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Editorial: Ideas whose time has come back

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This issue of IRRODL contains papers from Brazil, Greece, Sri Lanka, Canada and the US, and reviews of distance education developments in Africa, Asia, and the Caribbean. A new world of distance education (DE) is coming together in the developing world, as old media such as radio and the telephone merge with each other and the Internet to form wholly original interactive partnerships. So I now offer you a new piece of jargon, coined to pay respect to the creative return to older DE media: 'paradigm rollback' – you heard it here first! This odious but quite typical piece of verbiage signifies "a shift back to an idea whose time has come," as in the case of DE technologies supplanted for a while by the promise that the Internet would do the job better. I just looked the term up on Google, and find only one reference to it so far – in the conference presentation where I coined the term a week ago! Let's see how many references there are to 'paradigm rollback' a few months from now among those for whom jargon is all . . .

The first paper by Stella Porto and Zane Berge discusses how DE is shaped by the socio-political context. Brazil is a developing country undergoing rapid globalization, yet much of its legislation remains rooted in past practices. Porto and Berge argue that legislation in Brazil is currently inimical to the deployment of public DE throughout the country. Private sector companies have stepped in to fill the void created by this problem, in the effort to serve employees' training needs. The downside of this trend, Porto and Berge argue, is that private sector efforts will widen the digital divide between Brazil's urban/ rural and rich/ poor.

The socio-political theme is also pursued by Gerasimos Koustourakis, Chris Panagiotakopoulos, and Dimitris Vergidis in a study employing a Bersteinian theoretical framework at The Hellenic Open University (HOU). The work is grounded within the larger Greek geopolitical landscape, by showing that HOU was born with one foot in the DE world and the other in the traditional educational environment, and that this bifurcated approach is being used to inform other universities' DE practices throughout Greece. The authors argue that it may not be wise to use the HOU as an exemplar at this juncture, owing to the scant research so far conducted into the efficacy of its DE practices.

The remaining main section papers are from North America. Sherry Piezon and William Ferree discuss *Perceptions of Social Loafing in Online Learning Groups.* The witty and thought-provoking concept of social loafing points to an entirely different form of online behaviour compared with that commonly described as 'lurking.' The paper discusses how students' 'loafing' can affect the process and outcomes of online learning, especially in group contexts.
It is followed by a study of *Online Self-Regulatory Learning Behaviors* by Lucy Barnard, Valerie Paton and William Lan. These authors discuss how positive perceptions of online course communication and collaboration have been associated in the literature with better learning

outcomes, while self-regulated learning behaviors have been linked to academic achievement. Their results, however, indicate that the actual picture is not that simple.

In a related paper, Arbaugh examines and validates the popular Community of Inquiry (CoI) framework for online education, and presents empirical evidence of CoI's ability to predict both perceived learning and satisfaction with the online delivery medium.

We then have a report by Terry Müller who examines the persistence of women as online learners in degree-completion programmes at a college in the Northeastern United States. Müller's study indicates the many barriers to online learning encountered by women, and the gap between this reality and the promise that online university-level courses would provide them with increased educational access, flexibility, and convenience. The paper's constructive finding is that women's persistence in online learning can be increased by efforts to boost their motivation levels in relation to particular personal attributes.

One such attribute, 'emotional intelligence' (EI), is then discussed by Robin Berenson, Gary Boyles, and Anne Weaver, in a study of the relationship between students' EI and final grade point averages. The study indicates that EI profiles can help to predict the students who will become successful online learners, and that 'soft EI skills' can enhance academic success.

The final paper by Gabriella Brandes and Natasha Boskic indicates that the online 'e-portfolio' activity has particular potential for increasing student motivation, satisfaction, and achievement. This Canadian study demonstrates that e-portfolios can be valuable not only for compiling students' learning activities, but also in a central repository that students can use to support one another's learning and to develop collective expertise.

The final sections of this issue contain a Research Notes report from the Open University of Sri Lanka about *Instructional Strategies in Teaching Engineering at a Distance.*

We then have two book reviews on *New Directions in University Education: Perspectives from the Caribbean*, and *Collaborative Learning: Two perspectives on theory and practice.*

The latest installments in the popular Technical Reports concern *The Return of Educational Radio*, and *Mobile Learning in Developing Nations.* As at the beginning of this editorial, we see the timeliness and validity of the new 'paradigm rollback' concept!

This typically large edition of IRRODL ends with re-broadcasts of recent sessions organised by the Canadian Institute of Distance Education Research. Over to you!

Jon Baggaley, Guest Editor.

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Distance Education and Corporate Training in Brazil: Regulations and Interrelationships

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Abstract

Distance education in Brazil has evolved more slowly than distance education offerings in other developing countries. This is because all aspects of Brazil's publicly-funded educational system are excessively regulated, highly bureaucratic, and tightly centralized. Such highly centralized bureaucracy and strict control has resulted in tremendous hurdles that work to thwart the adoption, provision, and diffusion of distance education. This is not good news: Like many developing countries, Brazil is also characterized by wide gaps in wealth distribution, with 20 percent of its population functionally illiterate and living below the poverty line. Distance education, therefore, could be used to help train Brazil's citizens. Brazil's emerging status in the global economy, however, is generating enormous opportunities that are fueling demand for change. For example, in their quest to be competitive in the emerging global economy, Brazil's corporate sector has addressed this challenge by establishing corporate universities to train and educate their employees; much of this corporate training and education takes place online and at a distance. The established and emerging educational opportunities provided by Brazil's corporate sector, in turn, is fuelling the demand for the provision of distance education throughout Brazil. Indeed, most Brazilians are ready for distance education. Many Brazilian households own television sets and cellular telephones, and its expanding communication infrastructure has capacity to support distance and continuing education models. Moreover, this capacity is currently being used by Brazil's rapidly expanding corporate university sector. In spite of Brazil's emergence in the global marketplace and its private-sector educational success stories, Brazil's public educational institutions have not kept pace. This is due to Brazil's long-standing stringent regulation of its public education sector. Recent public initiatives, however, such as the *Open University of Brazil,* do hold promise in fueling the growth of distance education to meet the needs of its citizens, poor and rich alike. This paper analyzes the evolution of distance education in Brazil. It explores interrelationship between the nation's corporate and publicly-funded higher-education sectors, and the influences Brazil's highly regulated distance education practices has on the corporate environment. The paper concludes with a broad-brushed overview of 'success stories' of Brazil's corporate universities.

Keywords: Brazil; corporate universities; higher education; distance education

Introduction

Geographically, Brazil is the largest country in South America and the fifth largest country in the world (National Geographic, 2007). Brazil's current population is approximately 190 million; 68 percent are between the ages of 15 to 64 years (The World Fact Book, 2007). Unlike many of its Spanish speaking neighbors in South America, Brazil's native language is Portuguese. Just over 80 percent of Brazil's population is functionally literate (i.e., defined as basic reading and writing skills for those 15 years or older).

Brazil's history as an independent state is divided into different periods, based on the kind of government, starting with the Old Republic (or First Republic), which lasted between 1889 and 1930. The period is marked by a constitutional democracy, where presidents from the two major agricultural South Eastern states of Minas Gerais and São Paulo would alternate in power. It was time of major economic dependence on mono-agriculture cycles, such as rubber and coffee, where the "colonel" – that is the landowner – was the main prominent and influential figure. The Revolution of 1930 brought into power Getulio Vargas, who became a dictator for almost 15 years. Between 1945 and 1961, Brazil had a sequence of democratically elected presidents. In 1964, a military movement, supported internally by national conservative forces and externally by the United States, resulted in a coup over the current president – Joao Goulart, who was seen as bringing socialist reforms to the country. The fear was that Brazil would become a new Cuba in South America. Brazil entered a long phase of military dictatorship with no free press or free speech. Prosecution, imprisonment, exile, and torture of opposition activists and leaders became commonplace. After decades of military rule, the late 1980s saw Brazil emerge as a democratic state. The 1980s, however, were bleak times for many Brazilians. The South American nation was in the midst of transitioning from military rule and thus lacked economic stability. The 1990s brought nearly a decade of economic inflation, resulting in more economic hardship for Brazilians. The new Millennium, however, has brought greater economic stability to Brazil, as witnessed by its ever increasing participation in the global marketplace. Brazil's economic transformation, however, has happened without any concomitant increases in real wages or employment standards for most Brazilians. In spite of all the challenges currently facing Brazil, however, its economy currently surpasses those of all other South American nations. Indeed, Brazil boasts of well-developed mining, manufacturing, and service sectors, all which help to fuel its economic growth and underpin its economic stability (The World Fact Book, 2007). Although doing business in Brazil is more stable these days, and the nation's economic future looks more promising, many Brazilians still face severe social-economic challenges, such as high domestic and foreign debt, and high unemployment rates of approximately 10 percent. Moreover, over 20 percent of Brazilians currently live under the poverty line. In spite of Brazil's economic emergence in the global economy and related economic growth, there remain wide gaps in income distribution; indeed, Brazil currently has a Gini index of almost 60[i] (The World Fact Book, 2007).

Although many Brazilian households, in certain areas, lack modern conveniences, more than 90 percent of Brazilian households do own a television (approx. 50 million televisions), and new high definition television systems are being planned for the near future. The number of mobile telephones outstrips that of televisions by nearly 100 percent. In 2005 there were just over 25 million Internet users in Brazil; by 2006, the number of Internet users in Brazil surpassed 6 million (The World Fact Book, 2007). In spite of Brazil's rapid uptake of communication technologies, wide divisions persist between the rich and poor. Today, one of the greatest challenges facing Brazil is that a significant portion of its citizens are illiterate and live below the poverty line. In spite of this apparent "digital divide," Litto (2002a) predicted that because

Brazilians are embracing technology, they are becoming "rather impatient with printed materials" (¶ 2). In other words, Brazilians are culturally open to technology and the change it brings with it. In terms of culture and infrastructure capacity, most Brazilians are generally well positioned to embrace and benefit from continuing education models, including distance education.

This paper analyzes the evolution of distance education in Brazil by focusing on corporate vis-à-vis its public higher education sectors, and the impact Brazil's current regulatory environment has on these public and private sector educational initiatives. This paper provides examples of distance education in Brazil, and draws parallels from both the public and private educational sectors to illustrate its argument.

Education in Brazil

A quick overview of Brazil's historical legacy reveals several factors that influence its current approach to education. In the early 1800s, Brazil's first higher education institutions were created. It was during this time that a domestic press emerged and publications were allowed in the Portuguese colony. Shortly thereafter, Brazil gained political independence from Portugal in 1822. But in spite of these significant inroads towards independence, an extremely powerful political and economic elite still maintained control of Brazil, achieved primarily through their political dominance in Brazil's governing and administrative bodies. Unfortunately, Brazil's ruling elite did little to ameliorate the living conditions of poorer citizens. For example, the period in Brazilian history called the "First Republic" (1890-1930), only 25 percent of the population was deemed literate (Anderson, 1991). According to Anderson (1991) and Litto (2006), this historical legacy of elitism resonates to this very day, and is responsible for the cultural reification of Brazil's longstanding relationship to power, policy, and control. Brazil can currently be characterized by "centralized dominance" wherein any "organized activity or spontaneous solidarity" (Litto, 2006, p. 4) tends to be either tolerated and/ or silenced. Moreover, this ongoing dynamic of cultural reification and essentially unquestioned compliance to hegemony of Brazil's ruling elite tends to reinforce and legitimize the nation's highly centralized and highly plutocratic power and control structures. Corruption and nepotism are not only natural consequences of culturally surrendering to Brazil's ruling elite; such behavior tends to be viewed as commonplace and perhaps even normal.

It is the authors' observations that such characteristics remain embedded in Brazil's current government. Moreover, this level of acceptance of the power structures of its ruling class strongly influence all Brazilian institutions on all levels of governance, from federal to local administration. Brazilians tend to be mostly inured to such intrinsic corruption, because it has been the way that life is in Brazil. Citizens tend to believe that anyone coming into power will repeat self-serving behaviors of their predecessors, independent of whatever party or political background they represent. Brazilian politics is now the brunt of many jokes, and many citizens are starting to express disillusionment. The summative effect is that many Brazilians now lack confidence and trust in their government.

Culturally, Brazil embraces its strong tradition of "patrimonialism" (Litto, 2006), meaning most Brazilians tend to be comfortable following the dictates of the status quo – following the laws set forth by Brazil's centralized and highly patriarchal powerbrokers, without questioning them too deeply. This level of broad-based cultural acceptance reificates and reinforces political favoritism and nepotism within Brazilian bureaucratic organizations, including its public higher educational institutions. As such, Brazil remains subject to over-regulation and bureaucratic red-tape that formally and informally legitimizes current power structures, and thus presents formal and

formidable obstacles to 'getting things done' in the new global economy that demands a well-trained workforce.

Brazil's Ministry of Education, the nation's highest regulatory authority overseeing and administering the country's educational system, has a long history of governing its educational system by means of legislative decrees, most of which are not formally debated in parliament. More often than not, Brazilian society simply accepts the conduct of its politicians and bureaucrats without significant questioning or challenges. Brazilian's culture of 'shoulder-shrugging acceptance' has an arguably direct and negative impact on innovation, experimentation, and creativity. Indeed, the subtle shift from *government* to *governance* observed in other developing countries in recent years has yet to take shape in Brazil. As a result, in terms of deploying distance education methods to meet its ever escalating educational needs, Brazil's public education sector has not kept pace with advances experienced in similarly developing countries.

Brazilian Distance Education

According to recent studies of underdeveloped countries (Romiszowski, 2005), the creation of dedicated distance education higher education institutions have resulted in an increase in service capacity, sometimes by as much as 20 percent. Some project that the adoption of distance education in dual-mode higher education institutions in these countries will eventually serve more than 50 percent of the students enrolled in higher education. Unfortunately, Brazil is not yet on this list of successful national case studies.

When examining and pondering the reasons why distance education has not been readily adopted by Brazil's higher education system to expand access, Litto (2002a) opined that such dismissal relates directly to Brazil's highly centralized and regulated education system. Litto also cites the "widespread lack of credibility of [distance education] approaches both inside and outside academic communities" (p. 1) as another factor impeding the deployment and use of distance education throughout Brazil.

Indeed, Brazil can be categorized as belonging to the old European school in terms of its highly centralized approach to administering education (Litto, 2006). Unlike Europe, which has relaxed its rules, Latin America as a whole, and Brazil in particular, has not evolved, and over time its educational system has become even more inflexible, and its rules non-negotiable. For example, legislative planning time is typically short, changes are frequent, and this dynamic results in instability, lack of trust, and an increasing misuse of bureaucratic power (Armengol, 2002). Moreover, according to Litto (2006), Brazil, an enormous nation in both size and population, presents an "uneven history of growth and development in the use of learning at a distance" (p. 1). The historical factors leading to Brazil's increasingly bureaucratic regulation over distance education have also been identified by Romiszowski (2005). From 1998 through 2001, diplomas from foreign universities earned at a distance education were not officially recognized in Brazil (Litto, 2006). Additionally, all post-secondary diplomas and degrees were only allowed a ceiling of 20 percent of distance learning time. Brazilian distance education courses to this day require students to interact with their institutions face-to-face for examinations, final project presentations, and dissertations. In addition to these formally legislated barriers, are fears that academic dishonesty will prevail and that Web-based learning lacks any real pedagogical ability to educate effectively. Despite these perceived obstacles, there are currently three million learners enrolled in courses offered at a distance throughout Brazil. Of these three million distance students, 1.5 million are registered in corporate initiatives. Of these private sector educational

offerings, *Telecurso 2000*, currently serves over .5 million students and delivers "primary and secondary school education to adults through open-circuit television and printed material" (Litto, 2006, p. 12). The remainder of Brazilians studying at a distance tends to be enrolled in a variety of authorized extension courses, university programs, vocational education (Bof, 2004) and radio-based courses (Wikipedia, 2008).

In December 2005, Brazil's president signed new laws into effect, thus "establishing the policies and norms of distance education in the country" (Litto, 2006, p.13). These laws (MEC, 2005) legislate that for basic education (i.e., primary and secondary levels) Brazil's accredited institutions are only legally allowed to offer distance education under two extenuating circumstances: learning complementation and emergency situations. In cases where distance education courses are designed to deliver basic level adult education, current law deems that it is under the authority of Brazil's state- and city-level jurisdictions to administer these offerings. In higher education (including undergraduate and professional education), institutions must adhere to accreditation processes as defined by Brazil's Ministry of Education, whether such programs are delivered at a distance or in traditional face-to-face modalities. All institutions must be accredited to deliver graduate-degree programs of study. In case of the '*lato sensu*' graduate programs – that is graduate programs without dissertations – all institutions must include face-to-face components, such as sitting for exams and defending final projects. Foreign degrees are only deemed transferable (i.e., recognized and registered by Brazilian universities) if they are accredited programs that cover the exact same content area. Legislation dating 2001, established that foreign institutions offering '*stricto sensu*' graduate programs (i.e., programs with dissertations), directly or through partnership with Brazilian institutions, must immediately stop enrolling students. Arguably, this law illustrates the growing rigidity of Brazil's educational system, and attests to growing centralized decision-making taking place in Brazil's education sector. It is the authors' opinion that such legislation can potentially result in erecting roadblocks and bottlenecks the accreditation process.

In 2005, the creation of the *Universidade Aberta do Brasil* (Open University of Brazil – UAB) a consortium of several state institutions – was put into service to meet the growing demands of Brazilians seeking to complete their studies using a hybrid model of distance education and supported through a network of local learning centers. This project was a creation of the Ministry of Education, together with several of the major Government companies and Federal Universities in an attempt to democratize access to higher-education. UAB is not a new institution, but a system created to coordinate the efforts of different educational entities, at federal, state, and municipal levels, in the offering of higher-education in different modalities of distance education. One of the major activities within this project is the creation of local centers in areas where the access to higher-education is scarce. The project prioritizes the qualification of teachers working at the elementary level who have not yet obtained an undergraduate degree.

