggestions for improvements.

Heuristic Evaluation is a usability inspection method that targets interface design by judging compliance to certain “heuristic” principles for successful design. It is a type of formative evaluation, where users review the product's usability using the heuristics. They explore the system freely in their own styles according to individual interests and needs. The severity and extent of each problem was rated and hit statistics were generated to identify problems that were not previously perceived by the design team. The scales of severity and extent are as follows.

Severity Rating

1. Major usability problem: imperative to fix now
2. Major usability problem: important to fix now
3. Minor usability problem: give low priority
4. Cosmetic problem only: need not be fixed now
5. I don't agree this is a usability problem at all

Extent Rating

1. Widespread
2. Several places
3. Single case

We generated a customized heuristic for instructional technology design which was integrated and configured from the Heuristic Evaluation Guideline of Jakob Nielsen (1994), Levi and Conrad (2002), and Stanford University Information and Technology Systems and Services (2001). There are five aspects to observe, namely appearance, languages, functionality, structure, and assistance. The evaluation is not performed by programming technicians or interface designers, which would introduce unavoidable bias, but instead used selected target users to ensure the credibility of the evaluation. There are total of 25 heuristics.

The heuristic evaluation allowed us to find usability problems in the user interface design of the VSRPG so that these problems were taken into consideration in the design process. The formative evaluation cycles that led to detailed feedbacks and design adjustments were continued until the design was sufficiently mature for official implementation. The score comparison between first and last evaluation in severity are presented in Table 1.

Table 1

Heuristic Evaluation

Heuristics	Severity		Extent	
	First	Last	First	Last
I. Appearance				
1. Appealing interface. Colors and layout designs appeal to eyes, especially for long time viewing.	2.33	3.67	1.00	1.00
2. Aesthetic and minimalist design. Minimal irrelevant information in a dialogue to increase the visibility of options.	2.33	3.67	1.00	1.00
3. Readability. Text has high contrast for easy reading.	5.00	5.00	0.00	0.00
4. Intuitiveness of label functions. Symbols and features match user's expectations. Metaphors of icons, actions, and interface in general that enable users to instantly grasp the conceptual model.	3.67	4.00	1.00	1.00
5. Consistency in visual presentation within the site. Consistency between elements that have the same functionality.	5.00	5.00	0.00	0.00
6. Consistency of the site with platform conventions. Consistency of symbols and features between the platform and the interface.	5.00	5.00	0.00	0.00
II. Language				
7. Clarity of terminologies and symbols. Terminologies and symbols written in a natural and logical way without using jargons. Language using real-world conventions to prevent misunderstanding and confusion in the navigation process.	5.00	5.00	0.00	0.00
8. Consistency in terminology usage. Same terms are used to address the same meanings all the time.	5.00	5.00	0.00	0.00
9. Availability of descriptive information. Sufficient descriptions to words and symbols to assist the understanding of the nature of links and categories.	3.00	4.00	1.00	1.00

III. Functionality				
10. Options availability. Visible options to expedite the browsing process by providing instructions and options whenever possible.	3.00	3.00	1.33	1.33
11. Anticipation. Anticipates the user's needs by bringing up the tools that he may need.	3.00	3.00	1.00	1.00
12. Tailoring of frequent actions. Implementing documentation facilities to tailor frequent actions.	5.00	5.00	0.00	0.00
13. Tracing ability. Documentation of search process and task steps to enable users to trace their footprints.	2.00	2.00	1.00	1.00
14. Adaptation to user request type. Recognition of entries in different approaches, such as words, concepts, symbols, data, and etc to access purposeful search of information.	5.00	5.00	0.00	0.00
15. Display progress indicators. Instant feedback to user interaction and display processing information.	2.00	2.00	1.00	1.00
16. Backup memory. Prevent users from losing their work as a result of error.	3.00	3.00	1.00	1.00
IV. Structure				
17. Hierarchical organization of information. Logical and retrievable information hierarchies to accelerate searching speed. General information appears before specific details.	2.33	3.67	1.00	1.00
18. Indication of user location within the site. Layout designs and mapping tools provide users stable perceptual cues for the sense of location.	2.33	2.33	1.00	1.00
V. Assistance				
19. Misspelling recognition capability. Prompt alternatives for misspelled words.	5.00	5.00	1.00	1.00
20. Intelligent and customizable defaults. Provide meaningful defaults and facilitate easy customization.	3.00	3.00	0.00	0.00
21. Automatic response system. Availability of timely technical and technological assistance.	2.00	3.00	0.00	0.00
22. Procedural assistance. Concrete step guidelines focused on the user's tasks that are tight and responsive to problems.	2.33	4.67	0.00	0.00
23. Mistake solving support. Assistance for accidental mistakes by prompting "emergency exit" and supporting "undo" and "redo" functions.	5.00	5.00	0.00	0.00
24. Plain language for assistance. Use easy-to-understand language to help users recognize, diagnose, and recover from errors. Error messages should precisely indicate the problem and constructively suggest a solution.	5.00	5.00	1.00	1.00
25. Reporting website modifications. Make announcement/news about the change of the website.	5.00	5.00	1.00	1.00

* The scores represent the severity and extend of each item evaluated for the game. In severity, the higher the score, the less serious the problem. In extend, except scored zero, the higher the score, the worse the problem.

In the process, some items that might influence the learning are put in the earlier priority for modification, which include game appearance, symbols and language use, content organization, query responses, and procedure assistance. At the end of modification, we find that most questions in appearance and language have fewer problems, except few aesthetics designs and descriptive information that guide users through the game. On the other hand, the functionality and structures of the game have more problems, especially tracing ability, progress indicator, and location indicator. In the assistance aspect, intelligent defaults and automatic response system appear to be more serious than other items. These aspects and items are mostly related to the limited technical expertise of the design team. Among all, readability, visual presentation, terminology use, organization of information, and recognition to mistakes are rated highest, which means need less modifications.

Phase Two. Evaluation of the VSRPG

A. Student Assessment

Like problem-based learning and cooperative learning, situated learning instruction is the deliberate arrangements of events to facilitate learning (Driscoll, 1994; Heinich et al., 1999), which include three components: the desired outcomes, learning activities, and methods of evaluation. Unfortunately, although games are one of the most important human learning models that can intrigue learners' motivation, game learning is difficult to evaluate since learning effects are not its immediate results, and cognition transformation and motivations are intangible. Therefore, in this research we used a combination of descriptive quantitative and qualitative method to see how this digital learning material is taking place in the physical courses.

The result shows that the students' test score rise 12% after playing the game. Among the group, 87 students (64%) can totally understand the content, and only 2 students (1.4%) failed the test.