Figure 1. Screenshot of *Universidade Aberta do Brasil* homepage

This initiative is a response to 2005 legislation, which required teachers, including those teaching at the elementary school level, to be qualified through an undergraduate degree. Since the inception of UAB, hundreds of these local centers have been created throughout the country. The participating institutions (all state run) will be able to offer courses through these centers to students who would not be able to engage in the higher-education system otherwise. The programs offered through UAB are also offered to those who have completed their secondary degree and have been approved previously in the selective entrance process of any of the higher-education institutions. It is too early to assess the success of this effort, however. Clearly, much will depend on the administrative and cooperative efforts of federal institutions of higher education and state- and municipal-level efforts, the latter of which must provide the local study centers and the front-line tutors who interact with students face-to-face, via phone, and via the Internet. In 2007, a similar initiative started at the professional education level. The Ministry of Education inaugurated the *eTec Brasil – Open Technical School System of Brazil*. The focus is the development of technical professional education using distance education, again with the goal of democratization of access. The interior of the country and the outskirts of Brazil's greater metropolitan areas are the target areas for supporting centers, which will be mainly located in municipal elementary school facilities to be adapted for these new functions. The model of distance education is similar to the one considered within UAB – that is print and other media materials developed specifically for these programs, which can be sent to students. Students will also interact with tutors face-to-face in the local centers. Face-to-face time, however, is again a requirement for assessment and major lab activities (Ministério da Educação, 2007).

In spite of these recent hybrid initiatives, distance education in Brazil is still dominated by the use of print materials (Takahashi, 2006). Although the use of online education and CD-ROMs are ranked just after print materials in terms of production, distribution, and use, Brazil's higher educational institutions offering hybrid education still rely on a predominance of print-based learning materials for its distance components. This reality shows that Brazil's distance educational model still remains outdated, which can be viewed as inimical to student success, especially in light of the pervasive use and ownership of computers throughout Brazil. Indeed, the current hybrid model of distance education delivery remains more focused on traditional forms of course development delivered primarily through print based materials, which are then augmented by traditional face-to-face tutoring at local study centers and/ or via other technologies, such as television and online interaction with tutors. Because Web-based student-to-student and student-to-teacher interaction is not at the core of the pedagogy for distance education, the overall progress and effectiveness of distance education throughout Brazil lags far behind inroads being made in other developed and developing countries that are striving to embrace more informed models of distance education. Indeed, one will not find group activities or group assignments as part of distance education offerings in Brazil. Moreover, traditional programs tend to overwhelm its distance education components, and thus the pedagogies more relevant to face-to-face instruction and negate the power and effectiveness of its distance education components. Distance education should, ideally, be premised on pedagogical models that best underpin that delivery and learning method.

Given the legislative restrictions currently imposed on Brazil's public higher-education sector, Litto (2001; 2002b) determined that *hybridization*, that is the combination of face-to-face and distance delivery modalities, is nonetheless currently the best method to tap into distance education's potentialities. He also notes, however, that exceptions do exist for extension courses and non-degree programs, which can be wholly delivered at a distance. Litto (2002b) also observed that private-sector corporate universities, which currently operate apart from governmental controls, are increasingly expanding their educational offerings across Brazil to meet their corporate learning objectives. Clearly, the success of the corporate learning initiatives could well fuel demand for changes to start taking place in education across Brazil. Without access or use of technology-mediated communication in the form of Internet and Web-based learning, it remains questionable whether or not Brazilians will truly be prepared for the modern version of e-learning, whether it is currently offered from private-sector corporate universities, or from public education institutions someday down the road.

Two additional factors are blocking the adoption of distance education in Brazil: 1) there is currently no dedicated DE higher-education institution in Brazil, and 2) most of Brazil's public tertiary-level education is free, and thus funding for such e-learning initiatives come from public sources. Moreover, because Brazil has no established – let alone emerging – academic tradition in e-learning pedagogy and delivery, it is difficult to find homegrown experts to establish and manage distance education on a larger scale. Indeed, experts in charge of distance education in Brazil tend to be "academics with only a theoretical knowledge of distance education. . ." with "their practical experience is firmly rooted in the conventional face-to-face practices of the existing higher education institutions" (Romiszowski, 2005, p. 6). Another consideration is that Brazil's higher educational system lacks a market-driven focus. "Customer service" is simply not on the radar screens of most Brazilian public higher educational institutions, primarily because they are already being flooded with applicants. In most cases, only the best and brightest Brazilians are able to enter and benefit from their public higher education system. Moreover, the success of any given applicant is very much determined by the high school they attended prior to entering Brazil's higher education system. And given that Brazil's secondary school system is dominated by private-sector for-profit educational providers, few if any students from Brazil's

under funded public school system will likely qualify for entry to higher education. While a good education is clearly important, many students from underprivileged backgrounds and socio-economic situations can be successful learners. This illustrates that Brazil's higher education system does not cater to, nor does it support, students from the lower rungs of its socio-economic ladder. Moreover, because funding for Brazil's public higher educational institutions is not reliant on socio-economic factors, the handful of poor and disadvantaged students who do get admitted tend not to complain primarily because they are simply happy to have been accepted to receive free education in the first place.

DE Initiatives in Brazil's Corporate Universities

There has been significant growth in the number of corporate universities in Brazil in recent years. In the late 1990s, there were fewer than 20 corporate universities operating in Brazil; by 2003, however, that number expanded to 150 (Posseti, 2005). Many large private sector corporations such as *Ambev* (beverages), *Accor* (hotels), and *Santander Banespa* (banking) are investing in the development of continuous educational offerings for their staff and executives. In many cases, third party organizations are called upon to offer customized and off-the-shelf corporate training programs. This is the case of *Ibmec* (telecommunication) a corporate university operating out of São Paulo. From 2004 to 2005, *Ibmec* saw demand for its distance education offerings skyrocket by 40 percent, followed by a 30 percent increase for 2006. One of the main characteristics of these corporate universities is that they can offer customized learning solutions to meet their customers' various educational needs and contexts. For example, the most commonly searched topics are: entrepreneurship, innovation, and creativity – all search terms that are illustrative of Brazilians' growing interest in doing business.

Litto (2002a) found many commonalities among Brazil's corporate universities. First, they are mainly seen as 'umbrellas' under which each company builds and organizes their corporate educational design and delivery systems. Their primary focus tends to be on continuing education with the aim of continually upgrading their employees' skills and knowledge to better serve their clients, suppliers, and the community they serve. The goal of their distance delivery curriculum tends to be related to basic or advanced use of technology; business competencies; corporate culture and values; general culture; and basic primary and secondary education. Other corporations have partnered with these private-sector academic institutions for external assessment purposes, and established programs that allow 'certification.' In most cases, Brazil's corporate universities operate under the direction of the company's human resources division, which in turn, reports to the chief executive officer. Corporate universities, which have historically relied on face-to-face modes of instruction, have, since the mid 1990s, moved to embrace distance mode of delivery. Today, many are using Web-based e-learning and virtual environments. As expected, these company's corporate universities had to bear high initial investment costs in the design and delivery of e-learning, but such investments were subsequently offset with gains in employee productivity and overall performance. In some cases, corporate training and educational initiatives has been so successful that these corporate universities, sensing new market opportunities and growing demand, have created their own 'educational brand' and have moved to offer their services to outside companies.

There is no consensus among corporate universities, however, on the buy-or-build issue. Some corporate universities have opted to produce their own materials independently, while others have outsourced their educational initiatives. Moreover, in Brazil's highly centralized and bureaucratized public educational system, certification still remains a thorny issue that has yet to be resolved.

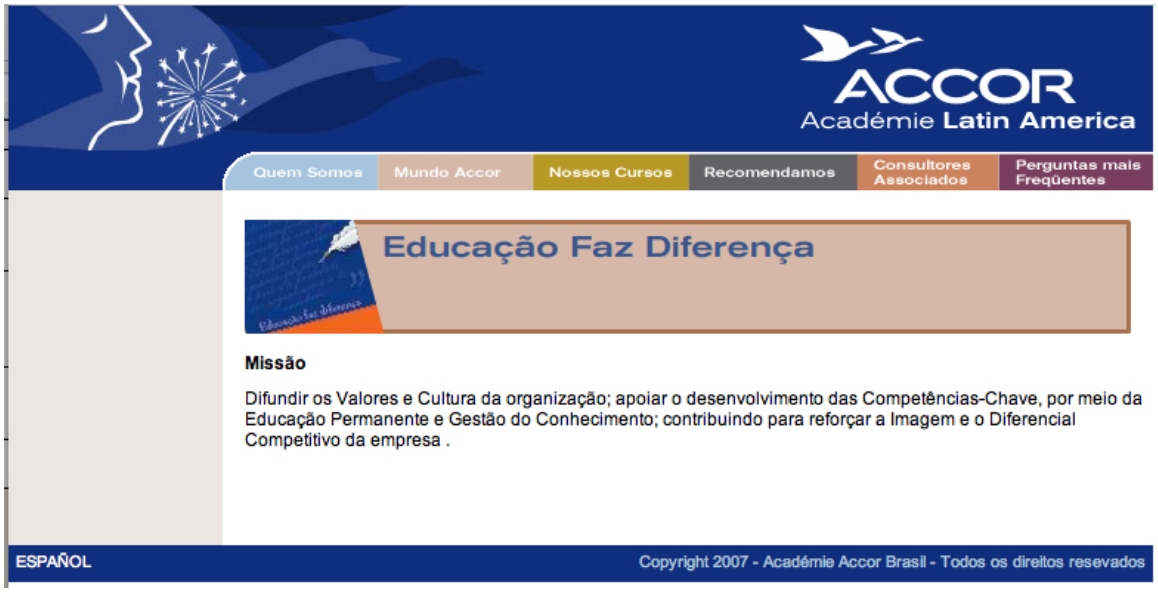
Figure 2. Screenshot of Ambev Brazil main webpage

Ambev beverage's sector (AmBev, 2008) is one of the corporate pioneers in the genesis and growth of Brazil's corporate university system. In 1995, the company created the Brahma University, which was later changed to Ambev University (UA) (Posseti, 2005). Besides offering traditional face-to-face courses, UA also provides Ambev TV. Ambev TV employs satellite television and as such, its televised course offerings are broadcast nationwide simultaneously. Interestingly, television has been one of the major success stories in Brazilian distance education, underscoring the reality that Brazil's delivery capacity does, in fact, influence its corporate sector selection in terms of technology and media used for training and educational purposes.

Figure 3. Screenshot of Accor Brazil main webpage

The Accor Group operates hotels and related services (Accor, 2008) and is headquartered in France. The Accor Group launched Brazil's first private-sector corporate university. Initially, the Accor Academy was established in Campinas, a neighboring city near São Paulo. The first course offered by Accor Academy was in the business subject area of 'leadership,' a course that is still offered to this day. A training unit still exists inside the company that provides training necessary for specific jobs and positions within the *Accor Group*. In sum, the Accor Academy is investing in its employees by providing them with the education they need to be prepared for changes happening in the global economy. Accor Academy's goal is to provide that company with a competitive edge pure and simple, and its employees benefit by becoming more rounded and better informed professionals.

Figure 4. Screenshot of Accor Academie Latin America webpage



Embratel is Brazil's main telecommunication service provider. *Embratel* owns several subsidiaries: *Brasilcenter*, *Star One*, and *Click 21*, which combined employs approximately 12,000 people throughout Brazil. *Embratel* makes extensive use of its corporate intranet for corporate training and educational purposes. *Embratel* enjoys a long and established track record of investing in its employees. Indeed, before *Embratel*'s intranet became operational, it was already using CD-ROMs and videos for corporate training purposes. The company's first e-learning initiative took place in a partnership with the *Pontifical Catholic University*, and in 2004, *Embratel* deployed a new software platform for e-learning management. The intranet is coordinated by the Embratel Corporate University (UCE) and operates under the umbrella of *Embratel*'s human resources department. *Embratel*'s intranet content is clearly differentiated to serve its different corporate business units' unique educational needs. Each business unit can quickly access audiovisual training resources, online courses, and face-to-face training sessions. *Saba Centra* (Saba, 2008) software has also been used for virtual meetings and for other live instructional events such as conferences and workshops (Eboli, 2004). In most cases, learning and interaction is synchronous and typically supplemented with independent, self-paced study activities.

Figure 5. Snapshot of the Santander (Brazil) main webpage

The Santander Group – banking and investment sector (Santander, 2008) – has for more than 10 years been developing the Santander Universities program, which in collaboration with Ibero-American universities constitutes the axis of the corporate social responsibility of this organization. Today, there are more than 507 collaborative agreements that benefit approximately 9 million students and researchers, and almost 10 thousand scholarships are given. One important initiative of Santander Group in the educational arena is the *Universia Portal* (Universia, 2008). Universia was launched in Brazil in 2002, and since then it has established partnerships with more than 245 teaching institutions. This portal integrates and develops content and services according to the needs and requests from partnering institutions. It is used as a diffusion mechanism of news in the academic world about topics that include career, distance education, scholarships, scientific publications, and so forth.

Figure 6. Snapshot of the Universia (Brazil) main webpage

Conclusions

Old issues will undoubtedly influence and shape Brazil's future. The country must grapple with poverty, chronic employment, and issues surrounding increased and egalitarian access to education. Resolving these problems will help to reduce inequalities and consolidate and rally the Brazil's human resource capacity to compete more effectively in the global economy (Eboli, 2004). Corporate universities have been rising to this challenge – albeit mostly out of necessity to ensure their people have the right skills and knowledge they need to be competitive – and as such, the pace of distance education and e-learning has picked-up, primarily thanks to Brazil's corporate sector. These corporate universities have had helped to mobilize and prepare many Brazilians employed by these corporations (and for other corporations that contract with corporate universities). Nonetheless, most Brazilians, especially those hailing from poor families, rural regions, and impoverished socio-economic groups, have had little or no exposure to distance education or e-learning, let alone the opportunity to collaborate in any sort of online environment. Without basic exposure to e-learning, many Brazilians will simply not be able to participate and benefit from Brazil's growing economy.

The ongoing and chronic disconnect between the realities of what Brazil's public sector educational institutions can actually provide versus the nation's need for a highly skilled workforce, makes it extremely difficult to establish productive and meaningful collaborations between Brazil's private-sector corporations and its publicly-funded higher educational institutions. Brazil's Ministry of Education's long history of unreliable legislation and enforcing inflexible regulations, all of which is administered via its highly centralized bureaucracy, has jeopardized the legitimacy and lessened the impact of its publicly funded educational institutions. Oftentimes, Brazil's public universities are simply unable to use distance learning technologies (i.e., they are too highly regulated) and therefore lack the human capacity to use new and emerging e-learning technologies effectively.

Ongoing and insufficient access to quality public education – much of which can be delivered online and at a distance – is hampering most Brazilians' ability to participate effectively, and benefit from, fruits of the global economy. With nearly 20 percent of Brazilian citizens still living below the poverty line, and many more working poor who simply lack resources to pay for education, illustrate that deep social inequalities are pervasive. And although many corporate universities have made inroads in meeting their own corporate educational needs, such corporate e-learning initiatives will likely also suffer. This is because Brazilians, although they have the infrastructure and have culturally embraced communication technologies, still suffer at the hands of inflexible legislators and view corruption as normal in Brazil. In this self-serving environment, corporate e-learning initiatives will be hard pressed to truly succeed. The good news is that the globalization of Brazil's economy – of which its corporations are at the vanguard of distance education – is fueling demand for change, and such growing demand will likely influence Brazil's culture. As discussed in Eboli (2004), recent studies show that corporate universities are viable, and the use of e-learning has played a significant role in expanding access to education – albeit on a corporate level.

As these corporate-based employees use, gain proficiency, and benefit from workplace-centered e-learning, they will likely fuel demand for concomitant changes to occur across all of Brazil's higher education institutions. Demand for distance education to serve Brazilian citizens living far from metropolitan centers (where the universities are located) will likely increase. Higher education and continuing education, which is one of the drivers of online education, will be affected by current regulations that currently limit the amount of course work that can be done at a distance. Several enterprises are already playing an important role in this process through their focus on providing education and training to their workers, and no doubt others will follow.

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[i] The Gini coefficient is a measure of statistical dispersion most prominently used as a measure of inequality of income distribution or inequality of wealth distribution.

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A Contribution to the Hellenic Open University: Evaluation of the pedagogical practices and the use of ICT on distance education

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Abstract

This study examines a) the methods used to structure the pedagogy necessary to underpin distance education delivery used by the Hellenic Open University (HOU); b) the adoption of pedagogical and epistemological conceptual systems HOU uses for the development of its pedagogical practices; and c) the role of information and communication technology (ICT), and the degree of ICTs incorporation into distance education delivery at HOU. This study shows that: a) in terms of providing rigorous course contents, strong framing exists between HOU's various learning modules; b) in terms of pedagogical practices, there is a strong hierarchical relationship and framing between HOU's academic staff and tutors, while conversely, framing is weaker between its tutors and students; c) in terms of ICT usage HOU, in general, uses technology for administration, while conversely, and depending on the program of study, it currently only has limited use for student learning.

Keywords: Hellenic Open University; pedagogical practices; distance education; ICT

Introduction

Distance education (DE) constitutes an important and integral teaching/ learning methodology, one that many feel will support emerging growth trends in education and training worldwide. Various forms of DE delivery, particularly those based on the use of information and communication technology (ICT) tends to be included in the operational scope of many higher education institutions. Adoption of ICT, however, creates significant pedagogic, economic, and organizational challenges for many educational institutions, oftentimes leading to intensified globalization (UNESCO, 2002). Universities oriented towards the use of open and distance learning were first in-line when it came to adopting new and emerging technologies, actions that heralded an new era of increasing access to further education and training (Goho, MacAskill & McGeachie, 2003; Gray, 2004).

Few critical studies examining the pedagogical practices used by HOU have been conducted to date. As such, this study was designed to critically analyze Hellenic Open University's pedagogical framework and its provision of DE, which for most higher education institutions is achieved through the deployment and subsequent use of ICT. The theoretical approaches

articulated by Basil Bernstein were used as the theoretical framework for this study, specifically his concepts about classification and framing.

The theoretical work of Bernstein opened new avenues in sociological research by analyzing the emergence of educational knowledge and pedagogical practices. In simple terms, Bernstein helps to shed light on, and deeper understanding of, the educational processes that unfold inside educational institutions (Morais, Neves, Davies & Daniels, 2001; Sadovnik, 2001; Singh, 2002). Today, DE is typically viewed as a viable alternative that can open doors to students who need a second chance. Moreover, DE is seen as a panacea to the promotion of lifelong education throughout Greece. What is troubling, however, most studies underway tend to be focused on graduate level studies and attempt to apply distance learning models used by HOU. Moreover, such studies are seeking to inform the production of educational material for DE studies throughout Greece (See Malapanis, 2006; Papaleksiou, 2006; Savelonas, 2006). But these studies are happening without adequate attention paid to the validity and rigor of its source – The Hellenic Open University itself. Our study attempts to fill this logistical void in research by using the Bernsteinian approach, primarily because it has been successfully used in the evaluation of the university level pedagogical processes and procedures used to inform and develop the delivery of DE. Indeed, the Bernsteinian theoretical points have underpinned many studies that aimed to investigate and understand the pedagogical activities at conventional educational institutions, irrespective if they use ICT in their educational processes or not (Apple, 2002; Barrett, 2007; Harris, 2001; Newman & Johnson, 1999; Singh, 2004; Singh, Atweh & Shield, 2005).

Distance Education in Greece through the Hellenic Open University

In Greece, DE at the post-secondary level is provided by the Hellenic Open University (HOU), which was launched in 1995, largely with the assistance of European grants from the Community Frame of Support. By the late 1980s, the European Union (EU) had committed to developing its DE offerings in an attempt to train skilled adults needed for the emerging global marketplace (Eliou, 1993). The establishment of the HOU was introduced by politicians as part of Greece's implementation of EU policies. The origins of HOU can be traced back to 1992, when the Greek Conservative Party of New Democracy was in power. That party introduced a bill proposing HOU in the Greek Parliament, which was voted on in September 1992. This bill referred to the process of "training and further education" of the students attending conventional Greek universities. It also proposed that HOU's administration be carried out by an academic council comprised of the Rectors and the Presidents of administrative committees hailing from all Greece's higher educational institutions (Lykourgiotis, 1998). According to Lionarakis (1996), this bill – which incidentally never came into force – "raises the problem of identity of HOU and does not allow it to introduce those new methods that are essential for an open university in a conservative education system" (p. 56).

The HOU was then resurrected when the socialist government of Panellenic Socialistic Movement party came into power. Subsequently, in October 1995, an official administrative committee was struck and comprised Greek academic specialists who collaborated with specialists from the British Open University, and from other open universities throughout Europe. The committee's objective was to acquire the "know-how" needed to successfully launch and run a Greek open and distance learning institution. The task of this committee was to: a) work out the university's framework, b) develop a detailed bill for the establishment of the HOU, and table this bill with the Greek Ministry of Education Affairs (*n.b.*, this bill was different from the one

outlined in 1992); and c) start offering courses leading to several degrees (Koustourakis, 2006; Lionarakis, 1996; Lykourgiotis, 1998). Thus, from 1995-1997, when the new law concerning the establishment of HOU was voted in, the scientific physiognomy of the university was determined. Moreover, several important decisions were made by this committee – decisions upon which HOU continues to function with to this day. The members of the first administrative committee held their posts until June 2004. But national elections were held, and when the conservative government of New Democracy was again elected in late 2004, a new administrative committee was appointed comprising university academics and emeritus professors hailing from conventional universities (HOU, 2004). In sum, the members of HOU's current committee were not specialists in open distance learning and their idea of higher educational delivery and pedagogy conflicted with HOU academic personnel because they take a traditional and conservative approach towards HOU's operation (Andritsaki, 2005; Leontidou & Tzamarias, 2005). Thus, the model of HOU, which the first administration committee established, was resurrected and altered by a second committee along more traditional and conservative lines that, arguably, are at odds to open and distance education as a unique mode of delivery.

Indeed, HOU's overarching characteristics were defined and formed by the first administrative committee's decisions (time period 1995 to1997) and was significantly informed by the British Open University model. This historical legacy significantly influenced the formation and operation of the institution (Koustourakis, 2006; Vergidis & Panagiotakopoulos, 2002). And as such, HOU conformed to a single organizational mode model premised solely on DE (Keegan, 1996). According to Farnes (2000), this model:

> . . . provides only distance teaching, usually to part-time students. The curriculum, the media used to teach, student support and accreditation are designed in an integrated way to suit students studying at a distance. The staff are totally committed to distance teaching and have no conflict of loyalties between on-campus and off-campus students. . . There are generally no on-campus student activities, though there may be a regional network of study centres where students and tutors meet. (p.8)

The model of the tutor-counselor, as employed at the British Open University (Sewart, 1980), has also been adopted by the HOU. HOU's planning and organization of its program offerings are based on explicit goals, clear guidelines, and detailed instructions to guide its students and its tutors. According to its instructional publications, HOU adopted Holmberg (1989) ideas on the central role distance learning materials play in students' mastery of distance learning studies. Finally, categorizing the HOU into Farnes' map (1993) which details the different stages of DE development, HOU can be said to be in Farnes' "second generation" of development, in that HOU uses multiple media to realize its DE offerings. This stage corresponds with the Fordist mode of production (Peters, 1994). As may now be evident to many of our readers, higher and lifelong education premised on using fully deployed ICT networks is not a reality in Greece.

HOU also faces internal and administrative challenges, some of which do not support or assist in developing its distance learning methods that can be easily delivered via ICT. The HOU, nonetheless, is welcomed and supported by most Greeks, primarily because it offers them a second choice and, sometimes, a chance at accessing the fruits of education. In the academic year 2006-2007, HOU served 15,026 undergraduate and 8,624 graduate students enrolled in six undergraduate and 24 graduate courses.

Distance Learning, Pedagogical Practices and ICT

Until 2010, the development of a competitive trans-European market of educational and research services, often functioning under auspices of private-economic criteria, will serve as the models of lifelong education available throughout the EU. This is shaping current trends in European higher education and is reflected in a quote by Bernstein (1991), who wrote: " . . . academic systems today join more and more into a campaign about what should be transmitted, the autonomy of transmission, the terms of employment of those transmitting, and the processes of evaluation of the receptors" (p. 146). Moreover, the connection of scientific knowledge to the needs of the EU's labour market is strengthened by the General Agreement on Trade in Services (GATS) agreement of the World Trade Organization. The GATS agreement encourages and facilitates the merchandising of educational institutions and their course offerings outside their traditional geographic boundaries, and underscores the reality that pedagogical practices that are "oriented towards the market" and "arises from the frames of cost efficient education, which is supposed to promote applicable dexterities, perceptions and technology in an era of broad and chronic unemployment of the young" (Bernstein,1991, p. 146) is now a tangible reality. Thus, in the ever globalizing educational environment, the deployment, use, and incorporation of ICT is thrown into the political spotlight, a fact that influences – as much the "knowledge" itself – how this mode of transmission will be used.

According to Taylor (2001) the use of technologies by open universities for the provision of DE can be divided into five models:

1. Correspondence-based on the use of traditional print technology (i.e., books, learning manuals, study guides, etc.)

2. Multi-media for the transmission of information based on audiovisual and print technologies (i.e., the use of CDs and DVDs, etc., coupled with printed materials such as textbooks)

3. Tele-learning based on applications of telecommunication technologies (i.e., face-to-face videoconferencing and/ or educational television)

4. Flexible learning based on online delivery of learning materials and information via the Internet (i.e., on-demand access to downloadable basic learning materials available online)

5. Intelligent flexible learning based on Internet and the Web delivery (e.g., use of Web 2.0 technologies designed to proactively interact with students)

The knowledge and education provided by various higher educational institutions – regardless if they use ICT or not – can be viewed as "socially built" and "socio-ideologically" dependent (Bernstein, 1991; Castells, 2000; Muller & Taylor, 1995). Moreover, knowledge is connected with the selection of specific pedagogical theories used by various social-scientific teams producing, shaping, and promoting its use, flavors and colors the final course offerings. As such, pedagogical theories used tend to be equivalent to the ideological and theoretical positions held by various teams (Bernstein, 1996, 2000; Lamnias, 2002a, 2002b). In other words, a course designed by a professor of engineering will be qualitatively different than a course designed by a professor of languages.

The concepts of classification and framing drawn from Bernstein thus enable the analysis and the evaluation of the HOU's pedagogical practices. These theoretical concepts are discussed in greater detail below.

Classification

Classification describes the terms according to which the relations of power are converted into specialized discourses – that is rules that inform contents (Bernstein, 1996; Sadovnik, 2001). Classification refers to the determination of relations between the various contents, rather than the determination of characteristics of the contents itself (Bernstein, 1996). When classification is strong, there are powerful boundaries between the contents of knowledge and various agents involved in the formulation and promotion of various study programs (Bernstein, 1996). Thus, in instances of strong classification, the cognitive objects taught are clearly distinguishable.

Framing

Framing, on the other hand, refers to: a) the nature of control concerning the regulation of social behavior in communication, and b) the ability of selection (or not) of the teacher or student in the sequence and organization of knowledge; the pacing and the transmission of knowledge; and the criteria on which evaluation is based. In simple terms, framing reveals the transformation of principles of social control in specific pedagogical relations (Bernstein, 1990; 1991; 1996).

Bernstein (1996) describes framing as the result of two forms of discourses: instructional discourse and regulative discourse, which are connected so that the instructional is determined by, and depends on, the regulative. *Regulative discourses* refer to the relations of power existing in each stage of the pedagogical relationship. When hierarchical relationship (either among teachers in an educational institution, or between teachers-students) are visible, then strong framing is said to have occurred. But when they are not visible, as which may happen in an open institution where the teacher plays multiple roles simultaneously, the framing is weaker. *Instructional discourses* refer to the way of transmission of knowledge and are determined by:

> a) *sequence rules*, that is the organization of sequencing of the educational activities, that is what precedes and what follows;
>
> b) *pacing*, that is the elaboration time that a subject takes and teaching pace; and
>
> c) *evaluation criteria*, that is the determination of legitimate or implicit communication and social relations, which, in turn, leads to the formulation of explicit forms of knowledge and established criteria for its evaluation (Bernstein, 1991; 1996).

In situations of strong framing, instructional discourses are determined with precision. This involves sticking to strict timetables and rules, which students are required to observe and apply to successfully complete their studies on time.

The principles of classification and framing adopted and applied by an educational institution determine the type of pedagogical practices developed within that educational institution. In examining the formulation of the pedagogical practices used by HOU, Bernstein's concepts of classification and framing were used, and connected the concepts of power and social control (Bernstein, 1991; 1996; 2000).

In DE settings, the actual educational-teaching materials play a central and arguably a sovereign role. Rowntree (1994), for instance, argued that a successful DE package needs teachers who are both able and willing to help students to learn and master the course contents the minute their 'DE package' arrives. The creation of DE packages involves (a) the process of re-contextualization of the primary scientific knowledge, and (b) using distance pedagogy balanced with instructional design strategies to enhance the delivery, whether it is delivered online or whether they are print-based course materials delivered via postal mail. Moreover, the formulation of various educational packages, irrespective of discipline, involves the selection of scientific knowledge deemed by the educational institution offering the course as important and suitable for students to learn.

Certainly, those responsible for the development of various 'educational packages' and for the planning of an institutions' overall educational policy, adopt some of the existing and accepted pedagogical forms used by the larger social-scientific community. These forms are hereafter called "pedagogical epistemological conceptual systems" (PECS).

By PECS, we mean theoretical epistemological forms that are validated and accepted by the larger socio-scientific community, and which inform the theoretical background for the approach, interpretation, and/ or legalization of the examined educational policies and pedagogical practices (Bernstein, 1990; Lamnias, 2002b; Tsatsaroni, Koulaidis, Lamnias & Sakonidis, 1997). The choice of elements – e.g., admissions by one or more PECS – depends on the objectives and the general and/ or specific theoretical and scientific orientations taken by a given DE institution.

It is noteworthy that from each one of the existing pedagogical and epistemological and conceptual systems that are validated and accepted by the larger socio-scientific community (i.e., empirical, interpretative, or critical pedagogy) different theoretical approaches to pedagogy emerge. Moreover, the conceptual system adopted influences the processes of re-contextualization of knowledge that, in turn, informs the pedagogical practices of specific institutions. Finally, in the operation of a given institution indicators of different pedagogical epistemological conceptual elements and systems can be come evident upon closer reflection and inspection. Nowadays, the sovereignty of individual now reigns as supreme – i.e., student-centered pedagogical theories do exist (Lamnias & Tsatsaroni, 1996; Lamnias, 2002b), which is clearly a paradigm shift that illustrates that "educational packages" now reign supreme in distance education contexts. Times have changed, and this fundamental change must be acknowledged in research on distance education.

Methodology

The study reported in this paper focused on pedagogical practices developed by the HOU. These practices are strongly connected with the use and production of DE learning material and, also, with the possible use of ICT deployed for delivery and educational purposes. The sources of this research project are:

a) The 32 Acts that were articulated during HOU's administrative committee meetings, and upon which HOU's constitution (October 30, 1995) became effective, until (February 25, 1997) when HOU was legally deemed an 'organization' and operational structure determined. As noted earlier, focus was paid on these Acts because the contribution of the administrative committee in this period was decisive in the creation of the academic infrastructure that underpins HOU, and the formulation of the above mentioned law (Lykourgiotis, 1998).

b) Institutional texts – i.e., publications, in printed and electronic form, referring to the organization, policy, academic development and the way of provision of studies.

c) The information provided officially on its website from its foundation until today.

The research questions sought to be answered are:

1. How are the pedagogical practices providing DE built into the HOU? How are they built and shaped by: a) scientific knowledge, b) instructive practices, and c) the practices of evaluation of the training process?

2. Which forms of pedagogical scientific knowledge have been adopted by HOU for the promotion of its own manifest pedagogical practices?

3. Does the HOU adopt policies that promote the use of ICT in all programs of study offered?

Qualitative content analysis is used. The findings are grouped into the following categories:

1. Scientific knowledge and study contents in the HOU.
2. Pedagogical practices used by HOU for the transmission of knowledge and use of ICT.
3. Use of ICT.
4. Training process evaluation.

This paper concludes with findings and results from this study.

Scientific Knowledge – Contents of study

Once HOU's constitution was formally ratified in 1995, planning for the university switched focus towards the general orientation of HOU, and the development of its specific academic programs of study. In meeting No.6/5-1-1996, a three member sub-committee was struck to make proposals for the preparation of a plan for HOU's academic development. The basic proposals of this sub-committee – i.e., the orientation of the studies reflecting the opinions of both the members of the administrative committee and of special scientists invited to its meetings – are summarized as follows:

a) HOU must address Greece's real and emerging educational and training needs. Specifically, HOU must supply graduate studies to school teachers, and offer undergraduate level courses in areas traditionally not offered by Greece's conventional universities (e.g., European culture studies and Hispanic language and civilisation studies). Emphasis was also placed on the development of graduate level courses in contemporary issues (e.g., Greek economic development; tourism and business administration; healthcare management; management of Greece's national healthcare system services; banking; cultural organizations management; and master in business administration).

b) Studies in innovative scientific and technological areas were also to be offered by HOU at a distance: i.e., graduate level courses in environmental design of cities and buildings; environmental design of infrastructure works; quality assurance; waste management; construction management; earthquake engineering and seismic-resistant structures.

c) It was deemed that course modules should meet criteria such as: supporting economic growth throughout Greece through the development and provision of a highly skilled workforce needed to support the Country's new labour markets; deliver courses that underpin Greece's social and cultural development; and supply courses that underscore Greece's international position worldwide.

d) In the first phase of development, priority was given to the education of teachers, executives of administration of the public or private sector, of small to medium-sized enterprises, and to social welfare and the local authorities. (Act 7/25-1-1996)

From these proposals, which were formally adopted by HOU's Administrative Committee (see Acts 9/7-3-1996, 14/11-9-1996, and 18/11-12-1996) it is concluded that HOU must aim to offer scientific knowledge oriented towards the needs of Greece's new labour market and towards sectors where social demand prevailed, such as in the training of highly skilled teachers at the graduate level.

How HOU can adapt its curricula to address the contemporary needs of Greek citizens is based on the choices its administrative committee places on each teaching module – i.e., as the basic functional unit of each program of study**.** A given module covers a given scientific area, either at the undergraduate or graduate level, and corresponds to approximately 3-4 semesters of study at a traditional university (Act 9/7-3-1996). When a module is no longer of interest or relevancy and should be sunset, or if a new module needs to be developed based on new and emerging educational needs, the chairman of HOU's administrative committee can invoke action that can keep HOU, fast, flexible and fluid, and wholly up-to-date on what is needed to support Greek students in their learning and, by logic, Greece in the global socio-economic community (Lykourgiotis, 1998).

HOU's administrative committee's first objective was to support the immanent provision of HOU's programs, starting in the school years 1998-1999. As such, foreign universities and their scientists were solicited for the development of suitable DE educational materials to be used by HOU. For example, an exploratory letter was sent to foreign universities experienced in developing and delivering DE learning materials. Several materials were evaluated and subsequently purchased to supply learning materials to HOU's graduate program, English language (Act 10/21-3-1996) from the University of Manchester (Act 18/11-12-1996). HOU's now established practice of purchasing from abroad, and translating and transporting turn-key packages of distance scientific knowledge, continued. Spanish Language and Literature (undergraduate) and The French Language (graduate) constitute typical examples of courses. It is the transference of re-contextualized scientific knowledge based on strict criteria of scientific validity and that regulates the power of borders, which reinforces specific cognitive objects (strong classification). It is the effect of the PECS of the empirical pedagogy about the use of ready-made packages of distance scientific knowledge (Lamnias, 2002b).

Most educational materials used by HOU are original, that is they are created by a team of experts. This team, for example, determined responsibilities and frames within which each team member operated. Members included: *a writer*, who wrote the material following particular specifications demanded by form and content; *an academic* responsible for each program (the academic also contributed to re-contextualization of distance pedagogical scientific knowledge via the re-drawing of plans); *a reader*, who 'fact checked' (along with the academic team member) the study texts for scientific quality; and, finally, *a DE expert* who ensured that all texts complied with the pedagogical principles needed to support effective DE delivery.