B. Focus Group

Focus groups are conducted to reach an understanding of students' learning process and reflections. The groups are led with only a few guided questions. After the session, the conference notes are analyzed to generate a conclusion.

In terms of cognition, the students think that they can practice the professional knowledge they previously learned in class, realize the content of lectures in real-life situations, and attempt to produce prescriptions in the virtual situation is a fresh and exciting experience. In the process, they are able to perceive more questions toward the content, and are more critical when facing the tasks. The digital game has provided a target for discussion, which they often talk about it between classes. It gives a context for students and teachers to confer about the characteristics of different herbs and identify the possible inter-relational effects in prescriptions. However, to low-achievement students, they tend to focus more on the fun, and ignore the herb prescriptions. In other words, since the game presented limited sorts of herbs, players can easily produce prescriptions in each stage with trial and errors until they find the solution.

In terms of skills, since paper and pencil case studies are common in classroom teachings and this game is a multimedia version of lively situations, after students diagnose the diseases the village people have from the symptoms they have in the game, almost all students confirmed that they can better apply their classroom knowledge into real life than before. The distributed thinking effect has demonstrated itself here, and has made the conventional textual learning more practical.

In terms of the emotional aspect, because the digital game is very different from the classroom lectures, the students like its interesting plots and challenges in the story. It helps to extend their learning motivation. However, since it is the first version of the game, there are places where a passageway to the exit is hard to find. This often eliminates their drive to continue.

From these focus groups, we understand that this game can lead to positive learning outcomes, but the production quality can often reduce its effectiveness. Moreover, since the game plot is in linear structure, there is only one difficulty level. For some, it is too easy, and for others, it can be too hard. If a game can offer multiple entry levels and points, the game can be more challenging. Another key weakness of the game is that there are so few herbs in each stage that the collection and prescription of herbs is effortless. For some, this allows them to capture the key item in a prescription; for others, the analytical challenge is insufficient.

To review the key elements of an effective learning game, there should be functions to support students' psychological development, allow them to immerge in the meaningful content, and induce their active participation into instructional tasks. Legend of Shannon has achieve its preliminary goal, and with more future development guidance toward perfection.

C. Game appraisals

At this stage, a questionnaire for game appraisals is distributed. It is a usability evaluation that aims to understand the influence of the game on the students' cognition, skills, and emotions.

Table 2

Game Appraisals

	Technical Aspect	Mean	S.D.
1.	The interface and icon arrangements are easy to understand and manage.	2.99	0.70
2.	Interface design is appealing and motivational.	3.17	0.67
3.	Functional control mechanism is user-friendly.	3.36	0.86
4.	User guide is accessible, searchable, and readable.	3.29	0.79
5.	Multimedia presentation is rich and appropriate.	3.21	0.72
	Instructional Aspect		
6.	Content is coherent to the learning objectives.	3.17	0.74
7.	Knowledge level is proper.	3.41	0.74
8.	Learning resources is rich.	3.31	0.84
9.	Software structure is clear, and fitting to learning.	3.24	0.61
10.	Situation is real and natural, and helpful to understanding.	3.29	0.63
	Motivational Aspect		
11.	Role-play increases learning participation level.	3.60	0.79
12.	Game plot is interesting, and stimulate motivation.	3.21	0.75
13.	Game stages are challenging, and raise sense of learning achievement.	3.22	0.74
14.	Gaming process can inspire analytical and critical thinking.	3.06	0.58
15.	Gaming process is interactive.	3.21	0.62

The questionnaires (see Table 2) include system functionalities, learning content, and learning models. 5 levels of Likert Scale of "totally agree," "agree," "average," "not agree," and "totally not agree" are used in the test. From the total 126 effective questionnaires, most of the evaluation items received positive feedback.

Looking at the technical aspect, the result shows that most users think the design of the game is appealing, and stimulated motivations. The control buttons are easy to use and quickly become a habit. The function guide is easy to understand and for search, and the multimedia presentation is appropriate. The test scores are between 3.1 and 3.4. Only the interface icon design is 2.9, a little lower than other functionalities. This means the interface design needs to be improved.

In terms of the instructional aspect, students think the game is coherent to the overall learning objectives; content level is appropriate, and resources are rich. The structure is clear and can match the learning progress. The situation is close to real life, and can raise the comprehension level. The average score is 3.28.

From the motivational aspect, we found users liked the plot and think it can stimulate learning motivations. The game is challenging, and helps them to have the sense of achievement. The game can strengthen the analysis and application ability, and is highly interactive. Additionally, the role-play modality increases learners' participation - the test score, 3.6, is higher than others.

D. Expert Interviews

From the expert interviews, we perceived the implicit problems hidden from statistics. Several suggestions are iterated for the future development of the materials.

First of all, most people think that a single-player game lacks the challenges of making collaborative efforts and fun. If the game could have multiple-players mode, it might be more interactive. At the same time, the game is designed in a linear one-story structure, and can be more challenging. Players should be able to choose the difficulty levels, including the dynamic of rewards and punishments to have a higher degree of complexity. Then, the game can appeal to and be effective for users in a wider ability range.

The current character in the story a player can role-play with is Shannon. If in the future the game can provide more characters for the players to choose from, it can be more appealing and fun. Other than that, the game can strengthen its "empowerment" dynamic. If the user plays the game with more frequency, the system can increase the character's power in some way so that the players would be willing to get into the system more, helping to increase the motivation.

These suggestions are mostly laid on one important element, the multiplicity. A good game needs multiple roles, modes and levels for the users to choose and interact from. It can create an environment that is even close to real life, enhancing the cooperative learning mechanism, and suffice to more diverse users. Because this digital game is only at the prototype stage, it neither has the needed nor the possible complexity yet. However, in the future development, it is necessary for the design team to work toward a more complete implementation. The second version of the game will be designed as Inheritance War of Shannon's Posterities. The intent is for the content to match up the learning objectives and instructional design ideals better than in the prototype.

Discussion

Different from other digital games, Legend of Shannon is based on professional knowledge of Chinese herbal medication. Other than parts of the plots in the game being purely fictional, that is created from folklores and imaginations, including the legend of Shannon, the geographical portrait, and many tales and monsters, all other information, especially the herbs and medication facts, are real to provide accurate, correct professional education. In order to give it high creditability, the content of the game is evaluated by the experts in the Chinese Herbal Medication Safety Information Committee led by the Department of Health, Executive Yuan in Taiwan.