Construction of distance pedagogical scientific knowledge, within the creation of original educational material produced by HOU, reflects: a) strong classification of material based on strict specifications and the involvement of special scientists in the scientific area that ensure the scientific validity and reliability of HOU's learning materials, b) strong framing because the relationship and terms of collaboration are pre-determined and everyone works on specific, known, and irrefutable rules. In certain cases were the writers were unable to adapt their work to the specifications required, projects were cancelled.

In most undergraduate programs, and in 23 out of 24 graduate programs, the rules of succession are pre-determined precisely, and specific sequence of modules is obligatory. Consequently, there is a strong classification relating to the sequence of the modules that the student should attend to during their studies.

Pedagogical Practices

Teaching practices developed at HOU have been informed by internal regulation. Students must access relative information on their courses from HOU's main webpage. And to ensure they are in a position to advise, support, and direct HOU's students, teachers are obliged to know the organization and operation of courses and programs on offer by the University.

The pedagogical practices, as formulated in the HOU, with the criterions of the 'power of framing' and 'PECS' are now examined:

1. In the HOU, educational material packages consist of: books, cassettes, videos, CD-Rom, and educational software supported through the use of ICT (Act 1/7-11-1995). The creation of an electronic bank of educational material (i.e., learning objects) is currently under consideration (Act 18/11-12-1996).

2. Modules are accompanied by detailed timetables of study and students deliverables in the form of written work and tests (HOU, 2002). Thus, the following are determined:

    - Lock-step sequencing of DE contents provides students a timeline for learning and knowledge acquisition. Students are also given instructions on the applicability of additional learning materials available to them to help them master the subject material on a deeper level (i.e., additional texts, books, and audiovisual materials that are not part of the course per say, but are nonetheless helpful).

    - HOU students learn in a paced environment. HOU's academic year is divided to 32 weeks, beginning the first week of October. Students are made aware of the time they need to spend to study of each chapter (e.g., one or two weeks) and of deadlines and timelines they must meet in handing in their written work and assignments.

3. By regulating all facets of students' studies, evaluative criteria are determined. That is, the questions concerning the rights and obligations of teachers and students in sub-areas such as 'communication' are defined. For example, teachers must be available for student consultations during specific times; moreover, all comments on all written assignments must be returned to students within 15 days of receipt. In terms of quality assurance, HOU evaluates its teachers via a student questionnaire that asks pointed questions as to whether or not teachers failed, met, or exceeded students' expectations on basic criteria such as timeliness, accessibility, and instructional efficacy.

HOU uses a comprehensive regulatory framework to support its students. As such, strong framing exists concerning 'relationships' cultivated inside the institution itself. Indeed, HOU is uses clearly defined hierarchical relations of power on two levels:

a). First, HOU's administrative committee decides the general policy of the institution. The chairman plays a central role in providing direction and guidance to the administrative committee. For example, A. Lykourgiotis, the first chairman of the administrative committee, when taking into consideration the opinions of committee, formally articulated HOU's educative and organizational features (Koustourakis, 2006). This shows strong framing in the rule sequencing/ pacing and criteria and in the regulative rules between academic personnel, tutors, and HOU's administrative committee. In Table 1, the characteristics of the instructive practices related with framing and the adopted PECS.

b). The second level concerns the operation of HOU's various programs and modules. In this case, HOU's program directors and module coordinators coordinate and supervise how established instructional policies will guide HOU's various programs and study modules. Sub-committee teams comprised of instructional personnel (i.e., teachers and tutors) working on specific modules, participate in this process. At first glance, this appears to show relatively weak framing in terms of communication among the teachers/ tutors. The coordinator of each module, however, is typically a member of the HOU's academic personnel, and their decision is central in that this person determines and directs daily the work flow of the overall team that must deal with HOU's day-to-day procedural affairs, such as the formulation and/ or choice of subjects on offer, pedagogical approaches that should be best taken, and the development and administration of final written examinations.

Hierarchical relationships and divisions of power are clearly evident in that the tutors do not participate, and are not represented, on any of HOU's institutional committees. This means that tutors' contribution to the formation of policy at the institutional level is virtually non existent. Moreover, the tutors' job performance is evaluated by module coordinators, who, in turn, are responsible for evaluating their terms of employment and the renewal of their HOU contract.

Table 1. Pedagogical Practices: Framming and PECS

	Framing*	***PECS***
Instructional Discourse:		
Sequence	F+	Empirical
Pace	F+	Pedagogy
Evaluation criteria	F+	
Regulative Discourse:		
Relations between Academic Personnel, Tutors & Administrative Committee of the HOU	F+	Empirical Pedagogy
Relations between Tutors in the same Module	F-	Interpretative pedagogy
Relations between Tutors and Students	F-	

*F+: Strong Framing, F-: Weak Framing.

From Table 1 on the previous page, we can see that:

- Among tutors belonging to the same module, the framing is weak. According to HOU's internal regulation, tutors, being equivalent, only collaborate on instructional teams, to which they belong and only vicariously co-shaping its decisions.

- Hierarchical relations between teachers-students framing is similarly weak, for two reasons:

  1) Tutors, apart from their role as teacher, also advise, encourage, and support students (Vergidis & Panagiotakopoulos, 2002).

  2) In 2001-2002, students formally evaluated their tutors' performance; this formal evaluation was weighted at 65 percent of each tutor's final assessment. Given this weighting, the outcome of students' assessment is clearly central in determining whether or not a given tutor will be re-hired by HOU. Tutor's ranking for a particular module also determines the choice of the city in which they reside – or where they must move during the academic year. Indeed, living in the right city enables many tutors to participate in the right teams. Moreover, tutors' performance is evaluated by a three-member student committee, a fact that gives additional prestige and power to students' influences over tutors, and arguably, the attitude and behavior of many tutors towards them. For example, tutors may find it politically prudent to display a friendlier attitude towards students (and perhaps more favorable/ lenient marking and grading outcomes?)

- HOU's pedagogical approach, however, is student centered because:

  a) The DE study materials used are essentially designed to be self-educating learning material. Students must learn how to learn at a distance and a such, they must be empowered over their learning outcomes.

  b) Because knowledge acquisition is a student-centered activity at HOU, this principle is also reflected in the planning of various group projects. In group projects, there is no teaching per say. On the contrary, in group projects students employ knowledge already gained from self-study. To facilitate these group sessions, tutors employ various pedagogical techniques and approaches (i.e., work groups, discussions, acting, practice) designed to motivate students into action in such as way so that they can process and comprehend the subjects under discussion.

In sum, HOU's pedagogical practice shows that the principles from the PECS of interpretative pedagogy have been adopted, and thus makes HOU's students the epicenter of the learning process.

The Use of ICT in the Practice of Educational Work

Over the last few years, the increased use of ICT, and especially the Internet and the World Wide Web, have offered a suitable framework for more advanced, effective, and technologically fulfilled environment for distance learning (Horton, 2000; Clark & Mayer, 2002).

HOU policy demands that teachers must use ICT. Moreover, because of their nature, there are programs that compel students to use ICT. Teachers and tutors are required to respond inquiries, such as email, in a timely manner. Teachers must also possess the skills, knowledge, and capacity to use personal computers for instructive purposes (e.g., laboratories and tutorials), which are provided either by the instructor or HOU.

Ideally, students' computer skills should also be solid, so they can engage in all facets of university life at HOU, such as registering for courses, researching and accessing online learning materials, accessing library resources, interacting in online courses and discussion groups, and communicating with HOU's secretariat on various organizational and procedural matters. And while students are not obligated to use the Internet, it is handy and, frankly, tends to be necessary. Hence, HOU website has been designed as a centralized repository housing a wealth of additional online educational materials (e.g., study guides) that support many learning modules offered by HOU. As a consequence, the use of ICT at HOU is becoming more central, and it will likely be essential in the future.

Table 2. Internet usage in Greece 2000, 2006 (Source Internet World Stats, 2006).

Years	Internet Users	Population	Users per Population %
2000	1,000,000	10,964,019	9.1 %
2006	3,800,000	11,338,624	33.5 %

Despite the growing need for HOU students to use the University's Internet-based resources, as shown in Table 2, Internet penetration remains low in Greece, primarily due to high cost of access. According to data from 2006, 36.9 percent of Greeks using the Internet connect through their workplace (Stamati, 2006). This means there is a significant digital divide between Greece and so called "advanced" countries. According to Perrin and Mayhew (2000), at the turn of the new millennium approximately 70 percent of the certified four year colleges in the United States offered courses via Internet, in addition to traditional face-to-face delivery modes. This can be compared to Greece, where low penetration and use of ICT is also reflected in the adoption rates of the ICT by HOU for educational use, which is also comparatively low compared to other DE institutions worldwide (Panagiotakopoulos, Lionarakis & Xenos, 2003).

In terms of educational packages offered by HOU's programs, however, *educational software* used as an alternative mode of delivery – in addition to printed materials – remains nearly non-existent. Nonetheless, HOU has been using ICT for its administrative processes; its Web portal interfaces with tutors, students, and even potential students. HOU's current ICT model used mostly houses audiovisual and print-based materials.

Evaluation of the Learning Process

Table 3 shows the results of the training process evaluation, which are framed and have adopted PECS. At HOU, as is also the case with the British Open University, heavy emphasis is placed on students' written work. Students must demonstrate that they comprehend the materials, and that they can apply what they have learned precisely and creatively. This formative evaluation is influenced by PECS's interpretative pedagogy,

which connects student's self-learning activities to cognitive subjects and ultimately the progressive conquest of the learning materials.

Table 3. Process of evaluation, framing and PECS

Forms of evaluation	*Framing**	*PECS*
Formative evaluation via written work	F+	Interpretative Pedagogy
Final evaluation via the final written examinations	F+	Empirical Pedagogy

**F+: Strong Framing*

Student acquisition of HOU's learning materials and modules is paced (strong framing). This means students must hand in assignments on time. Similarly, tutors must mark all student assignments and submit the grades to the students and HOU's secretariat in a proscribed period of time.

Students must meet a minimum grade point standing in order to qualify for the final exams. As each component of the course module is typically weighted at 30 percent, this ensures students are adequately prepared to meet the rigors of the final examination. Indeed, as is the case in traditional universities, HOU also places strong emphasis on students' mastery of its final exams. Thus PECS is strongly framed, because students' final exams results demonstrate not only mastery of module parts, but of the entire course. This process is not draconian, however. If a student fails, they are welcome to repeat the course in the next academic year. For graduate students, however, non-completion of a particular course within two academic years automatically leads to their expulsion from the graduate degree program. Consequently, the HOU as an "open" institution closes permanently for non performing students studying at the graduate level.

Conclusions

The Hellenic Open University is a higher educational distance learning institution that has been working to incorporate ICT into its administrative and learning processes. To this end, HOU has been proactively developing its ICT capacity. Educational practices, aimed at supporting students and their learning processes, have been developed – and will continue to be developed – using the latest technological advancements.

From the data examining HOU's pedagogical practices, we note:

Content of Knowledge

Prefabricated "learning objects", mostly produced in Greece by the HOU, are made available to students. Imported learning objects, on the other hand, are typically pedagogically re-contextualized to ensure high scientific validity and rigor that remains relevant to the Greek context and language. The learning objects developed, used and deployed by HOU, show strong framing in HOU's various modules (PECS data of empirical pedagogy).

Pedagogical Practices

There exists on the one hand, strict hierarchical relationships (strong framing) between HOU's academic personnel and tutors. This framing is evident by the HOU's evaluation process of its tutors, typically by its academic personnel, who, in turn, act as course module coordinators and/ or are responsible for each program of study (PECS data of empirical pedagogy). On the other hand, hierarchical relations are blurred between teacher-student, as the teacher acts in mainly an advisory, encouraging role (student centered learning) with the students (weak framing). In this context, the tutor appears as a teachers to students, as they are the ones who supports and leads students in their own individualised process of learning. The educational materials used demand that students learn on their own, with the support of a tutor. This means that teaching is based on individualized pedagogical principles of DE for adult learners (PECS data of interpretative pedagogy). In this context, ICT does contribute.

Evaluation

Pedagogical emphasis is placed on student-centered learning (PECS data of interpretative pedagogy). Formal student evaluation emphasizes the final exam results (PECS data of empirical pedagogy) that evaluates and formally measures students' knowledge and skills acquisition on all modules of the course.

As noted earlier, HOU was established as a single mode DE university catering to adult learners in 1995. When HOU was established, however, power and social control (i.e., the political landscape) in Greece informed the pedagogical choices that currently underpins and informs the direction of HOU. Such issues of political power and social control are explicit in the fact that HOU is generally not accepted as being "legitimate" in the eyes of the established Greek academic community, even though HOU has been formally legalized by the Greek Government. For example, from 1997 until 2003, the Council of Rectors of the Greek universities refused the participation of the Chairman of the Administrative Committee of the HOU in its work. Perhaps Greece's larger and more entrenched traditional academic community is concerned about competition? Or perhaps even the legitimacy of DE as a sound pedagogy? Such concerns are unwarranted, however. Not only does research show that DE offers certain students a sound pedagogical alternative (Shachar & Neumann, 2004), HOU's tutors and academic community are also members of Greece's traditional university community. Moreover, the course writers hired by HOU to write its course and learning materials also work as course writers at traditional universities. Clearly these working ties to Greece's traditional university system has influenced the formation and the operational framework of HOU, which in turn, has informed its more general institutional and organizational choices. HOU, like traditional universities, ensures that students must pass a rigorous final evaluation. To a large extent, however, HOU's formal and informal ties to traditional epistemological modes and institutions, also limits it "being open". Thus, HOU, as an institution providing distance study, could face controversy concerning the level and quality of its studies – a stage, incidentally, that the open universities operating in other countries also passed in their first stages (Keegan, 1996).

Comparing the educational practices between HOU and conventional Greek universities, however, is like comparing apples to oranges. While traditional universities operate in a teacher-centered "sage on the lecture stage" context, HOU students are placed at the epicenter of HOU's educational process. HOU students must learn how to learn at a distance. Clearly, this demands more flexible practices on the part of HOU in terms of providing student support, from writing student-centered educational materials designed to meet the needs of adult learners learning at a

distance, to the level and dynamics of online communication between students and tutors, to the support of student-centered learning, to the deployment of Group Advisory Meetings, and most importantly motivating students to cognitively process and synthesize and learn the course materials by themselves with only a tutor there as a "guide on the side" to help them succeed in their learning journey. In the last case, elements of interpretative epistemology enter the HOU, which is aimed at making the institution friendly and accessible to its students by supporting and encouraging their self-driven effort for education and training.

The majority of HOU's students are busy adults juggling family and work responsibilities, while studying part time. HOU's role of the tutor, which is based on the British Open University exemplar, currently shows weak framing in terms of students-tutor relationships. This is why the development and deployment of ICT is helpful for the success of HOU's students. Such technologies not only help build working relationships between tutors and students, but also help students to help themselves to the panoply of online resources and educational materials that can help them learn at a distance.

Unfortunately, HOU currently lags behind many other open and distance education institutions in the world, specifically in terms of incorporating and using ICT to support and aid students in their learning. The lack of suitable online educational (digital) materials, coupled with the reality that computer and Internet usage in Greece – primarily due to high cost of access – remains low, means that HOU faces significant challenges in terms of supporting students using ICT. The good news, however, is that this is slowly changing, as reflected in the high-level use of ICT by the HOU for administrative purposes.

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Perceptions of Social Loafing in Online Learning Groups: A study of Public University and U.S. Naval War College students

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Abstract

Social loafing research has spanned several decades and fields of study. Research has provided support for both the existence of social loafing and its antecedents within the laboratory, classroom, and work place. Studies regarding the perceptions of social loafing and its effects in the online learning environment, however, are largely non-existent. This study surveyed 227 online learning students who were participating in online learning groups. The study seeks to determine whether the perception of social loafing exists within online learning groups. In addition, several psychosocial factors identified in face-to-face environments are analyzed to determine their impact in online learning groups. Evidence supports both the perception of social loafing in online learning groups as well as similarities between social loafing antecedents in face-to-face groups and those in the online learning environment.

Keywords: Social loafing; free riding; task visibility; contribution; distributive justice; procedural justice; dominance; sucker effect; sucker role; online learning

Introduction

Virtual groups are becoming a common component of both the corporate and educational structure. Social organizations, corporations, and government associations are increasingly turning to virtual groups to bridge the gap between face-to-face interactions and difficulties associated with temporal and geographical separation (Bradner, 2003). Proponents of group work purport that students can participate in the active construction of knowledge, enhance problem solving skills, share ideas and opinions, gain valuable experience (Haythornthwaite, 2006), and learn valuable lessons regarding group communication and problem solving that are easily transferable to the work environment (Becker & Dwyer, 1998; Black, 2002).

As the demand for online learning has expanded in recent years, technology and course design advances have allowed educators to incorporate many of the best face-to-face course practices

into the online environment. Research suggests that teamwork in combination with asynchronous learning networks (ALN) may significantly increase learning perceptions, problem solving skills, and help students achieve a higher level of learning than individual learning (Hiltz, Coppola, Rotter & Turoff, 1999). Computer mediated communication (CMC) provides the ability to collaborate, exchange ideas, solve problems, share experiences, opinions and resources (Hiltz, 1998; McConnell, 2000; Stacey, 1999; Collins & Berge, 1996).

Although online education holds the promise of exciting and unique opportunities for learning, these opportunities do not come without challenges. Distance learning literature has indicated the existence of both social and individual difficulties associated with the online environment (Ragoonaden & Bordeleau, 2000; Curtis, 2001; Ardichvili, Page & Wentling, 2003; Forrest & Miller, 2003; Naquin & Tynan, 2003; Allen & Hecht, 2004; Paulus & Van der Zee, 2004; Gillespie, Rosamond & Thomas, 2006). Although distance education courses are increasingly incorporating various versions of cooperative and collaborative learning exercises, these group activities do not always meet with great student appeal or result in the higher learning expectations of the designers (Mason, 1998). Group work requires increased time and dependence on others which is often in direct conflict with student perceptions of distance education and online learning. In fact, group work presents a set of problems for students that include, but are not limited to, non-contributing group members, unequal workload, scheduling, and personal/ social conflicts between group members (Becker & Dwyer, 1998).

Review of Literature

Although initial efforts to incorporate group work into distance education primarily utilized threaded discussion boards, recent instructional design and technology improvements now make intricate group projects more plausible. As online group interactions become more complex, however, so does the intricacy of group interactions and their associated difficulties. Common group work problems may include poor communication, task allocation (Steiner, 1972), distribution of resources, decision making (Janis, 1982), motivation (Parks & Sanna, 1999), productivity (Allport, 1924; Zajonc, 1966), process loss (Steiner, 1972), and individual behaviors that include shirking, lurking (Palloff & Pratt, 2003; Salmon, Giles & Allen, 1997; Rovai, 2000; Nonnecke & Preece, 1999; Nonnecke & Preece, 2003; Schlosser, 2005), dominance, aggression (Michaelsen, Fink & Knight, 1997), social loafing (Moede, 1927; Dashiell, 1930; Kravitz & Martin, 1986), and free riding (Albanese & Van Fleet, 1985; Jones, 1984).

Social Loafing

Social loafing is the tendency to reduce individual effort when working in groups compared to the individual effort expended when working alone (Williams & Karau, 1991). At the opposite end of the spectrum from social loafing is social facilitation. Social facilitation is the concept that people often perform better in the presence of others than alone (Cook, 2001). This history of social loafing can be traced back to the work of Max Ringelmann in 1913. Ringelmann was a French agricultural engineer interested in determining the efficiency of animals, men, and machines in various agricultural applications (Kravitz & Martin, 1986). During experiments he conducted with his students and a group of prisoners, Ringelmann observed an inverse relationship between the size of the team and the effort expended. Subsequently, this relationship is coined the *Ringelmann Effect*.

In his 1913 publication, Ringelmann described several experiments (Kravitz & Martin, 1986). In a rope pulling experiment, Ringelmann noted that as the number of group members was

increased, there was a decrease in overall performance. In another experiment where prisoners provided motive power for a flourmill, he reported that as more men were added, each man began to rely on his neighbor to furnish the desired effort. Some prisoners became content to let their hand follow the crank and some went as far as letting the crank pull their hand. Although Ringelmann attributed the reduction in effort to motivational loss, his primary interest was examining process loss. It was many years before there was a renewed interest in Ringelmann's research. In fact, the term social loafing, to describe the concept of reducing one's work in groups compared to working alone, did not exist until 1979 when Latane, Williams, and Harkins (1979) first coined it.

Extensive research is available on the phenomenon of social loafing in the laboratory, face-to-face classroom, and the workplace. Research regarding social loafing in the online environment, however, is relatively sparse. Antecedents to social loafing identified in the face-to-face literature such as task visibility, individual contribution, and dominance become more difficult to control in the online learning environment. In addition, distance learning issues such as geographical separation, lack of visual cues, work schedules, and time zone differences may also exacerbate perceptions of social loafing in online learning groups.

Although it may be tempting to assume that social loafing perceptions exist in online learning based on the classroom evidence and complicating factors of the online learning environment, researchers must resist the urge to make this leap without first confirming its existence via constructive research. This study seeks to increase the understanding of social loafing in the online learning group by first determining whether the perception of social loafing and its antecedents exist in the minds of students participating in the online learning environment.

Social Loafing Research: This study

Personal Degree of Social Loafing

Perceived social loafing refers to the extent that group members believe that other group members are engaging in social loafing (Comer, 1995). It is important to note that each group member can only perceive what other group members are doing for project contribution. One member may struggle with the assigned concept, spend many hours of individual effort, actually learn a great deal and yet contribute less than others to the group output. This is especially true when the members do the assigned project work outside a face-to-face setting. Research concludes that group members will base their actions on the *perceived* actions of their fellow group members whether or not they are actually occurring (Mulvey & Klein, 1998). The mere perception of social loafing, whether accurate or not, may result in negative effects on group members' motivation and result in social loafing (Mulvey & Klein, 1998). Real group work and learning may therefore occur, but members of the group perceive unequal effort. Once members of a group perceive that some group members may be either taking over the project or stepping back from the project, it may affect their personal contributions. The act of group members carrying a free rider or social loafer has been termed playing the *sucker role*. Avoiding playing the sucker role by reducing one's individual effort has been termed the *sucker effect* (Kerr, 1983). Although research asserts a strong perception of social loafing in the classroom, laboratory, and work place (Karau & Williams, 1993; Hardy & Latane, 1986; Williams, Harkins & Latane, 1981; Comer, 1995), there has been little research on the perception of social loafing in the online learning environment. Prior to investigating the impact of social loafing in the distributive learning environment, it becomes imperative to determine whether the perception of social loafing actually exists in online students. In order to study this, the following Hypothesis was established and tested.

Hypothesis 1: The perception of social loafing exists within online learning groups.

Individual Task Visibility

Kidwell and Bennett (1993) have defined *task visibility* as the belief that a supervisor is observing one's individual efforts. Increased task interdependence in group work decreases task visibility due to increased difficulty in monitoring individual contributions of group members (Jones, 1984). When individual contributions are indistinguishable from the collective, individuals are no longer able to demonstrate their personal contributions and claim the benefits associated with these contributions (Jones, 1984). In addition, high contributing individuals may be working in groups with individuals who are not contributing adequately to the group effort but not suffering consequences. For the students who participate fully, this could result in feelings of inequity and lead to social loafing.

Conversely, those not fully contributing may social loaf because they perceive that their work is not critical for the group project's overall success (Karau & Williams, 1993), perceive an inequitable relationship (Walster, Berscheid & Walster, 1973), believe benefits outweigh the cost (Murphy, Wayne, Liden & Erdogen, 2003), or are intentionally free riding. *Free riding* occurs when an individual does not bear a proportional amount of the work and yet shares the benefits of the group (Albanese & Van Fleet, 1985; Jones, 1984). To test and see if task visibility effects social loafing in the online setting the following hypothesis was developed and tested.

Hypothesis 2: Perception of decreased individual task visibility increases the occurrence of perceived social loafing among group members.

Distributive Justice

Distributive justice is an individual's perception of the distribution of rewards or compensation among group members (Liden, Wayne, Jaworski & Bennett, 2004). The perceived fairness of the procedures and policies used to make decisions is termed *procedural justice* (Greenberg, 1990). Individual task achievement, when participating in group activities, can be influenced by a student's perception of the procedural and distributive justice established by administration or an instructor. Kidwell and Bennett (1993) proposed that an individual might alter their individual work effort if there is a perception of unfair distribution of rewards. Research indicates there is a significant correlation between procedural justice and social loafing; and individual's perception of the fairness in distribution procedures may influence the individual's effort on group projects (Liden et al., 2004; Karau & Williams, 1993). There is a large body of research on equity theory in support of these assumptions (Leventhal, Weiss & Long, 1969; Adams & Rosenbaum, 1962; Cook & Hegtvedt, 1983). Equity theory proposes that individuals will continually seek equitable relationships. If an individual discovers that a particular situation is inequitable, they will experience stress. Individuals will attempt to alleviate this stress by attempting to restore equity to the relationship. Research suggests that individuals may seek to restore the actual equity, or if unable, will seek to restore psychological equity (Walster, Berscheid & Walster, 1973). The individual may attempt to restore actual equity by reducing or increasing inputs, raising individual outcomes, or even by more manipulative means such as theft or sabotage. Individuals may attempt to restore psychological equity by denigrating the position of the other individual or

distorting the perception of individual inputs/ outputs. Negative aspects of this behavior can appear as negative comments/ opinions of others and justification of poor opinions and treatment (Walster, Berscheid & Walster, 1973). Hypothesis 3 examines whether perceptions of distributive justice contributed to online social loafing.

> Hypothesis 3: There is negative correlation between positive perceptions of distributive justice and social loafing in online learning groups.

Dominance, Aggression, and Individual Contributions

In any group project, personalities of participants should be part of the design considerations. Without any restrictions in project design, it can be expected that stronger personality types will naturally move into positions where they are most comfortable. Problems exist when any individual inappropriately uses their position, status, or strong personality to dominate, intimidate, or harass fellow group members. The dynamics of this behavior on more reserved members can be a decrease in participation due to a feeling of intimidation (Michaelsen, Fink & Knight, 1997). Palloff and Pratt (2003) suggest that rude or angry personal attacks on a classmate can have a negative influence on group dynamics in that the students report feeling unsafe, insecure, and inhibited in expressing their personal feelings and beliefs. One may believe that this kind of behavior would be far less prevalent in online classes than in face-to-face settings. Part of this perception may come from the fact that the group participants are not in direct contact with each other and therefore are not subject to physical attitudes that would support dominance attempts. Alternatively, this spatial separation may encourage some class members to engage freely in personal attacks or to seek dominant positions on the team.

Karau and Williams (1993) suggest that individuals will be unlikely to exert extraordinary effort unless they view their individual task within the group project as meaningful. When dividing the project into pieces identifying and assigning an easy task to a student will likely prejudice the student into believing that full effort is not required. Individuals will often withhold effort, seek to achieve personal rewards, and calculate ways to maximize benefits as long as they perceive that doing so will not affect their outcomes (Liden et al., 2004). Reducing a student's contribution to an unidentifiable piece of a project will negatively affect the desire of that contributor to do their best. If the individual effort becomes highly integrated into the group effort and rewards allocated accordingly, motivation may also suffer (Lawler, 1971). Dominant group members can manipulate an individual's perception of unique group contributions, intimidate them into believing their contributions are not necessary, and negatively influence their desire to contribute to the group project.

> Hypothesis 4: There is a negative correlation between individual contribution and dominance in online learning groups.

> Hypothesis 5: There is a positive correlation between self-reported social loafing and dominance in online learning groups.

Method

Participants

The participants were 227 (n = 174 male, n = 53 female) undergraduate and graduate students enrolled in online courses at either a major university in the southeast United States or in one of the U.S. Naval War College web-enabled courses. Participant ages ranged between 20 and 55 years of age (ages 20 to 30 = 44; ages 30 to 40 = 74; over age 40 = 106; 3 did not report their age).

Procedure

All participants were enrolled in an online course where they took part in a group project as part of the course. Since group projects were required for the online courses and served as the task examined, there is no constancy in project nature. Groups were naturally occurring and group size ranged from two to nine members. The complexity of the group assignment also varied across the courses. Each group had complete autonomy regarding individual and group goals, team member assignments, and group roles. Several courses required more than one group project within the course, but each participant completed their survey based upon their most recent group project. At the conclusion of their group project, each group member was asked to complete a Web-based survey to report their perceptions of: (a) degree to which their fellow group members participated in social loafing; (b) personal degree of social loafing; (c) individual task visibility; (d) individual contribution; (e) distributive justice; (f) sucker effect; and (g) group member dominance.

The Web-based survey consisted of 43 items and allowed for students to start and stop the survey at will while storing their results. Students had the option to complete the survey at more than one opportunity to encourage a higher completion rate. If participants had completed the survey at a prior time and attempted to complete a new survey, they would receive an electronic notification that they had previously completed the survey and the survey could not be completed a second time. Students who had not completed the survey at the end of their group projects were encouraged to do so at the end of the course.

Variables

Perceived group member loafing

This measure assesses the group member's perception of loafing in groups. Ten items adapted from George (1992) were used to assess perceived group member loafing. The scale asked participants to indicate their perception of how many of their group members possessed the characteristics listed in the ten items. Example items include, "Took it easy and let other students do the work" and "Did not do his or her fair share of the work."

Perceived individual loafing

This measure assesses the group members' personal perception of their own social loafing. The scale asked participants to indicate their agreement with ten statements about their personal behavior using a five-point Likert scale. Items were scaled 1 = strongly agree to 5 = strongly disagree, and were summed to form a composite (α = .96). These ten statements were adapted from George (1992). Example items include, "Did not do your fair share of the work" and "Left work for other group members that you should have completed."

Task visibility

This measure assesses the group member's perception of individual task visibility throughout the assignment. Group members were asked to indicate their agreement with six statements regarding task visibility using a five-point Likert scale. Items were scaled 1 = strongly agree to 5 = strongly disagree, and were summed to form a composite (α = .83). These six statements were adapted from George (1992). Example items include, "My instructor was aware of the amount of work I do" and "My instructor was generally aware of when a student was putting forth below average effort."

Contribution

This measure assesses the group member's perception of individual contributions to the group. Group members were asked to indicate their agreement with three statements regarding individual contributions using a five-point Likert scale. Items were scaled 1 = strongly agree to 5 = strongly disagree, and were summed to form a composite (α = .83). These three statements were adapted from George (1992). Example items include, "I think that I made a unique contribution to the success of our group" and "The success of the project hinged on students like myself."

Distributive justice

This measure assesses the group member's perception of distributive justice. Group members were asked to indicate their agreement with three statements regarding the fair distribution of rewards or compensation using a five-point Likert. Items were scaled 1 = strongly agree to 5 = strongly disagree, and were summed to form a composite (α = .83). These statements were adapted from Welbourne, Balkin and Gomez-Mejia (1995). Example items include, "My instructor was fair in rewarding my work considering the amount of effort I put into the work" and "Grades for individual group members were fair based on individual contributions."

Sucker effect

This measure assesses the group member's decrease in individual contributions in response to the perception of another member's decreased contributions. Group members were asked to indicate their agreement with four statements regarding individual participation in the sucker effect using a five-point Likert scale. Items were scaled 1 = strongly agree to 5 = strongly disagree, and were summed to form a composite (α = .79). These statements were adapted from Mulvey and Klein (1998). Example items include, "Because other group members were not contributing as much as they could, I did not try my best on the project" and "Was less likely to volunteer for tasks if another student was available to complete the task."

Dominance

This measure assesses the group member's perception of group member dominant behavior. Group members indicated their agreement with three statements regarding individual perception of group member dominance using a five-point Likert scale. Items were scaled 1 = strongly agree to 5 = strongly disagree, and were summed to form a composite (α = .76). Example items include, "When my group had an assertive/ dominant group member, I was more likely to put less effort into the group work" and "Assertive/ dominant group members intimidate me and cause me to defer tasks (for which I was responsible) to other group members."

Results

Descriptive statistics and correlations appear in Table 1 and 2 respectively. Of the 227 participants, 3.7 percent self-reported social loafing in groups. Only 2.1 percent of NWC (Naval War College) students self-reported social loafing, while 8.3 percent of the public university students self-reported social loafing. Self-reports of social loafing indicate that these individuals admitted to personally engaging in social loafing during their group activities. Of the 227 participants, 35.7 percent indicated the perception of other group members engaging in social loafing. Of the public university students, 77.4 percent reported the perception of other group members loafing, while only 8 percent of the NWC students reported the perception of others loafing.

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
TaskVisibility	195	7	34	23.80	4.793
Contributions	221	6	15	10.83	2.042
SocLoafOthers	226	0	90	6.31	13.614
SocLoafSelf	191	9	36	16.73	6.909
SuckerEffect	193	7	15	10.16	1.571
Dominance	192	3	11	6.84	2.229
DistJustice	195	3	15	11.37	2.201
Valid N (listwise)	180				

Table 2. Correlations

	Task Visibility	Contributions	Social Loafing Others	Social Loafing Self	Sucker Effect	Dominance
Task Visibility						
Contributions	.080					
Social Loafing Others	-.125	.121				
Social Loafing Self	-.076	-.287(**)	.009			
Sucker Effect	-.173(*)	-.133	.150(*)	.786(**)		
Dominance	-.101	-.219(**)	.077	.500(**)	.609(**)	
Dist Justice	.434(**)	-.029	-.179(*)	-.262(**)	-.273(**)	-.145(*)

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Hypothesis 1: The perception of social loafing exists within online learning groups. Although a low percentage of NWC students perceived social loafing in their groups, 77.4 percent of public university students perceived social loafing. Since research suggests that the mere perception of social loafing within a group may decrease motivation and lead to others loafing (Mulvey &

Klein, 1998), even the smallest percentage of social loafing perception is reason for concern. The percentage of individuals perceiving social loafing in their online learning group therefore supports Hypothesis 1.

Hypothesis 2: Perception of decreased individual task visibility increases the occurrence of perceived social loafing among group members. No correlation was found between task visibility and perceived social loafing. As indicated in Table 1, however, a negative correlation ($r = -.173$, $N = 191$, $p < .05$) was found between task visibility and sucker effect. In addition, a positive correlation ($r = .434$, $N = 192$, $p < .01$) was found between task visibility and distributive justice. Although no evidence was found to support Hypothesis 2, there is evidence to suggest that as task visibility increases, avoidance of playing the sucker role will decrease. It also suggests that as task visibility increases, so does the perception of the fair and equitable distribution of awards.

Hypothesis 3: There is negative correlation between positive perceptions of distributive justice and social loafing in online learning groups. A negative correlation ($r = -.262$, $N = 188$, $p < .01$) is demonstrated between distributive justice and self-reported social loafing. There is also a negative correlation ($r = -.179$, $N = 194$, $p < .05$) between distributive justice and social loafing of others. These correlations suggest that as positive perceptions of distributive justice increase, social loafing decreases.

Hypothesis 4: There is a negative correlation between individual contribution and dominance in online learning groups. Table 1 indicates there is a negative correlation ($r = -.219$, $N = 191$, $p < .01$) between contribution and dominance. This suggests that as perceptions of dominance increase, individual contributions decrease.

Hypothesis 5: There is a positive correlation between self-reported social loafing and dominance in online learning groups. Table 1 indicates a positive correlation ($r = .500$, $N = 186$, $p < .01$) between self-reported social loafing and dominance. This suggests that social loafing increases with the perception of group member's display of dominant behaviors within the group. These data support Hypothesis 5. A positive correlation was also found between dominance and sucker effect ($r = .609$, $N = 190$, $p < .01$). This suggests that as the perception of dominance increases within the group, members will increase their efforts to avoid playing the sucker role by reducing or withholding effort.

Table 1 also indicates a significant correlation ($r = .786$, $N = 188$, $p < .01$) between sucker effect and self-reported social loafing. These data suggest that as the perception of social loafing increases, so does the tendency of individuals to avoid playing the sucker role by reducing their individual effort.