The main contribution of this research is that the development of an innovative VSRPG digital learning model demonstrated the implementation of activity-based learning with meaningful learning resources and the use of role-play mechanism in accelerating students' learning motivation. The digital game presents the construction of a student-centered learning environment that supplements the classroom teaching to reinforce students' learning experience. We learned that the design of games for learning needs to eliminate visual distraction, without losing their fun

and challenges. There should be sufficient knowledge content to include course-related materials, and opportunities for students to synthesize and apply learned-knowledge in the tasks.

In cooperation with the establishment of Chinese Herbal Medication Safety Information Center by the Department of Health, Executive Yuan in Taiwan, this research with the experiment of design and implementation of the game, Legend of Shannon, explored the opportunities to use digital technology to create virtual situations for students to learn professional knowledge in constructive ways. With this VSRPG, we tested an interactive multimedia learning environment for the education of medicine, and aimed to promote the knowledge to the general public. It opens up a channel for the government to market the college digital content to the wider Chinese market either in Taiwan or internationally. The design and implementation process of this research hopes to provide experiences to academics with their similar attempts.

Acknowledgement

This research was supported by National Science Committee in Taiwan under the category of National Technology Plan for Digital Learning, and as a part of the result of the project "Shannon Sutra: Digital Learning Content and Experimental Research on Chinese Herbal Medication Safety" (NSC-93-2524-S-127-001). Special thanks are owed to the research team in Digital Content and e-Learning Laboratory in Tajen University, Taiwan.

References

Artemeva, N., Logie S. & St. Martin, J. (1999). From page to stage: How theories of Genre and situated learning help introduce engineering students to discipline-specific communication. *Technical Communication Quarterly, 8*(3), 301-316.

Ausubel, D. P., Novak, J. D., Hanesian, H. (1978). *Educational Psychology: A Cognitive View* (2nd Ed.). New York: Holt, Rinehart and Winston. Reprinted, New York: Werbel & Peck, 1986.

Avezedo, R., & Bernard, R. M. (1995). A meta-analysis of the effects of feedbacking computer-based instruction. *Journal of Educational Computing Research, 13*(2), 111–127.

Baltra, A. (1990). Language learning through computer adventure games. *Simulation and Gaming, 21*(4), 445–452.

Brandt, B. L. (1996). Cognitive learning theory and continuing health professions education. *Journal of Continuing Education in the Health Professions, 16*(4), 197-202

Brown, J., Collins, A., & Duguid, P. (1989). Situated Cognition and the Culture of Learning. *Educational Researcher, 18*(1), 32-42.

Chian, C, -F., Sung, W, -S., Yang, Y., -K., & Yei, S, -L. (2004). *Development of E-learning-based Rehabilitation System for Mental Disorders.* Taiwan: National Science Committee, NSC93-2213-E214-031.

Csikszentmihaliy, M. (1990). *Flow: the psychology of optimal experience.* New York: Harper & Press.

Dick, W. & Cary, L. (2005). *The Systematic Design of Instruction,* (6rd Ed.). Boston: Allyn & Bacon.

Driscoll, M. (1994). *Psychology of learning for Instruction.* Boston: Allyn & Bacon.

Elliot, J. Adams, L., & Bruckman, A. (2002). No Magic bullet: 3D video games in education. In *Proceedings of International Conference of the Learning Sciences.* Seatle, WA: Oct. 23-26.

Fister, S. (1999). CBT fun and games. *Training, 36*(5), 68-78.

Fletcher, P. & Collins, M. (1986/87). Computer-administered versus written tests‹advantages and disadvantages. *Journal of Computers in Mathematics and Science Teaching, 6*(2), 38-43.

Friedl, M. (2003). *Online Game Interactivity Theory.* MA: Charles River Media, Inc.

Hackos, J. T., & Redish, J. C. (1998). *User and Task Analysis for Interface Design.* New York: John Wiley & Sons, Inc.

Heinich, R., Molenda, M., Russel, J, and Smaldino, S. (1999). *Instructional media and Techologies for Learning*. (6th ed.). Columbus, OH: Prentice Hall.

Hobebein, P. C. (1996). Seven Goals for the Design of Constructivist Learning Environments. In B. Wilson (Ed.), *Constructivist Learning Environments: Case Studies in Instructional Design.* NJ: Educational Technology Publications, Inc.

Hsu, C, -Y., Wang, C, -C., Chien, W, -S. (2004). *Building an E-Learning Model for Preventing Abuse of Club Drugs.* Taiwan: Department of Health, Executive Yuan, DOH93-NNB-1018.

Hubbard, P. (1991). Evaluating computer games for language learning. *Simulation and Gaming, 22*(2), 220–223.

Hung, R, -C., & Liu, M, -C. (1992). *The Design Principles and Applications of Computer-Assisted Instruction.* Taipei: Shtabook.

Kafai, Y. (1995). *Minds in play: Computer game design as a context for children's learning.* Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Kim, K. H., Park, J. Y., Kim, D. Y., Moon, H. I,, & Chun, H. C. (2002). E-lifestyle and motives to use online games. *Irish Marketing Review, 15*(2), 71-77.

Knowles, M. (1996) Adult learning. In R. L. Craig (Ed.) *The ASTD training and development handbook* (4th ed.). NY: McGraw-Hill.

Lave, J., & Wenger, E. (1991). *Situated learning and legitimate peripheral participation. Cambridge.* UK: Cambridge University Press.

Lepper, M. R., & Malone, T. W. (1987). Intrinsic motivation and instructional effectiveness in computer-based education. In R. E. Snow, & M. J. Farr (Eds.), *Aptitudes, learning and instruction, III: Cognitive, and Affective Process Analysis.* (pp. 255-286). Hillsdale, NJ: Lawrence Earlbaum Association.

Levi, M. D., & Conrad, F. G. (2002). A Heuristic Evaluation of a World Wide Web Prototype. Washington, DC: Bureau of Labor Statistics. Retrieved July 1, 2004, from http://stats.bls.gov/ore/htm_papers/st960160.htm

Malone, F. (1980). Toward a theory of intrinsically motivation instruction. *Cognitive Science, 5*(4), 333–369.

McFarlane, A., Sparrowhawk, A. & Heald, Y. (2002). Report on the educational use of games: An exploration by TEEM of the contribution which games can make to the education process. (On line). Available: http://reservoir.cent.uji.es/canals/octeto/es/440.

Mulligan, J., & Patrovsky, B. (2003). *Developing Online Games: An Insider's Guide.* Indiana: New Riders Publishing.

Nielsen, J. (1994). *Heuristic Evaluation.* Retrieved January 8, 2002, from http://www.useit.com/papers/heuristic

Papert, S. (1980). *Mindstorms: children, computers, and powerful ideas.* New York: Basic Books.

Pea, R. D. (1987). Socializing the knowledge transfer problem. *International Journal of Educational Research, 11,* 639-663.

Perrone, C., Clark, D., & Repenning, A. (1996). WebQuest: Substantiating education in edutainment through interactive learning games. *Computer Networks and ISDN Systems, 28*(7-11), 1307-1319.

Piaget, J. (1951). *Play, Dreams and Imitation in Childhood.* New York: Basic Books.

Provenzo, E. (1991). *Video kids.* Cambridge: Harvard University Press.

Rogoff, B. (1990). *Apprenticeship in Thinking: Cognitive Development in Social Context.* New York: Oxford University Press.

Rosas, R., Nussbaum, M., Cumsille, P., Marianov. V., Correa, M., Flores, P., et al. (2003). Beyond Nintendo: design and assessment of educational video games for first and second grade students. *Computers & Education, 40*(1), 71-94.

Schank, R. C. (1990). *Tell Me a Story: A New Look at Real and Artificial Memory.* New York: Scribner.

Schwen, T. M., Kalman, H. K., Hara, N., & Kisling, E. L. (1998). Potential knowledge management contributions to human performance technology research and practice. *Educational Technology Research and development, 46*(4), 73-89.

Senge, P. M., & Fulmer, R. M. (1993). Simulations, Systems Thinking and Anticipatory Learning. *Journal of Management Development, 12*(6), 21-33.

Sivin-Kachala, J., & Bialo, E. R. (1994). *Report on the effectiveness of technology in schools 1990–1994.* Washington, D.C.: Software Publishers Association.

Stanford University, Information and Technology Systems and Services (2001). *Heuristic Evaluation.* Retrieved July 1, 2004, from the Stanford University, Information and Technology Systems and Services Web site: http://www.stanford.edu/group/web-creators/heuristics.htm

Turkle, S. (1984). *The Second Self: Computers and the Human Spirit.* New York: Simon & Schuster, Inc.

Vygotsky, L. (1976). Play and its role in the mental development of the child. In Bruner, J., Jolly, A., & Sylva, K. (Eds.) *Play- Its Role in Development and Evolution,* (pp. 537-554). New York: Basic Books.

Wolfson, L., & Willinsky, J. (1998). Situated Learning in High School information technology management. *Journal of Research on Computing in Education, 31*(1), 96-110.

About the Authors

Ju-Ling Shih is Associate Professor, Dept. of Educational Technology at Tamkang University.

Bai-Jiun Shih is Associate Professor, Dept. of MIS at Tajen University.

Rey-Long Chen is Professor and President of Tajen University.

Correspondence:
Ju-Ling Shih
Department of Educational Technology, Tamkang University
151,Yin-Chuan Road, Tamsui, Taipei Hsien 251, Taiwan, R.O.C.

Office: 886-2-26215656 ext. 3528 Fax: 886-2-86315377 E-Mail: juling@mail.tku.edu.tw

Editor's Note: This paper addresses the reasons for building online education programs for Human Resource Development professionals, and confronts transition and implementation issues. Resolution of some concerns expressed is a *work in progress*.

Challenges and Solutions in Offering Distance Education programs:
A case study of an HRD program

Bassou El Mansour

United States

Abstract

Distance education has created a growing opportunity to provide education that will impact the field of Human Resource Development (HRD) and create new knowledge and skills that better serve today's practitioners. This trend makes it essential that those involved in preparing future professionals, in this case HRD professionals, examine closely how to take advantage of the many opportunities that distance education has to offer. Depending on the format, distance education can often create challenges that may impact the quality of the whole system. In the case of an HRD program offered via distance education, there are at least three major groups of stakeholders – the administration, faculty, and students. This paper explores some challenges and solutions faced by the distance education HRD program at Indiana State University (USA). Challenges such as workload, space allocation, student persistence, student honesty, faculty development, copyright, and intellectual property are examined.

Keywords: distance education, Human Resource Development, workload, infrastructure, learning styles, teaching styles, student persistence, faculty development, copyright, intellectual property.

Introduction

As the Internet becomes a major factor in education, higher education in the U.S. is increasingly turning to distance education technologies to deliver the curriculum at all levels. On reason for the popularity of distance- based courses is the freedom to choose the time and place to study. Students, and especially adult learners, are struggling to balance their educational needs with a job, family, health issues, and financial worries. Internet classes allow them to learn at a pace that is comfortable to them, at a place of their choosing, and at a time when there are least interruptions. The main reasons given by adult learners in a research study were: to gain skills that will help them get further in their careers, to enrich their lives with more knowledge, to complete a degree or other credential, and to fulfill the requirements of their employers to take educational courses (Berker, 2003).

Today distance education has become an alternative method for delivering academic course work to students. Ryan et al (1999) wrote "The current paradigm shift in higher education is from traditional classroom settings to distance education program delivery via the World Wide Web (WWW)" p.272. Furthermore, distance education eliminates the barriers of time and distance by offering instructional material instantaneously and continuously (Piskurich, 2003 & Bullen, 2003). Distance education allows the learning process to become continuous and accessible any time. It illustrates the advantage of unlimited access and retrieval of electronic learning materials. As Merriman (2006) wrote "Online education is entering the mainstream, according to some higher education analysts, and its growing popularity with employers is part of the reason" p.79.

This trend makes it essential that those involved in preparing future professionals, in this case HRD professionals; to examine how to best use online learning to ensure quality learning.

Background

Distance education has created a growing opportunity to provide education that will impact the field of Human Resource Development (HRD) and create new knowledge and skills that better serve today's practitioners. The purpose of the HRD program offered at Indiana State University is to prepare HRD and Training professionals for higher education, industry, business, government, and other agencies. The goal is to develop graduates who are competent in planning, conducting, and managing education, training, and other human resource development activities. In addition to the required coursework, students in these programs are required to complete an internship.

The department that offers the HRD program was chosen based on the fact that it has over ten years of experience delivering the curriculum at all levels via distance education technology as well as through more traditional delivery systems. Currently, there are over 300 students completing degrees at a distance. The HRD major is offered at the undergraduate level leading to a Bachelor of Science degree and to a Master of Science at the graduate level. Since 1994, the BA/BS program has grown in enrollments (i.e., unduplicated headcount) from 29 to approximately 145 in 2006. During the same period, the MS program has increased from 87 students to approximately 150. The faculty in this program also offers a Ph.D. program, which at present has 50 students enrolled in the HRD specialization. Currently, there are four full-time, tenured and three tenure-track faculty lines dedicated to this program. The dean teaches courses in these programs.