Discussion

Hypothesis 1

Hypothesis 1 proposes that the perception of social loafing exists within online learning groups. Determining whether this perception exists was the primary purpose of this research. Of the 227 survey participants, 35.7 percent indicated a perception that other members of their group were social loafing. Approximately 8 percent of the Naval War College students and 77.4 percent of the public university students perceived the existence of social loafing within their online learning groups. Self-reported social loafing percentages were much lower for both groups. The Naval

War College students self-reported only 2.1 percent social loafing, while the public university students self-reported 8.3 percent. The lower percentage of self-reported social loafing is consistent with prior research. Karau and Williams (1993) propose that individuals may be unaware that they are social loafing or reluctant to admit that they have participated in social loafing.

The difference between the Naval War College students and the public university students was a surprising result that prompts further examination. Possible research questions should include whether differences in group size, group composition, and group assignment can account for the differences between these groups. Initial investigation does not indicate any significant differences between any of these issues that can account for the differences in group reporting. The Naval War College description of group work was consistent with assignments in the public sector.

Naval War College students participate in several group projects during their Web-enabled class time. One project divides the students into pairs and the pair examines a reading assigned by the professor. By exchanging papers with each other, the team determines to either support or refute the original author's position on an issue. In another project, a group of students (usually 4 to 6 in size) conducts a live chat session with the course professor where they attempt a critical analysis of a geo-political issue presented by the professor at the start of the session. In a third project, the teams are assigned a scenario and must work together to select future weapon systems that would be advantageous in this hypothetical conflict, and then explain the rationale of why the chosen systems would be the preferred options.

The public university students also participated in several group projects during the semester. The students participated in groups that ranged in size from two to five members. Members participated in online activities that included group presentations, paper reviews, computer projects, and instructional design projects. Unlike their Naval War College colleagues, the public sector students participated solely in asynchronous online sessions. Based on these descriptions, there was no evidence to suggest that differences between group assignments account for the difference in social loafing reporting. Future research, however, should seek to examine other possible differences between military students and their civilian counterparts.

Hypothesis 2

There is no evidence to suggest support for Hypothesis 2. Hypothesis 2 proposes that the perception of decreased individual task visibility increases the occurrence of perceived social loafing among group members. There was no significant correlation between either self-reported or perceived social loafing in others. The lack of correlation between self-reported loafing and task visibility may not be surprising considering the low expectation in the literature for individuals to self-report. The lack of correlation between perceived loafing of others and task visibility, however, is in conflict with prior research (Liden et al., 2004) and warrants further investigation.

Hypothesis 3

Hypothesis 3 proposes there is negative correlation between positive perceptions of distributive justice and social loafing in online learning groups. Table 1 displays the confirmation of a negative correlation. The result supports prior research (Liden et al., 2004) and suggests that as positive perceptions of reward distributions among individual members increase, the occurrence

of social loafing decreases. Ensuring that group members understand the procedures behind and the distribution of rewards can therefore have a definitive influence on group performance. If group members either misunderstand or perceive any injustice in the distribution of rewards, members may engage in social loafing in order to more equitably distribute the rewards among group members.

Hypothesis 4

Hypothesis 4 proposes a negative correlation between individual contribution and dominance in online learning groups. This hypothesis was supported. There is little research thus far on the effect of dominance on individual contributions within the group context. The research that has been conducted in this area, however, suggest that aggression and dominance in the group context may result in participants feeling intimidated (Michaelsen, Fink & Knight, 1997), unsafe, insecure, and inhibited (Palloff & Pratt, 2003). The Naval War College classes combine students of various services, rank, and experience. Some perceived dominance may exist because of normal military customs and cultural awareness. In the public university setting, dominance can occur due to individual differences in related job and life experience, age, knowledge, skills, and abilities.

Hypothesis 5

Hypothesis 5 proposes a positive correlation between self-reported social loafing and dominance in online learning groups. The results of this study indicate a positive correlation between self-reported social loafing and dominance. This suggests that dominance negatively affects individual participation in group activities. This supposition finds further support by the positive correlation between dominance and sucker effect. As indicated earlier, sucker effect is an individual's reduction in effort in order to avoid pulling the weight of a fellow group member.

Faculty and course designers should seriously consider the intent and composition of collaborative groups prior to implementation. Research on dominance and aggression indicates that inter-group interactions were significantly more aggressive than inter-individual (Meier & Hinsz, 2004). These researchers caution that although aggression is not automatic in group situations, caution should be exercised for potential harm. They also suggest that careful prior planning that includes appropriate emphasis on cooperative goals may result in positive outcomes and avoidance of aggressive behaviors.

Strengths, Limitations, and Suggestions for Future Research

This research study provides evidence to suggest that social loafing not only exists, but may also be prevalent in the online learning classroom. Problems, identified in previous studies of face-to-face classrooms, are similar to those found in this study of online group projects. Since the distance learning environment already must deal with other potential distracters for group activities (e.g., geographical distance, time zones, work schedules), the presence of social loafing can be an additional impediment to the effectiveness of group work in the online classroom.

Issues pertaining to sample selection, differences in online group activities and survey questions may limit the current study. First, although the study sample may reflect a larger population of online or distance learners, generalization may not be possible due to limitations of course

availability, researcher contacts, and respondent availability. Other limitations include the inability to manipulate group activity for consistency, randomly assign students to groups, or collect surveys from all members of each group. Still the inclusion of many groups reporting similar perceptions is considered valuable enough to include these differences in groups in one report rather than a report of only one class and thus a smaller sample. The surveys were not constructed in a manner to compare some demographic data, such as age and gender differences in the group responses. No examination could therefore be made for these personal factors.

It is unclear without further research how significantly this phenomenon actually impedes learning in online learning groups. If future research in online settings mirror the results of face-to-face groups however, it is imperative that online instructors and designers consider social loafing implications when designing online group work. Face-to-face research on task impairments indicates that although social loafing in collective groups tend to impair simple task achievement, the opposite is true for complex tasks (Jackson & Williams, 1985). Social loafing in collective groups therefore may not always be a bad thing. Jackson and Williams contend that under certain circumstances social loafing (i.e., working less hard) may result in reduced stress and subsequent improved performance. Instead of accepting social loafing as an inevitable or negative aspect of group work, instructors and designers should therefore focus on the conditions and antecedents that may lead to improved or impaired performance.

Specific attention should be given to influences on group performance that include group process, task typology, group size, administrative influence, and individual perceptions. Unless group members can successfully navigate each area, it is unlikely that group performance will be effective. Both instructors and designers should research similar psycho-social behaviors such as free riding, shirking, and lurking. These psycho-social behaviors have different antecedents and can be easily mistaken for social loafing. Faculty and course designers should consider how current online research into social presence and models such as Community of Inquiry can be adapted to capture and incorporate these psycho-social factors. Garrison, Anderson and Archer (2000) proposed a template that measures indicators of social presence that include emotions, communication, and group cohesion. These measures could be adapted and utilized to aid faculty in detecting social loafing antecedents.

Additionally, instructors and designers should consider how improved technology can assist in both facilitating and tracking group performance. Recent improvements in synchronous classroom technology (e.g., *Horizon, Wimba, Elluminate*), learning management system (LMS) extensions (e.g., learning objects, *Blackboard Building Blocks*), and collaborative software (e.g., *Google Docs, WiZiQ, Kaltura*) are designed to facilitate collaborative learning with improved tracking for faculty. It is important for individual group members, faculty, and administration to work together as a team to ensure that the entire system supports an environment in which successful goal achievement is possible.

Future research in this area should strive to study intact groups in large enrollment classes. Collecting data from all group members would allow group level analysis. Researchers should also consider including qualitative aspects to their research such as group member interviews and focus groups. Previous research utilizing qualitative analysis has yielded valuable information regarding group member perceptions and how these perceptions may influence future group interactions (Gillespie, Rosamond & Thomas, 2006). Perceptions could then be analyzed both within and between online groups. Other recommendations for future research include controls that would sift out the impact of closely related theories such as equity theory (Walster, Berscheid & Walster, 1973) and the differences between military students and their civilian counterparts. Differences examined might include job related education, military influence, military bearing,

motivation, desire to succeed, prior exposure to stressful group environments, and personality traits.

One should not assume that merely because social loafing exists in face-to-face and online courses that the solutions in one setting will be the same in the other. It is therefore incumbent upon distance education researchers to further study the phenomenon of social loafing in distance learning environments and attempt to uncover ways to mitigate, facilitate, or eliminate the phenomenon of social loafing.

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Online Self-Regulatory Learning Behaviors as a Mediator in the Relationship between Online Course Perceptions with Achievement

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Abstract

Positive perceptions of online course communication and collaboration have been associated with better academic outcomes, while self-regulatory learning behaviors have also been linked to academic achievement and other positive learning outcomes. In the current study, we examined whether self-regulatory learning behaviors may be considered as mediating the relationship between student perceptions of online course communication and collaboration with academic achievement as measured by grade point average (GPA). Results indicate that online self-regulatory learning behaviors, though not strongly associated with academic achievement in and of themselves, do mediate the positive relationship between student perceptions of online course communication and collaboration with academic achievement.

Keywords: Self-regulation; online learning; achievement

Introduction

As part of the annual Sloan-C online survey, chief academic officers at institutions of higher education across the nation indicated that "a barrier to widespread adoption of online learning" was the fact that "students need more discipline to succeed in online courses" (Allen & Seaman, 2006, p. 13). The importance of self-regulation in improving learning outcomes in online and face-to-face formats cannot be overstated. Research literature has concluded that students who are more able to regulate their learning perform better than those students who are less able to regulate their learning (Schunk & Zimmerman, 1998; Zimmerman & Schunk, 2001). Self-regulated learning has been referred to as the desired outcome of the process of "students' self-generated thoughts and behaviors that are systematically oriented toward the attainment of their learning goals" (Zimmerman & Schunk, 2001, p. 125). Self-regulation as such can be viewed as the requisite discipline of the individual in their learning process, whether this process takes place in an online or face-to-face environment. Examples of self-regulatory behaviors in learning include, but are not limited to, goal setting and environment structuring. Some of these self-regulatory behaviors, like goal setting, appear to be more explicit, while others, like environment structuring (e.g., turning off a television while you work), appear to be more implicit. Whether implicit or explicit, these self-regulatory behaviors do have an effect on the achievement and performance of learners.

Bandura (1997) has emphasized the ability to self-regulate as the ability to exercise control over one's behavior, which suggests evidence towards the role of an individual's cognition in their observed behaviors. The influence an individual's cognitive ability to self-regulate stands in contrast to behaviorist perspectives on learning and is unique to Bandura's (1986; 1997) social cognitive perspective. From a social cognitive perspective, Zimmerman and Schunk (2001) postulate that the ability to self-regulate one's learning develops in a cyclical nature as the interaction of personal, behavioral, and environmental factors. As self-regulatory skills develop across time, the source of influence appears to shift from environmental to more personal factors with behavioral factors providing feedback (Zimmerman & Schunk, 2001). As applied to learners in online environments, the development of self-regulatory skills would appear to first derive from the online learning environment factors, where learners would receive feedback from their behaviors in these online environments (e.g., lack of checking in online leading to missed assignment deadlines, etc.). While self-regulatory behaviors in online learning environments would appear to develop similarly as in other domains, self-regulatory behaviors have been indicated as being "highly context dependent" (Zimmerman & Schunk, 2001, p.125) requiring the examination of self-regulatory behaviors within the context of the online learning environment.

Online and distance learning environments are, indeed, unique contexts requiring examination. Moore (1991; 1993) discusses the unique context of the distance or online learning environment from the perspective of teacher-learner relationships. According to Moore (1991; 1993), the teacher and learner in online or distance learning are always separated by space and sometimes both time and space. This separation by space creates a psychological or transactional distance between the learner and instructor. The degree to which this transactional distance effects the teacher-learner relationship appears to be the function of three clusters of variables referred to as: (a) dialogue, (b) structure, and (c) learner autonomy (Moore, 1993). Moore's learner autonomy can be likened to the ability of learner's self-regulation from the social cognitive perspective. Moore (1993) defines learner autonomy as "the extent to which in the teaching/ learning relationship it is the learner rather than the teacher who determines the goals, the learning experiences, and the evaluation of decisions. . ." (p. 31). From the perspective of the theory of transactional distance, learners who are more autonomous or self-regulated appear to be more comfortable in online or distance programs than learners who are less autonomous or self-regulated (Moore, 1993, p. 32). For online courses in particular, Howland and Moore (2002) have indicated that self-regulatory learning behaviors were important for courses delivered through the Internet, and as being associated with more positive academic outcomes including student retention and program satisfaction. In examining the open-ended responses of 48 online students, Howland and Moore (2002) additionally found that students who engaged in more online self-regulatory learning behaviors generally had more positive perceptions of online courses. The magnitude and form of the relationship among student perceptions of online course communication and collaboration, self-regulatory learning behaviors, and academic achievement in online courses, however, has yet to be quantitatively examined.

In a qualitative study of online course curriculum and instruction, Fisher and Baird (2005) found that fostering a sense of community positively influenced student retention over the course of a period of two years. Noting that this sense of community and support felt by students was associated with increased online self-regulatory learning behaviors, Fisher and Baird also found that students engaging in communication online tended to want to meet peer expectations and to be valued in the eyes of their peers, and thus were more likely to choose to engage in online self-regulatory learning behaviors to meet those expectations. Fisher and Baird concluded two means of encouraging student self-regulation was (a) peer evaluations and (b) small group projects which served to create an online learning environment wherein students feel accountable to meet

the expectations of others. In this way, Fisher and Baird (2005) highlight means of improving student learning by priming a social interaction schema within the learner, essentially fueling their sense of social agency. Due to the student-desired end of social acceptance and desirability by others, collaborative group activities serves as means of improving student online learning.

The purpose of this study was to examine whether online self-regulatory learning behaviors in online courses may be considered as mediating the relationship between student perceptions of online course communication and collaboration with academic achievement. To achieve the purpose of this study, we employed structural equation modeling as an advanced statistical means of examining mediating relationships (Bollen, 1989). From a review of the literature, it is clear that student perceptions of online course communication and collaboration are positively associated with academic achievement and more positive academic outcomes (see Fisher & Baird, 2005; Howland & Moore, 2002; Lee & Gibson, 2003). The question therefore becomes: By what mechanism(s) does this positive relationship between student perceptions of online course communication and collaboration and academic achievement occur? In this study, we examine whether online self-regulatory learning behaviors mediate the relationship between student perceptions of online courses and academic achievement.

One explanation may be an issue of self-selection bias, where students who have better achievement in online courses would of course have better perceptions of online courses in general, including course communication and collaboration. Not all students who succeed in online courses, however, hold positive perceptions of online course communication and collaboration. In a study of 231 students enrolled in online or distance programs, Barnard, Paton, and Rose (2007) found that students' self-reported perceptions of online course communication and collaboration appeared to differ as a matter of degree program. Students enrolled in programs categorized as more hard sciences, such as engineering, tended to have less positive perceptions than students enrolled in more soft sciences, such as education. Indeed, student enrolled in the soft sciences tended to hold more positive perceptions of online course communication and collaboration.

Another explanation as to this positive relationship between student perceptions of online course communication and collaboration and academic achievement is that online self-regulatory learning behaviors serves as catalyst or means through which student perceptions of online course communication and collaboration translate into academic outcomes. We hypothesize that students who have more positive perceptions of online course communication and collaboration will engage in more online self-regulatory learning behaviors, which, in turn, is positively associated with academic achievement and vice-versa. While these self-regulatory learning behaviors cannot completely mediate the positive relationship between student perceptions of online course communication and collaboration and academic achievement, self-regulation in online learning environments has been found to be influential to student success in computer-mediated curriculum and instruction (King, Harner & Brown, 2000).

Method

Participants

The study consisted of a sampling frame of 628 unduplicated students with working (i.e., deliverable) email addresses enrolled in online courses at a large, public university located in the Southwestern United States. Of these students taking online courses, 204 self-selected to complete the online survey by responding to a recruitment email message. Participants were

informed as to the voluntary nature of the study and assured as to the confidentiality of their responses. Approximately 36 percent of the participants identified themselves as male (n = 73) and 82.6 percent as white (n = 168). The mean age of the participants was 38, with a standard deviation of 9.93, ranging from 22 to 65 years of age. Approximately 82 percent of the participants (n = 167) were studying online at the graduate or post-baccalaureate level (e.g., teacher certification). Respondents were enrolled in 24 different academic degree programs and listed home addresses in 146 different US postal zip codes.

Measures

For the outcome variable of academic achievement, the current, cumulative grade point averages (GPAs) of the participants were obtained from the university. Students who participated in the study had GPAs that ranged from 2.00 to 4.00, with a mean of 3.73 and standard deviation of .41. As the sample consisted mainly of students studying at the graduate or post-baccalaureate level, GPAs being positively-skewed may be considered typical. The GPAs reflect grade points earned from coursework offered online or at a distance. To measure student perceptions of online course communication and collaboration, an 11-item scale with a 5-point Likert-type response format with values ranging from strongly agree (5) to strongly disagree (1) was constructed (Rose, 2006). Higher total scale scores on this scale indicate more positive perceptions toward online course communication and collaboration, while lower total scale scores indicate less positive perceptions. Positive perceptions of online course communication and collaboration can be defined as the willingness of individuals to be engaged in online communication and collaboration. This 11-item scale revealed an acceptable internal consistency of scores obtained from the scale with $\alpha = .94$. Nunnally (1978) has suggested that score reliability of .70 or better is acceptable when used in basic social science research, such as in this study. Barnard, Paton, and Rose (2007) present a fully accessible copy of all items on this scale including further psychometric information. Examples of two items from the scale are as follows:

- I felt like I was part of a community with my classmates in my online course.
- Online classes without collaborative (group) activities make me feel isolated from my classmates and/ or alone.

To measure self-regulation in online learning, a short form of the Online Self-regulated Learning Questionnaire (OSLQ) was employed. The short form of the Online Self-regulated Learning Questionnaire (OSLQ) is a 24-item scale with a 5-point Likert-type response format having values ranging from strongly agree (5) to strongly disagree (1). Higher scores on this scale indicate better self-regulation in online learning by students. The short form was developed from an 86-item long form of the instrument by examining internal consistency and exploratory factor analyses results for data collected from the long form. The long form of the instrument was developed to reflect a multi-dimensional conception of self-regulated learning as derived from the 1998 work of Zimmerman (Lan, Bremer, Stevens & Mullen, 2004). In contrast to the long form of the instrument, the short form consists of six important constructs of self-regulation in online learning, namely: (a) environment structuring; (b) goal setting; (c) time management; (d) help seeking; (e) task strategies; (f) and self-evaluation. The internal consistency of scores obtained for the short form of the OSLQ in study was $\alpha = .93$. Table 2 (see appendix) contains all items of the OSLQ along with subscale designation. Examples of two items from the time management and goal setting aspects of the scale respectively from the short form are as follows:

- Although we don't have to attend daily classes, I still try to distribute my studying time evenly across days.