The program under consideration began offering distance education via correspondence courses more than 20 years ago. Ten years ago, the department made the choice to expand the offerings and employ the satellite television network in the State of Indiana to reach more students. In the past five years, the majority of the students have migrated to the Internet sections of the courses. Since that time, the numbers have been increasing.

The courses for both programs are offered using three modalities: face-to-face, video/television network, and the Internet. The course content is delivered face to face in a lab classroom to students registered as on campus- students as well as to students who use video/television network via satellite technologies from other Indiana sites. The course material is then posted on Blackboard, an online course management platform for all the students to use.

The HRD program represents the initial attempt in exploring new means to improve teaching through the effective and convenient utilization of educational technologies. Second, the purpose of the department is to leverage distance education as a means to reach working adults, improve learning, and enhance learner's capabilities. Technology offers the department one other means to achieve a long term vision of not only attracting new traditional students, but also professionals currently working in the field of human resources as well as working adults seeking continuous education (The majority of the students in the HRD program are working adults with 25 percent of them working in the field of human resources). Finally, an important factor was the department's need for distance education methodologies that are transforming higher education to meet the demands of the changes developing due to the advent of the internet.

Challenges and solutions

Whenever we consider the challenges relative to a specific program or course of instruction, it is necessary to note that there are multiple stakeholders. In the case of an HRD program offered via distance education, there are at least three major groups of stakeholders. They are the administration, the faculty, and the students. The challenges, taken in no particular order, are discussed in the following,

Infrastructure and Space Allocations

Developing and maintaining the necessary infrastructure to support distance education constitutes the first challenge. This involves such things as developing or purchasing the necessary computer bandwidth, instruction development hardware and software, faculty support (IT personnel and instructional designers), as well as providing multiple opportunities for training. This is not simple, nor is it inexpensive. Indiana State University was successful in attracting a significant amount of state support and external funding to develop the necessary infrastructure for Internet delivery. To support the program in question, the university invested in excess of $400,000 over a two year period of time to create a television and Internet ready classroom that is in essence a full-feature studio that seats 24 students.

In short, the transition of instruction from face-to-face to distance delivery can be quite expensive, requiring major investments in hardware and software. However, there is often another interesting outcome of this transition; the actual need for space declines as fewer and fewer students choose not to attend on-campus courses. In some cases, this has the net effect of programs losing physical space even with significant growth in enrollments.

Faculty Development

Research suggests that faculty as a whole see Internet delivery of classes as a good thing; they also admit that many, if not most, lack the skills necessary to incorporate it in an effective way. Many teachers have had no prior experience with this method of teaching and the only solution offered to them in most cases was in-service training (Wonacott, 2001). Among the influences to faculty's resistance to teach distance education courses are: a perceived lack of institutional support and training as well as lack of technical training (Clark, 1993).

Indiana State University through the Center for Instruction, research and technology (CIRT) offers a multidimensional professional development program for faculty and staff to increase their competence and confidence in the areas of teaching distance education courses. Distance teaching instructors participate in faculty development courses, seminars, workshops, and summer institutes for which they receive a stipend. CIRT offers programs for faculty and staff in many other formats such as one-on-one training, self-study tutorials and computer-based, and resources and services. Instructional designers assist faculty with course development and implementation.

Distance education department publishes a free e-newsletter that contains important University announcements to help students start and complete their distance courses. Technical support is also provided to students. A toll free number allows students to call 24 hours for technical support. Quality of instruction is also ensured by peer course review as well as evaluation by instructional designers regarding the design and management of the course.

Faculty Workload

Depending on the format, distance education can often create an overwhelming workload for faculty. K. Holt (2005) in a study that compared faculty time requirements in online and traditional course formats found that faculty time requirements to deliver an online course took significantly more time when compared to a traditional course regardless of employment status, academic rank, course discipline and faculty gender. Several authors also agreed that web-based courses require more time and effort on the part of faculty in comparison with classroom courses of comparable size, content, and credit (Tomei, 2005; Visser, 2000; Rockwell, Schauer, Fritz & Marx, 1999).

Traditional methods of face-to-face instruction allow faculty to maximize their delivery capability. Synchronous forms of distance education (e.g., television networks) also allow one teacher to impact many students simultaneously. As faculty become more involved with asynchronous methods the workload tends to increase as the major of the teaching and advising

interactions are completed individually. So instead of one teacher teaching a lesson to 45 students simultaneously, that same teacher may have hundreds of interactions with the same 45 students to deliver the same amount of instruction and advisement.

Regarding the online teaching, the workload increases with the increase of the number of students. According to Dibiase et al (2005) an increase from 18 students in a class to 49 students increased course-related workloads from 47.5 hours to 116.7 hours total. Consequently, today a normal load for the HRD faculty at Indiana State University is to teach three sections of two courses. Often these courses have both the undergraduate and graduate sections. In that case, the professor would actually have three sections of four courses. Given that this program has grown quite large due to the number of faculty and given that most of their students are in the Internet sections, this workload has become quite overwhelming. Faculty is currently exploring ways to reduce this workload by reducing the number of sections, and employing group means such as a frequently asked questions page on their web pages, chat sessions, and other interactive communication tools

Another aspect of workload has to do with course preparation. Unlike traditional face-to-face classes, distance education classes (especially asynchronous ones) must be prepared fully in advance.

The final aspect of workload has to do with advising. Without a doubt, quality developmental advising is essential if students are to maximize their educational experience. Consequently, faculty is often encouraged to do much more than simply sign off on an advisee's registration sheet. Assistance with academic, financial, career and personal concerns has made quality advising very demanding and time consuming for the faculty. With over 300 majors and seven faculty members, this constitutes a significant portion of the faculty's workload. In addition, advising distance students from all over the country via e-mail and the Internet is particularly challenging. Faculty is debating the creation of an administrative unit that will help students with registration questions and scheduling while faculty advises on academic, career, and personal matters. To address the issue, some institutions go so far as to employ full-time advisors and remove that workload from faculty.

Student Persistence and Learning Styles

As many universities struggle to maintain a 40% six-year graduation rate, lack of persistence has been a concern for the faculty who reported that they often found that some students, especially traditional undergraduates were not prepared to take more responsibility for their own education. Very little in their educational experiences to date prepared them to deal with the autonomy and responsibility of asynchronous instruction. Graduate students seemed to be more capable of generating self-discipline to complete assignments in a timely fashion and to treat the assignments seriously.

Student persistence is a major issue also for Indiana State University as the state is considering basing their funding on the university graduate rate. Low persistence rate will have serious implications on the program. A decrease in the number of students means a drop in tuition income. This, in turn, impacts the department's ability to maintain the quality of its instructional offerings. To address the issues associated with persistence rate, the faculty attempts to anticipate where students might have difficulty and ensure, as much as possible, that the students will be able to master the material on their own. Otherwise the faculty member can expect a small flood of e-mail messages.