- I set standards for my assignments in online courses.

Procedure

All measures were administered online along with a series of demographic questions. All participants were assured that their responses would remain confidential when recruited for their participation. Data were imported from the online survey into a Microsoft Excel format and then imported into SPSS (v. 12.0). Structural equation modeling analyses were performed in MPlus (v. 4.20). Values for missing data were handled using full information maximum-likelihood (FIML) as the method of estimation. As an extension of maximum likelihood, FIML takes advantage of all possible data points in analysis. Enders and Bandalos (2001) have indicated that full information maximum-likelihood is superior to list-wise, pair-wise, and similar response pattern imputations in handling missing data that may be considered ignorable.

Analysis

To examine whether self-regulation in online learning may be considered as mediating the relationship between student perceptions of online course communication and collaboration and academic achievement, we utilized structural models (see Figure 1). Direct and indirect effects were calculated using MPlus (v. 4.20). Five statistics reflecting fit were reported: the chi-square statistic; the ratio of chi-square statistic to degrees of freedom; the root mean square error of approximation (RMSEA); the Tucker Lewis Index (TLI), also known as the Non Normed Fit Index (NNFI); and the Comparative Fit Index (CFI). No post hoc model modifications were made.

Results

In modeling the student self-regulation in online learning as a mediator in the relationship between student perceptions of online course communication and collaboration and achievement, the chi-square goodness-of-fit statistic was significant, indicating that the model may not fit the data, $\chi 2(622) = 917.31$, $p < .05$. The chi-square statistic, however, has been indicated as being sensitive to sample size, thus an adjunct discrepancy-based fit index may be used as the ratio of chi-square to degrees of freedom ($\chi 2/df$). A $\chi 2/df$ ratio value less than 5 has been suggested as indicating an acceptable fit between the hypothesized model and the sample data (MacCallum, Brown & Sugawara, 1996). With a $\chi 2/df$ ratio value of 1.47, the proposed model may have an acceptable fit. The root mean square error of approximation (RMSEA) as compensating for the effects of model complexity was 0.05, which according to Browne and Cudek (1993) indicates an acceptable fit of the model being less than or close to 0.05. The value of Tucker Lewis Index (TLI), also known as the Non Normed Fit Index (NNFI) was .94 and value of the Comparative Fit Index (CFI) was .93. Hu and Bentler (1999) note that fit index values of .95 (or close to it) are indicative of good fit. Thus, the model appears to fit the data well as seen in Figure 1. The paths in the model were all significant with standardized values ranging from .46 to .94. Table 1 contains the standardized path coefficients from the latent variable constructs to the items for both scales and from the higher order construct of online self-regulation to the latent variable subscales of the OSLQ.

The relationship between student perceptions of online course communication and collaboration and student GPA was moderately strong and positive with a standardized path coefficient value of .43, which was significant at the .01 level (see Figure 1). As student perceptions of online course communication and collaboration increase, academic achievement as measured by GPA appears to increase as well. Additionally, the relationship between online learning self-regulation and student perceptions of online course communication and collaboration appeared to be strong and positive with a standardized path coefficient value of .70, which was significant at the .01 level. As student perceptions of online course communication and collaboration increase, student self-regulation in online learning as measured by the short form of the OSLQ appears to increase as well. The relationship between student self-regulation in online learning and academic achievement (e.g., GPA) was weak and positive with a standardized path coefficient value of .18, which was significant at the .05 level. As student self-regulation in online learning is higher, academic achievement as measured by GPA appears to be better as well. In modeling the extent of this mediating relationship in MPlus (v. 4.20), the indirect effect of self-regulation in online learning between student perceptions of online course communication and collaboration and GPA was a standardized path coefficient value of .13, which was significant at the .05 level. These results indicate that student self-regulation in online learning may be considered as positively mediating the relationship between student perceptions of online course communication and collaboration and achievement as measured by GPA. As student self-regulation in online learning increases, student perceptions of online course communication and collaboration increase which, in turn, is positively associated with academic achievement.

Figure 1. Path diagram with online learning self-regulation as a mediator

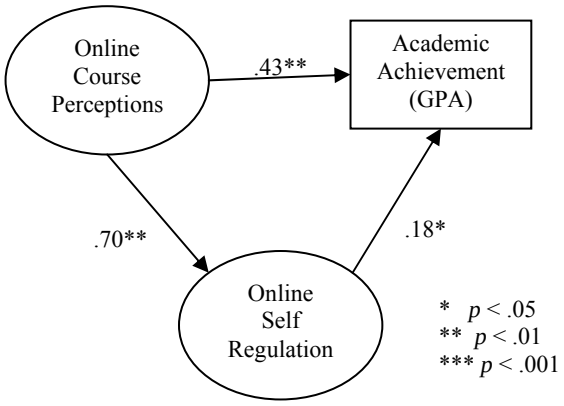

Table 1. Standardized path coefficients from latent to observed variables

Path	Std. Coeff.	Path	Std. Coeff.
Perceptions of Online Course Communication & Collaboration			
Online Perceptions → OPQ1	.64	Online Perceptions → OPQ7	.81
Online Perceptions → OPQ2	.83	Online Perceptions → OPQ8	.83
Online Perceptions → OPQ3	.87	Online Perceptions → OPQ9	.77
Online Perceptions → OPQ4	.86	Online Perceptions → OPQ10	.78
Online Perceptions → OPQ5	.78	Online Perceptions → OPQ11	.53
Online Perceptions → OPQ6	.63		
Online Self-Regulated Learning by Subscale			
Environment Structuring → ESQ1	.81	Help Seeking → HSQ13	.53
Environment Structuring → ESQ2	.87	Help Seeking → HSQ14	.73
Environment Structuring → ESQ3	.86	Help Seeking → HSQ15	.44
Environment Structuring → ESQ4	.79	Help Seeking → HSQ16	.37
Goal Setting → GSQ5	.79	Task Strategies → TSQ17	.63
Goal Setting → GSQ6	.80	Task Strategies → TSQ18	.56
Goal Setting → GSQ7	.79	Task Strategies → TSQ19	.57
Goal Setting → GSQ8	.85	Task Strategies → TSQ20	.64
Goal Setting → GSQ9	.58	Self Evaluation → SEQ21	.61
Time Management → TMQ10	.74	Self Evaluation → SEQ22	.40
Time Management → TMQ11	.70	Self Evaluation → SEQ23	.80
Time Management → TMQ12	.72	Self Evaluation → SEQ24	.78
Higher order paths to latent subscales of OSLQ			
Online Self-Regulation → Environment Structuring	.54	Online Self-Regulation → Goal Setting	.34
Online Self-Regulation → Time Management	.62	Online Self-Regulation → Help Seeking	.72
Online Self-Regulation → Task Strategies	.47	Online Self-Regulation → Self Evaluation	.65

Discussion

As hypothesized, online self-regulatory learning behaviors appear to be positively mediating the relationship between students' perceptions of online course communication and collaboration and academic achievement. Online self-regulatory learning behaviors were only weakly associated with better academic achievement by themselves. The indirect effect of online self-regulatory learning behaviors was estimated with a standardized path coefficient value of .13, while the direct effect of perceptions of online course communication and collaboration with academic achievement was estimated with a standardized path coefficient value of .43 (both significant at the .05 level; see Figure 1). This result indicates that approximately one third of the association between student perceptions of online course communication and collaboration and academic achievement may be accounted for by online self-regulatory learning behaviors. While online self-regulatory learning behaviors do not appear to be that strongly associated with academic achievement, self-regulatory learning behaviors do appear to mediate and account for a significant amount of the positive relationship between student perceptions of online course communication and collaboration with academic achievement. In other words, online self-regulatory learning behaviors do mediate the relationship between perceptions of online courses and academic achievement. As online self-regulatory learning behaviors increase, the relationship between perceptions of online course communication and academic achievement also strengthens.

Results clearly indicate that as student perceptions of online course communication and collaboration become more positive, their self-reported degree of self-regulation in online learning also increases with a standardized path coefficient value of .70. Students who report higher levels of self-regulation in online courses appear to have better perceptions of online course communication and collaboration; students who have less positive perceptions of online course communication and collaboration report lesser levels of self-regulation in online courses. Additionally, the results of this study indicate that as student perceptions of online course communication and collaboration become more positive, their academic achievement as measured by GPA also improves, which is supported by extant research literature (e.g. Fisher & Baird, 2005; Howland & Moore, 2002; Lee & Gibson, 2003).

While it appears that student self-regulation in online learning is not strongly related to academic achievement as measured by GPA (see Figure 1), this finding does not negate the importance of self-regulatory learning behaviors, but informs online instruction and course design. We suggest that students must first have positive perceptions of online course communication and collaboration in order to engage in self-regulated learning in the online classroom to a sufficient degree that it may positively influence academic achievement as measured by GPA. This research indicates that the prerequisite variable of positive perceptions of online course communication and collaboration may also lend to self-regulatory behaviors in online learning, which mediates higher academic achievement as measured by GPA. Other variables not examined may also serve the function as additional prerequisites to self-regulation in online learning. We suggest that instructors and designers of online course curricula be especially concerned with creating learning environments where positive perceptions toward online course communication and collaboration may be formed and fostered.

Future research should re-examine this mediating relationship of self-regulation in online learning between student perceptions of online course communication and collaboration and academic achievement as measured by GPA so as to further validate findings. Additionally, lack of sufficient sample size did not permit the multi-group modeling of this mediating model as shown

in Figure 1. Multi-group modeling in SEM permits the properties of a model to be assessed across groups (Joreskog, 1971). Gender differences in this mediating relationship, along with other relevant variables, could be examined using multi-group modeling.

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Appendix

Short form of the Online Self-regulated Learning Questionnaire

Item	Subscale
I set standards for my assignments in online courses.	Goal Setting
I set short-term (daily or weekly) goals as well as long-term goals (monthly or for the semester).	Goal Setting
I keep a high standard for my learning in my online courses.	Goal Setting
I set goals to help me manage studying time for my online courses.	Goal Setting
I don't compromise the quality of my work because it is online.	Goal Setting
I choose the location where I study to avoid too much distraction.	Environment Structuring
I find a comfortable place to study.	Environment Structuring
I know where I can study most efficiently for online courses.	Environment Structuring

I choose a time with few distractions for studying for my online courses.	Environment Structuring
I try to take more thorough notes for my online courses because notes are even more important for learning online than in a regular classroom.	Task Strategies
I read aloud instructional materials posted online to fight against distractions.	Task Strategies
I prepare my questions before joining in the chat room and discussion.	Task Strategies
I work extra problems in my online courses in addition to the assigned ones to master the course content.	Task Strategies
I allocate extra studying time for my online courses because I know it is time-demanding.	Time Management
I try to schedule the same time every day or every week to study for my online courses, and I observe the schedule.	Time Management
Although we don't have to attend daily classes, I still try to distribute my studying time evenly across days.	Time Management
I find someone who is knowledgeable in course content so that I can consult with him or her when I need help.	Help Seeking
I share my problems with my classmates online so we know what we are struggling with and how to solve our problems.	Help Seeking
If needed, I try to meet my classmates face-to-face.	Help Seeking
I am persistent in getting help from the instructor through e-mail.	Help Seeking
I summarize my learning in online courses to examine my understanding of what I have learned.	Self-Evaluation
I ask myself a lot of questions about the course material when studying for an online course.	Self-Evaluation
I communicate with my classmates to find out how I am doing in my online classes.	Self-Evaluation
I communicate with my classmates to find out what I am learning that is different from what they are learning.	Self-Evaluation

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Does the Community of Inquiry Framework Predict Outcomes in Online MBA Courses?

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Abstract

While Garrison and colleagues' (2000) Community of Inquiry (CoI) framework has generated substantial interest among online learning researchers, it has yet to be subjected to extensive quantitative verification or tested for external validity. Using a sample of students from 55 online MBA courses, the findings of this study suggest strong empirical support for the framework and its ability to predict both perceived learning and delivery medium satisfaction in online management education. The paper concludes with a discussion of potential implications for online management education researchers and those interested in further study of the CoI framework.

Keywords: community of inquiry framework; online MBA courses; learning outcomes

Introduction

In spite of the explosion of empirical research on online learning effectiveness over the last decade (Sitzmann, Kraiger, Stewart, & Wisher, 2006; Tallent-Runnels, Thomas, Lan, Cooper, Ahern, Shaw, & Liu, 2006), the emergence of a dominant theoretical framework that explains online learning effectiveness has yet to occur. While there are several potential emerging models of online business education (e.g., Alavi & Leidner, 2001; Leidner & Jarvenpaa, 1995; Rungtusanatham, Ellram, Siferd, & Salik, 2004; Sharda, Romano, Lucca, Weiser, Scheets, Chung, & Sleezer, 2004), one that has attracted the most attention is the Community of Inquiry (CoI) framework developed by Garrison, Anderson and Archer (2000). Google Scholar shows that Garrison and colleagues' initial article describing the framework has been cited in other works at least 260 times as of October 2007, making it by far the most cited article from the journal The Internet and Higher Education. However, while the CoI framework is gaining increasing attention among education scholars (Anagnostopoulos, Basmadjian, & McCrory, 2005; Arnold & Ducate, 2006; Meyer, 2004; Shea, 2006), studies that examine the framework's generalizability to online learning in other disciplines is somewhat limited. Also, while the CoI framework has received extensive examination in qualitative studies (Anagnostopoulos et al., 2005; Garrison & Cleveland-Innes, 2005; Heckman & Annabi, 2005; Oriogun, Ravenscroft, & Cook, 2005; Stodel, Thompson, & MacDonald, 2006), and individual components of the framework have been examined empirically (Arbaugh & Hwang, 2006; Richardson & Swan, 2003; Shea, Fredericksen, Pickett, & Pelz, 2003; Wise, Chang, Duffy, & del Valle, 2004), studies that empirically examine all components of the framework simultaneously are limited. Because

of this relative lack of empirical research, studies that examine the relationship between any of the framework's dimensions and learning outcomes are only now beginning to emerge (Shea, 2006; Shea, Li, & Pickett, 2006). Because of this relative lack of empirical research, presently there is little evidence available to consider whether there are significant relationships between any of the framework's dimensions and course outcomes (Ho & Swan, 2007). In fact, one of the framework's creators recently has suggested that this stream of research needs to move from early exploratory and descriptive studies toward rigorous empirical analysis (Garrison, 2007). Therefore, if the CoI framework is to gain legitimacy as a theory of online learning, we need more empirical studies to assess its explanatory power in fields beyond general education.

The purpose of this paper is to report on the results of a study that examines whether the CoI dimensions of social, teaching, and cognitive presence distinctively exist in management education e-learning environments, and whether and to what extent these dimensions are associated with perceived learning and delivery medium satisfaction in online MBA courses. By doing this, the paper provides initial insights into the empirical verification of the CoI framework and its potential for generalizability to online management education. The rest of the paper is organized as follows. The first section of the paper describes the CoI framework and reviews recent studies on its three dimensions: social, cognitive, and teaching presence, and uses this literature to hypothesize relationships between these dimensions and student perceived learning and delivery medium satisfaction. The paper's second section presents the development of the research sample of MBA students in online courses over a two-year period at a Midwestern U.S. university and describes the survey items used to measure the CoI dimensions. Next, the results section of the paper describes an exploratory factor analysis of the CoI measures and a regression analysis used to test the study's hypotheses. Finally, the discussion section presents primary conclusions and contributions and potential implications of these findings for online management education instructors and researchers.

The Community of Inquiry Framework

Garrison and colleagues (2000) developed the CoI framework to investigate how features of written language used in computer conferencing activities promote critical/ higher-order thinking. They contend that higher-order learning experiences are best conducted as a community of inquiry composed of teachers and learners (Lipman, 1991) requiring both the engagement of "real" persons and the demonstration of critical thinking to be successful. Their framework posits that effective online learning is a function of the interaction of three elements: teaching presence, social presence, and cognitive presence. The following section describes these three elements and develops hypotheses for each regarding their relationship to online course outcomes. Since it is the element that has been most recently conceptualized, teaching presence is discussed first and most extensively.

Teaching Presence

Garrison and colleagues (2000) contend that while interactions between participants are necessary in virtual learning environments, interactions by themselves are not sufficient to ensure effective online learning. These types of interactions need to have clearly defined parameters and be focused toward a specific direction, hence the need for teaching presence. They describe teaching presence as the design, facilitation, and direction of cognitive social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes. Anderson and colleagues (2001) conceptualized teaching presence as having three components: 1) instructional design and organization; 2) facilitating discourse (originally called "building understanding");

and 3) direct instruction. While recent empirical research may generate a debate regarding whether teaching presence has two (Shea, 2006) or three (Arbaugh & Hwang, 2006) components, the general conceptualization of this CoI element has been supported by subsequent research (Coppola, Hiltz, & Rotter, 2002; LaPointe & Gunawardena, 2004; Stein, Wanstreet, Calvin, Overtoom, & Wheaton, 2005).

Course Design and Organization

Anderson and colleagues (2001) describe the design and organization aspect of teaching presence as the planning and design of the structure, process, interaction and evaluation aspects of the online course. Some of the activities comprising this category of teaching presence include re-creating Power Point presentations and lecture notes onto the course site, developing audio/video mini-lectures, providing personal insights into the course material, creating a desirable mix of and a schedule for individual and group activities, and providing guidelines on how to use the medium effectively. These are particularly important activities since clear and consistent course structure supporting engaged instructors and dynamic discussions have been found to be the most consistent predictors of successful online courses (Swan, 2002; 2003). Of the three components of teaching presence, this is the one most likely to be performed exclusively by the instructor. These activities are for the most part completed prior to the beginning of the course, but adjustments can be made as the course progresses (Anderson et al., 2001).