Research has put a lot of importance on learning styles for internet students. Authors feel that if the instructor knows the learning styles of his/her students, he/she can build a better course content. If instructors have an understanding how students learn and are able to address each different learning style and incorporate it into their courses, greater learning will take place, the

learners will be able to interact better, and get more our of the class (Barnes, Gooden, & Preziosi, 2004). “Some adults are inclined toward teacher-centered instruction, and some may opt for self-oriented or self-directed instruction. Some may prefer reading to gather new information, and others may desire a multimedia presentation for acquiring the same information. These learning styles complicate the distance educator’s job but must be considered during early planning activities” (Clark & Verduin, 1991).

In addition, Clark (1993) observed that faculty using distance education technology face a variety of challenges when adapting their teaching styles to a mode compatible with distance education environment. Faculty in the HRD program, in this regard, is using techniques such as online networking where students are placed in groups called communities. Such groups allow students to actively participate, share ideas, and help each other overcome the barriers of distance learning. Instructors assume the responsibility of making sure that students are participating in the class. To maintain these groups, instructors are very accessible, they provide progress updates on regular basis, and they encourage students to respond to each other’s questions and comments.

Academic Honesty

Academic honesty is another challenge in distance education. Not only is there a wealth of information on the Internet, ready to be copied and pasted, and often presented as the learner’s own work, but there are numerous websites the offer research papers for sale. This can be a great temptation for student’s who feel they are not doing well enough, who want to spend their time on other things, or who simply don’t have the skills to do the work themselves and receive a passing grade. This places a different role on the instructor; that of detective or “honesty police” (Holt, 98). While there evidence that age is associated with lower levels of cheating (Whitley, 1998), Faculty, while recognizing the importance of plagiarism detection, is more interested in prevention. In an effort to communicate faculty expectations about the proper use of reference materials published online, the HRD faculty uses expectation management to enforce academic integrity standards. Each faculty member develops a section in the syllabus that explains academic dishonesty as well as encourages students to read and ask questions about the University Student Handbook. Faculty also uses Turnitin.com to detect plagiarism.

Another challenge to academic honesty, relates to the identity of the test taker. Instructors have no way of knowing who is actually taking the test (Kerka & Wonacott, 2000). For example, instead of giving a test online, the instructor could require the student to go to an approved site and have the test proctored. Currently, this method is only used with PhD students taking their preliminary exams. As time goes on, there may be other solutions we have not considered thus far. Technology is ever advancing and could come up with a way to assure academic integrity.

Intellectual Property

Of significant concern for both faculty and administration is the issue of ownership and use of the instruction developed for distance delivery. The issue of intellectual property on university campuses in the United States is a hotly debated and rarely settled issue. Some institutions insist they own it all and may or may not share the “profits” with faculty. Others take a more “generous” position. Faculty on the other hand, tends to desire to retain ownership rights. For the Indiana State University, this issue reached crisis state when a senior faculty demanded that all university records of his courses be destroyed just as he was retiring. The department chair complained to University Council but was overruled. Council ruled that the institution had not taken the necessary steps to retain at least shared ownership. Today, faculty is required to sign a waiver for each course they are paid to develop. The waiver states that both the faculty and the university own the materials and have the right to use them in the future.

Copyright

One small but significant challenge is the use of copyrighted material for Internet based courses. Although huge amounts of data are available on the Internet, not all of it can be used freely. The instructor may also have materials that are available for nonprofit educational institutions but can not be posted to the Internet by the instructor. This would require the instructors to look elsewhere for pertinent materials for the class (Wonacott, 2001). Copyright laws were amended in 2003 to include these issues. The Technology Education and Copyright Harmonization (TEACH) legislation enacted comprehensive changes that educators must follow where distance education is concerned (Lipinski, 2005).

Implications

This analysis highlighted information on challenges that administrators and distance education faculty need to reexamine. It also brought relevant information to education professionals working in developing countries around the world. Lastly, the inconclusive solutions presented in the paper create a need for similar analysis to document other studies and practices.

Summary

As can be seen from the analysis above, many issues challenge the success of distance instruction, especially whole programs offered via asynchronous means. In a day, when it seems that everyone is trying to do more with less, it does not appear to be possible to do so in this case.

References

Barnes, B., Gooden, D., & Preziosi, R. (2004). An examination of the learning styles of online MBA students and their preferred course delivery methods. *New Horizons in Adult Education*, Vol. 18, No 2. Retrieved July 6, 2006, from http://www.huizenga.nova.edu/about/ResearchReports/HS07-11-04LearningStylesofOnlineMBAStudents.pdf

Berker, A. (2003). Work first, study second [microform]: Adult undergraduates who combine employment and postsecondary enrollment. *U.S. Dept. of Education, Institute of Education Sciences, National Center for Education Statistics.* Washington, D.C. Retrieved July 9, 2006, from http://purl.access.gpo.gov/GPO/LPS50350

Bullen, M. (2003) E-learning emergence. *CGA Magazine*. Toronto: Jul/Aug. (37) 4.

Clark, T. (1993). Attitudes of higher education faculty toward distance education: A national survey. *The American Journal of Distance Education,* 7 (2), 19-33

Clark, T. & Verduin, J. (1991). *Distance education: The foundations of effective practice*. San Francisco, CA: Jossey-Bass Publishers.

Dibiase, D & Rademacher, H .J. (2005).Faculty Workload, Class Size, and Student Satisfaction in a Distance Learning Course on.*Journal of Geography in Higher Education.* Oxford: Mar 2005(29) 1, p13.

Holt, K. (2005). A comparison of faculty time requirements in online and traditional course formats: Health science and non-health science courses. Touro University International

Merriman, K. (2006) Employere warm up to online education. *HR Magazine*, January 2006.

Holt, M. (1998). Ethical considerations in Internet-based adult education. *New Directions* for Adult & Continuing Education, Summer 1998, Issue 78, p 63. Retrieved August 6, 2006, from Academic Search Elite Database. AN 845887.

Jocoy.C. & DiBiase. D. (2006). Plagiarism by Adult Learners Online: A case study in detection and remediation. The International Review of Research in Open and Distance Learning, 7 (1), June 2006, No 1 .

Kerka. S. & Wonacott, M. (2000). Assessing Learners Online. Practitioner File. *ERIC clearinghouse on Adult, Career, and Vocational Education.* Columbus, OH. Retrieved August 7, 2006, from Indiana University Library [microfiche]. Full text available at http://www.ericacve.org/fulltext.asp.

Lipinski, T. (2005). *Copyright law and the distance education classroom.* Lanham, MD: The Scarecrow Press, Inc.

Merriman. K. (2006) Employers warm up to online education. HR Magazine, January.

Piskurich, G. M. (2003).Preparing learners for e-learning. San Fransico: Jossey-Bass/Pfeiffer, p.73.

Rockwel, S.K., Schauer, J., Fritz, S.M., & Marx, D.B. (1999). Incentives and obstacles influencing higher education faculty and administrators to teach via distance. *Online Journal of Distance Learning Administration,* II **(111),** Winter1999 State University of West Georgia, Distance Education Center, Retrieved July 12, 2006 from *http://ww1v.westga.edu/_distance/rockwell24.html*

Ryan, M.; Carlton, H; K. & Ali, N. S. (1999). Evaluation of traditional classroom teaching methods versus course delivery via the world wide web. *Journal of Nursing Education,* 38, p272.

Tomei, L. A. (2005). The impact of online teaching on faculty load: Computing the ideal class size for online courses. *Journal of Technology and Teacher Education*.

Wonacott, M. (2001). Implications of distance education for CTE [microform]. ERIC Clearinghouse on Adult, Career, and Vocational Education, Center on Education and Training of Employment, College of Education, the Ohio State University. Retrieved August 6, 2006, from http://purl.access.gpo.gov/GPO/LPS26084.

Visser, J .A. (2000). Faculty work in developing and teaching web-based distance courses: A case study of time and effort. *The American Journal of Distance Education,* 14(3),21-32.

Whitley, B. (1998). Factors Associated with Cheating Among College Students: A review. Research in Higher Education, 39(3), 235 – 274.

Wonacott, M. (2001). Implications of distance education for CTE [microform]. *ERIC Clearinghouse on Adult, Career, and Vocational Education, Center on Education and Training of Employment, College of Education, the Ohio State University.* Retrieved August 6, 2006, from http://purl.access.gpo.gov/GPO/LPS26084.

Lipinski, T. (2005). *Copyright law and the distance education classroom.* Lanham, MD: The Scarecrow Press, Inc.

About the Author

Bassou El Mansour, Ph.D. is Assistant Professor of HRD and Assistant Director of the Technology Services Center in the Industrial Technology Education Department at Indiana State University, Terre Haute, Indiana USA

Ph: (812) 237-3455 E-mail: belmansour@isugw.indstate.edu

Editor's Note: This study provides useful data comparing two dissimilar institutions with comparable goals. It confirms the importance of distance learning for university outreach, and shows differences resulting from technology and methodology.

A Pilot Study Comparing MA Education through Distance Education in a Developed Country (USA) and a Less Developed Country (Pakistan)

Tanvir Malik

Pakistan

Introduction

The Pilot study is a comparative study of MA (Education) through distance education in a developed nation (USA) and a less developed nation (Pakistan). Two institutions were selected to conduct this research. Grand Canyon University (GCU) Arizona was selected because it was established in 1949 and has a master program in education. A distance education student can get admission into the masters program and complete a degree through distance education. Allama Iqbal Open University (AIOU) was selected for the study because it also had a masters program in education; where a distance education student could finish his or her degree without physical presence on the campus. AIOU is a state run institution modeled after British Open University. The purpose of the study was to see if there were differences and similarities existing between distance education systems of both the countries. Data from the study would enable planners of GCU and AIOU to measure and compare results for future planning and development.

Hypothesis

Seven hypotheses were formulated for testing through data collection and statistical analysis. For distance education students in the specified institutions in both countries:

Ho1 There is no significant difference in age.

Ho2 Marriage, children, and jobs do not affect performance.

Ho3 Residency does not affect performance.

Ho4 Use of modern technology has a significant affect on performance.

Ho5 Flexibility of time and space has a significant effect on the performance.

Ho6 Student satisfaction has a significant effect on performance.

Ho7 Teaching methodologies have a significant effect on the performance.

Procedure

In order to test these seven hypotheses a 77-item questionnaire was constructed. This student questionnaire consisted of several parts according to the different aspects of distance education included in this study. First part of the questionnaire for students had the demographic questions. Most of the demographic questions had yes/no responses. For the remainder of the questionnaire a 5 choice Likert type scale was used with possible responses of strongly agree, agree, neutral, disagree, and strongly disagree. Each response category was assigned a numeric value. A greatest negative response (strongly disagree) was scored as "1" and a highest positive response (strongly agree) was scored as "5".

The questionnaire was constructed in two languages: English for the USA students and Urdu, the National language of the Pakistan, for students in Pakistan. The questionnaire included items on admission, student support services and teaching methodology. A second questionnaire was constructed for experts and faculty of the both countries. This questionnaire had open-ended questions to assist in interpreting the data and validate the responses of students.

Population and Sample size

Population for this study was all students who had completed at least one course from their institution at the time of the study. Simple random sampling ensured equal participation of the population. For this study there was no distinction between degree and non-degree students as AIOU did not offer non degree courses.

Distribution of questionnaires

450 questionnaires were sent out in the months of April and May of the by the GCU Arizona and AIOU Islamabad. Completed questionnaires were received in June and Julyt. No questionnaires were accepted after September 15. Incomplete questionnaires were not included in the study.

A master sheet was formulated to compile data where each response was given a numeric value. Frequency of occurrence and percentage were applied on demographic data; t-test was applied where relevant.

The researcher personally administered the questionnaires for faculty and experts who had practical experience in the field of distance education. Eleven questionnaires for the faculty and experts were sent and only four responses were returned and two respondents were interviewed to gain additional information.

Results and discussions:

The present study deals with a comparison of MA Education through distance education using similar distance education programs in a developed country (USA) with a less developed country (Pakistan).Different factors of distance education were studied and analyzed statistically.

- The study indicated that the majority of the students were married females. Most were employed and had completed some courses as distance education. Large numbers of students in both countries chose distance education because of flexibility of time and space. This study also indicated a majority of respondents were satisfied with distance education. The majority of respondents did not live in the city where the main campuses were located. Because of their “non-resident” status, both samples consisted of non-traditional students.
- T-test for independent samples was applied to find out the significance of the difference of mean. The study found that distance education in the USA had greater involvement with technology and that faculty, experts and students were very comfortable with the technology. On the other hand, , Pakistani respondents reported minimal use of technology and reliance on handwritten assignments and traditional tests. AIOU Islamabad students had an opportunity for students to meet with their tutors in a ten-day workshop. At the end of the workshop, there was a three-hour long examination with long essay-type questions.
- Grand Canyon University provided an orientation tape and orientation. No admission test of any sort was offered at GCU.
  Allama Iqbal Open University required a pre-test to get admission to the AIOU teaching programme.

- Grand Canyon University students can fill out and submit their application online.
  In Pakistan, mail was the only medium to receive / submit the application for admission.
- USA students could use electronic media to receive or submit their study material.
  Pakistani students relied on postal service to receive or submit their study material.
- USA students receive a printed text and videotapes, CDs or DVDs.
  Pakistani students receive a printed study guide and Xeroxed materials.
- USA students communicate with faculty and the institution via telephone, Email, Fax, toll free numbers and voice messaging.
  Pakistani students rely upon postal service or telephone to contact faculty and institution.

This study showed a striking difference in methodologies of teaching and training.

- A distance education student in the USA (GCU) has internet, video segment and colleagues for review and assessment. At the end of the term he/she must submit a reflective paper to show how much learning took place.
- A distance education student of Pakistan (AIOU) has an assignment sheet with 5 questions. Each question requires a 3000 word hand-written response to be submitted to the tutor within a one month. Students who solve three assignment sheets can join a workshop at the main campus for 10 days with a traditional classroom experience. Successful completion requires a final exam in the form of long essay type questions.

Note: A distance education student of Pakistan does more work when compared to a distance education student of the USA. This does not mean that in Pakistan a distance education student has more opportunity to learn; since methodology and technology support are different.

- Respondents of both universities had libraries where they could do research. The difference was in the use of technologies; such as: computers, internet, databases, telephone, fax and photocopier. CGU students (USA) have more exposure and access to technologies when compared to AIOU students in Pakistan.

Apart from questionnaires, personal informal visits were conducted with Dr. Ron Graham and Dr. Mohammed Rashid. Both gentlemen were the directors of their institutions with direct experience in their distance education programs. Both scholars held the view that budget, affordability, and cost might result in differences in the distance education systems of both nations. In the USA, distance education has access to and can afford more technology.

Review of hypotheses:

The first hypothesis proved to be true as both universities had similar age groups enrolled in their distance education master programs.

The majority of the respondents from both universities indicated that children and jobs did not do not effect their performance in distance education.

The third hypothesis proved to be true. Residence did not affect student's performance. The majority of students in both universities did not live close to main campuses. Compared to resident students, they showed similar performance and completed the same number of courses.

The fourth hypothesis, that use of modern technology had a significant effect on performance was proved to be true. USA students earned better grades and were more satisfied with distance education. They had fewer difficulties in getting materials and communicating with their

university. Almost every student had direct or indirect access to the Internet and e-mail. The majority had access to a fax machine and other useful technology. Pakistani students did not have direct access to computers, Internet, fax machines, or e-mail. Some of these students even asked what e-mail was because they didn't know.

The fifth hypothesis was proved to be true. The majority from both universities chose distance education because of flexibility of time and space.

The sixth hypothesis relating satisfaction to performance proved to be true. Students from both universities earned more course credits and were most likely to complete their programs than those who were not satisfied with distance learning programs.

The seventh hypothesis dealt with methods of teaching and their effect on performance. Data clearly indicates that students with better technology earn better grades and were more satisfied with the program. Respondents from the USA sample agreed that they were benefiting from use of technology. They had access to computers, e-mail, fax machines, voice messaging, databases like ERIC, internet, and VCRs; while respondents of the Pakistani sample were relying on print media, handwritten assignments, mail, and workshops (10 day formal classroom experience), essay type exams. Overall had very little exposure to technology.

Experts and faculty confirmed USA faculty members had e-mail addresses and were relying on technology a lot more than in Pakistan. USA faculty members were found to be comfortable with the use of technology and wanted to continue use of technology. Some had sufficient technical skills to solve computer problems. In Pakistan very few faculty members had e-mail addresses or web sites. Their contact with students was mail and they did not usually have access to fax machines, voicemail, or computers in their offices. Faculty members of AIOU were aware of the importance of technology and that it would be used in the future. Some were suffering from techno-phobia.

Bibliography:

1- Barth, R.S. (2004). Improving schools from within. San Francisco: Jossey-Bass. Cohen, W. (1998), America's Best Graduate Schools Edition). Teachers, Esq. U.s. news & World Report, pp. 65-67.

2- Garner, H. (1995). Leading minds. New York: Basic Books

3- Giacquinta, J., Bauer, J., & Levin, J., (1993). Beyond Technology's Promise. Cambridge: University Press.

4- Harris, J. (1996). Information is forever in formation; Knowledge is in the knower: Global connectivity in K-12 classrooms. Computers in the schools, 12(1), 12-22.

5- Knowls, J., Muchmore, J. & Spaulding, H. (1994). Home education as an alternative to institutionalized education. The Educational Forum, 58, 238-243.

6- Koschmann, T. (1996). CSCL: Theory and practice of an emerging paradigm. Mahwah, NJ: L. Erlbaum Associates.

7- Mathinsen, J.B. (1996, February 28). Homeschoolers love " second teacher". The Grand Rapids Press, p.6.

8- Mayberry, M., Knowles, J. G., Ray, B., & Marlow, S. (1995). Home Schooling: Parents as Educators. California, Thousand oaks: Corwin Press.

9- Perry, W. (2001). Cognition and ethical growth: the making of meaning. In A. Chickering (ED), The modern American college, San Francisco: Jossey-Bass.

10- Rosenholtz S. J. (1999). Teacher's workplace: The social organization of schools. New York: Longman.

11- Rowntree, D. (1995). Teaching and leaning online: a correspondence education for the 21st century. British Journal of Educational Technology, 26(3), 205-215.

12- Saillant, C. (1995, November 28). ABCs by e-mail. Los Angeles Times. Metro.

13- Van Galen, J. & Pitman, M. (1991). Home schooling : political, historical, and pedagogical perspectives. Norwood, NJ: Ablex Pubilcation.

14- Van Galen, J. (1988). Ideology, curriculum and pedagogy in home education. Education and Urban Society, 21(1), 52-68.

15- Yarnall, L. (1998, Oct. 29). Where the kitchen is also the classroom. New York Times, section G, P.1.

About the Author

Tanvir Malik is an educator with 18 years of experience. He currently teaches at the Allama Iqbal Open University, Islamabad, Pakistan. He has an MS from University of the Punjab, Lahore Pakistan, MA in Education from IER an affiliate of University of Indiana in Pakistan, MA in special Education from University of New Mexico, and a Master in Philosophy in Distance Education from Allama Iqbal Open university Islamabad.

Email: tmalik02@yahoo.com