Facilitating Discourse

Anderson and colleagues (2001) conceptualize facilitating discourse as the means by which students are engaged in interacting about and building upon the information provided in the course instructional materials. This component of teaching presence is consistent with findings supporting the importance of participant interaction in online learning effectiveness in general and in management education in particular (Arbaugh, 2005b; Benbunan-Fich & Arbaugh, 2006; Sherry, Fulford, & Zhang, 1998). This role includes sharing meaning, identifying areas of agreement and disagreement, and seeking to reach consensus and understanding. Therefore, facilitating discourse requires the instructor to review and comment upon student comments, raise questions, and make observations to move discussions in a desired direction, keeping discussion moving efficiently, draw out inactive students, and limit the activity of dominating posters when they become detrimental to the learning of the group (Anderson et al., 2001; Brower, 2003; Coppola et al., 2002; Shea et al., 2003).

Direct Instruction

Anderson and colleagues (2001) contextualized direct instruction as the instructor provision of intellectual and scholarly leadership in part through the sharing of their subject matter knowledge with the students. They also contend that a subject matter expert and not merely a facilitator must play this role because of the need to diagnose comments for accurate understanding, injecting sources of information, and directing discussions in useful directions, scaffolding learner knowledge to raise it to a new level.

In addition to the sharing of knowledge by a content expert, direct instruction is concerned with indicators that assess the discourse and the efficacy of the educational process. Instructor responsibilities are to facilitate reflection and discourse by presenting content, using various means of assessment and feedback. Explanatory feedback is crucial. This type of

communication must be perceived to have a high level of social presence/ instructor immediacy (Baker, 2004; Gorham, 1988; Richardson & Swan, 2003) to be effective. Instructors must have both content and pedagogical expertise to make links among contributed ideas, diagnose misperceptions, and inject knowledge from textbooks, articles, and Web-based materials.

The simultaneous roles of discussion facilitator and content expert within teaching presence goes beyond early contentions that online instructors needed merely to transition from a role of knowledge disseminator to interaction facilitator. Teaching presence contends that for online learning to be effective, instructors must play both roles (Arbaugh & Hwang, 2006). Considering that recent research in online management education suggests that extensive instructor engagement is necessary for positive learning outcomes (Eom, Wen, & Ashill, 2006; Marks, Sibley, & Arbaugh, 2005), it is reasonable to predict that teaching presence would influence learning in online MBA courses. Also, teaching presence's emphasis on design and organization should positively influence student satisfaction with the Internet as a delivery medium. If there is no set of activities, no timeline, no protocol, no format for course materials and no evaluation criteria, chaos will ensue in the online environment (Berger, 1999; Hiltz & Wellman, 1997). Design and organization provide the context for which discourse and direct instruction have meaning. The results of recent online management education research that shows a strong relationship between course design and structural characteristics and delivery medium satisfaction (Arbaugh & Rau, 2007; Eom et al., 2006) suggest the following hypotheses:

> *Hypothesis 1a: Teaching presence will be positively associated with student perceived learning in web-based MBA courses.*
>
> *Hypothesis 1b: Teaching presence will be positively associated with student satisfaction with the delivery medium for web-based MBA courses.*

Social Presence

Social presence in online learning has been described as the ability of learners to project themselves socially and emotionally, thereby being perceived as "real people" in mediated communication (Gunawardena & Zittle, 1997; Short, Williams, & Christie, 1976). Similar to teaching presence, social presence in virtual learning environments has been conceptualized as having three categories, which are open communication, group cohesion, and affective expression (Garrison, 2007). Affective expression specifically refers to mechanisms for injecting emotion into the environment in lieu of visual or oral cues, such as emoticons or parenthetical meta-linguistic cues such as "hmmm" or "yuk" (Gunawardena, 1995; Hiltz, 1994; Walther, 1992). Of the three types of presence included in the CoI framework, the role of social presence in educational settings has been the most extensively studied, both in online and face-to-face course settings (Gunawardena & Zittle, 1997; Richardson & Swan, 2003; Rourke, Anderson, Garrison, & Archer, 2001; Walther, 1992).

Recent research on social presence in online learning also has focused on its role in facilitating cognitive development and critical thinking. To date, this research suggests that while social presence alone will not ensure the development of critical discourse in online learning, it is extremely difficult for such discourse to develop without a foundation of social presence (Garrison & Cleveland-Innes, 2005). A recent study on the effects of inter-personality in online learning by Beuchot and Bullen (2005) suggests that increased sociability of course participants leads to increased interaction, therefore implying that social presence is necessary for the development of cognitive presence. Anagnostopoulos and colleagues' (2005) concept of inter-

subjective modality provides further support for this premise. According to these authors, inter-subjective modality in the online environment occurs when a participant explicitly refers to another participant's statement when developing their own post, thereby both connecting themselves to the other participant and laying the foundation for higher level inquiry. Other recent studies supporting the "social presence as foundation for cognitive presence" perspective include those by Molinari (2004), and Celani and Collins (2005).

Studies of student group cohesiveness and interaction on team effectiveness in online management education suggest a strong relationship between social presence and learning outcomes (Arbaugh, 2005b; Hwang & Arbaugh, 2006; Williams, Duray, & Reddy, 2006; Yoo, Kanawattanachai, & Citurs, 2002). This emerging research stream also suggests that activities that cultivate social presence also enhance the learner's delivery medium satisfaction (Arbaugh & Benbunan-Fich, 2006). Collaborative activities allow learners greater opportunities for increased social presence and a greater sense of online community, which also tends to improve the socio-emotional climate in online courses (Richardson & Swan, 2003; Rovai, 2002). Positive social climates support more rapid mastery of the "hidden curriculum" of the technological aspects of distance education (Anderson, 2002), resulting in increased satisfaction with both the learning process and the medium through which it is delivered (Arbaugh, 2004; Benbunan-Fich & Hiltz, 2003). These recent findings related to social presence in online graduate management education suggest the following hypotheses:

> *Hypothesis 2a: Social presence will be positively associated with student perceived learning in web-based MBA courses.*
>
> *Hypothesis 2b: Social presence will be positively associated with student satisfaction with the delivery medium for web-based MBA courses.*

Cognitive Presence

Garrison, Anderson, and Archer (2001) described cognitive presence as the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse, and argued that cognitive presence in online learning is developed as the result of a four phase process. These phases are: 1) a triggering event, where some issue or problem is identified for further inquiry; 2) exploration, where students explore the issue both individually and corporately through critical reflection and discourse; 3) integration, where learners construct meaning from the ideas developed during exploration; and then 4) resolution, where learners apply the newly gained knowledge to educational contexts or workplace settings. Garrison and colleagues (2001) proposed that the integration phase typically requires enhanced teaching presence to probe and diagnose ideas so that learners will move to higher level thinking in developing their ideas.

Of the three types of presence in the CoI framework, cognitive presence likely is the one most challenging to develop in online courses (Celani & Collins, 2005; Garrison & Cleveland-Innes, 2005; Moore & Marra, 2005). Emerging research suggests a complementary relationship between teaching presence and cognitive presence. While social presence lays the groundwork for higher-level discourse, the structure, organization, and leadership associated with teaching presence creates the environment where cognitive presence can be developed. Garrison and Cleveland-Innes (2005) found that course design, structure, and leadership significantly influence the extent to which learners engage course content in a deep and meaningful manner. These findings suggest that the role of instructors in cultivating cognitive presence is significant, both in terms of how they structure the course content and participant interactions. Given the previous

discussion of the consistency between findings regarding teaching presence and emerging online management education research, it is reasonable to expect that the complementarities between teaching presence and cognitive presence found in online general education also extend to online graduate management education, particularly since initial studies in such settings suggest that virtual learning environments can help produce enhanced cognitive knowledge (Alavi, Marakas, & Yoo, 2002; Yoo et al., 2002). Hence, the following hypotheses:

> *Hypothesis 3a: Cognitive presence will be positively associated with student perceived learning in web-based MBA courses.*
>
> *Hypothesis 3b: Cognitive presence will be positively associated with student satisfaction with the delivery medium for web-based MBA courses.*

Method

Sample and Data Collection

The sample for this study came from 55 of the 56 online courses conducted in the MBA program of a Mid-Western U. S. university over six semesters from February 2004 through January 2006. These courses were in subjects such as organizational behavior/ theory, international business, business strategy, human resource management, project management, operations management, information systems, finance, accounting, and professional development. Seventeen (n = 17) different instructors taught the courses included in the study. These instructors ranged from having no prior online teaching experience to having taught over forty previous online courses during the period of the study. This university was in a transition between course management software systems during the period of the study. Therefore, six of the courses in the first two semesters of the study were conducted using the Blackboard software platform, while subsequent courses were conducted using Desire to Learn (D2L). Both course management systems have synchronous and asynchronous interaction capability. The courses were distance learning classes with students taught primarily through asynchronous Web-based interactions, and 40 of the class sections had an on-site orientation meeting. Class sizes ranged from 7 to 49.

Data collection was completed in a two-step process. In the first step, students were emailed a survey during the final week of the course regarding their perceptions of the learning environment, course management system, instructor behaviors, the knowledge they acquired, and their satisfaction with the internet as the course delivery medium. The second step was conducted 7 to 10 days after the electronic survey was sent. In this step, students who had not responded to the electronic survey were mailed a paper copy of the original survey. In terms of numbers, 656 students provided useable responses, resulting in a response rate of 54.7 percent (656 of 1,200). The mean student age was 32.70 (SD = 6.34), and 57 percent of the respondents were male.

Measures

Dependent variables

Perceived student learning and satisfaction with the course delivery medium were the study's dependent variables. These variables were derived by a factor analysis using a Varimax rotation of 11 items previously used to measure these variables, for which the two-factor solution explained 73.6 percent of the variance in the survey items. Perceived learning has been commonly used as a dependent variable in studies of online management education (Alavi et al.,

2002; McGorry, 2003; Yoo et al., 2002). This measure was used because other studies have shown that using course grades in multi-disciplinary studies are subject to the limitations of inconsistent assignment across courses and instructors, and a relatively restricted range in courses at the graduate level (Arbaugh, 2005a; Rovai, 2002). Perceived learning was measured using six items adapted from Alavi (1994) and Arbaugh (2000) (coefficient alpha = .94).

Satisfaction with the delivery medium also often has been a dependent variable in studies of online learning (Alavi, Wheeler, & Valacich, 1995; Chidambaram, 1996; Eom et al., 2006). Further rationale for the use of this measure is that delivery medium satisfaction may influence a student's likelihood to continue taking courses online (Arbaugh, 2000), and that it may be an indirect indicator of actual learning (Leidner & Fuller, 1997). Delivery medium satisfaction was measured using five items from Arbaugh's (2000) scales (coefficient alpha = .87).

Predictor variables

While the dimensions of the CoI framework have been examined via content analysis (Anderson et al., 2001; Garrison et al., 2001; Stodel et al., 2006), the survey-based measures that were adopted in this study allow for the use of a larger and wider sample in a relatively efficient manner. The scales for teaching presence (Course Design and Organization - 3 items; Facilitating Discourse - 3 items; and Direct Instruction - 4 items) were developed by Shea and colleagues (2003) in their study of teaching presence in the SUNY Learning Network. Eight items measuring social presence were adapted from measures used in Richardson and Swan's (2003) study, which, in turn, were developed from Gunawardena and Zittle's (1997), and Short and colleagues' (1976) conceptualizations of the construct. While some survey-based measures of cognitive presence are now available (Garrison, Cleveland-Innes, & Fung, 2004) such measures were not publicly available at the beginning of this study. Therefore, four items were developed based on Garrison and colleagues' (2001) conceptualization of cognitive presence. These items place particular focus on the final three (exploration, integration, and resolution) phases of construct since the first phase, the "triggering event", often is expressed as part of teaching presence (Garrison & Cleveland-Innes, 2005). One item from Shea and colleagues' (2003) measure of teaching presence, "The instructor provided useful information from a variety of sources that helped me to learn" was used to measure the "triggering event" phase of cognitive presence. All survey items were anchored on a 7-point scale ranging from "Strongly Agree" to "Strongly Disagree."

While survey-based measures for social presence are well established in previous research, valid and reliable measures of teaching presence can be best described as a work in progress (Arbaugh & Hwang, 2006; Shea, 2006; Shea et al., 2006). Furthermore, measures of cognitive presence are extremely limited. With the exception of Garrison and colleagues' (2004) study, there are no known studies that simultaneously examine these three constructs. Therefore, for these reasons, as well as the relative newness of the CoI framework and the use of new measures for cognitive presence, the data was analyzed using exploratory factor analysis via principal components analysis using SAS's Factor procedure with varimax rotation (Hair, Anderson, Tatham, & Black, 1992; Stevens, 2002). Cattell's (1966) Scree test and theoretical grounding of the CoI framework indicated support for three factors, which collectively accounted for 67.4 percent of the variance in the survey items. The factors and their loadings from each of the survey items are presented in Table 1. As Table 1 shows, all factors have reliability alphas of .87 or higher, which is well above the recommended .7 for exploratory research (Nunnally, 1978). Using guidelines developed by Stevens (2002), the factors were interpreted using only survey items that loaded at .40 or higher.

Table 1. Factor loadings for CoI survey items (N = 656)

	Factor 1: Teaching Presence	Factor 2: Social Presence	Factor 3: Cognitive Presence
Teaching Presence Items:			
The instructor clearly communicated important course goals *	.71	.23	.23
The instructor clearly communicated important course topics *	.71	.24	.29
The instructor provided clear instructions on how to participate in course learning activities *	.67	.23	.24
The instructor was helpful in guiding the class towards agreement/understanding about course topics that helped me to learn *	.83	.16	.26
The instructor helped to keep students engaged and participating in productive dialogue	.86	.16	.12
The instructor helped keep the participants on task in a way that helped me to learn *	.86	.19	.17
The instructor presented content or questions that helped me to learn	.78	.25	.28
The instructor helped to focus discussion on relevant issues in a way that helped me to learn *	.81	.24	.26
The instructor provided explanatory feedback that helped me to learn	.80	.16	.23
Social Presence Items:			
Online courses are an excellent medium for social interaction	.13	.63	.17
I felt comfortable conversing through the online medium	.10	.83	.09
Participant introductions enabled me to form a sense of online community	.29	.55	.24
I felt comfortable participating in the course discussions	.18	.79	.10
The instructor created a feeling of online community	.67	.36	.23
I felt comfortable interacting with other course participants	.21	.81	.15
I felt that my point of view was acknowledged by other course participants	.20	.71	.17
I was able to form distinct impressions of some course participants	.30	.55	.18
Cognitive Presence Items:			
The instructor provided useful information from a variety of sources that helped me to learn	.69	.17	.41
I have been able to apply knowledge created in this course to subsequent class assignments	.33	.20	.72
I have been able to apply the knowledge created in this course to my work or other non-class related activities	.33	.19	.82
I can describe ways to test and apply the knowledge	.33	.29	.77

created in this course			
I will be able to apply the knowledge created in this course to future work or other non-class related activities	.33	.25	.81

Note: Loadings .40 or greater noted in bold.
* - Same items as Shea et al.'s 10-item survey

Control variables

Because of their potential confounding effects in previous studies of Web-based courses in business education (Anstine & Skidmore, 2005; Klein, Noe, & Wang, 2006; Webb, Gill, & Poe, 2005; Williams et al., 2006), controls were established for class section size, student age, gender, weekly course website usage, and student prior experience with Web-based courses. Student Web-based course experience was measured by the number of prior Web-based courses taken by the student, and weekly course website usage was measured by the number of days a week the student logged onto the course site multiplied by the self-reported average number of minutes per session spent on the site. Since recent findings in online management education research suggests that instructor subject knowledge and online teaching experience influence outcomes in online courses (Arbaugh, 2005a; Arbaugh & Rau, 2007; Eom et al., 2006) both instructor online teaching and subject matter experience were controlled for by counting both the total number of Web-based courses and the number of total times the instructor had previously taught that particular course in classroom and/ or online settings for each course in the study. Potential time-related effects of a multi-semester study were controlled by coding the first semester in the study as 0 and then cumulatively coding each subsequent semester (second semester = 1, third semester = 2, etc.) (Arbaugh, 2005b). Finally, the number of credit hours and a dummy variable to measure whether a course was required or elective (0 = elective, 1 = required) were used to control for course-level effects.

Results

Table 2 presents the means, standard deviations, correlations, and inter-item reliabilities for each of the variables. While correlations above .07 are statistically significant, only 8 correlations are above .3. Also, variance inflation factors were less than 3 for all variables, suggesting that multicollinearity is not a major concern with this data (Hair et al., 1992). Both teaching presence and cognitive presence, however, are relatively highly correlated with perceived learning (r = .51 and .55 respectively). While these are rather high correlations, variance inflation for these variables was particularly low (1.26 and 1.04 respectively). Recent research also has found the dimensions of teaching presence to be strongly associated with perceived learning (Shea et al., 2006).

Table 2. Descriptive statistics and correlations

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11
1. Perceived Student Learning	5.65	1.14	(.94)										
2. Delivery Medium Satisfaction	5.03	1.39	.00	(.87)									
3. Student Age	32.70	6.33	-.03	-.02	(na)								
4. Student Gender	0.43	0.49	.02	.16	-.09	(na)							
5. No. of Prior Online Courses Taken	3.88	4.43	-.04	.16	.00	.00	(na)						
6. Student Usage	301.76	330.77	.06	.05	-.01	.05	.01	(na)					
7. Class Section Size	25.21	7.26	-.01	-.01	-.01	.04	.09	.03	(na)				
8. Course Credit Hours	2.14	0.75	-.15	-.03	-.03	.03	.15	-.06	.26	(na)			
9. Required Course	0.63	0.48	-.09	-.00	-.06	-.01	.08	-.02	.30	.64	(na)		
10. Instructor Online Experience	14.61	13.95	.27	.09	-.02	.01	-.08	.12	.03	-.60	-.41	(na)	
11. Instructor Subject Experience	8.74	6.50	.04	.07	-.07	-.02	-.03	.09	.08	.07	.35	.03	(na)
12. Teaching Presence	5.53	1.24	.51	.16	-.07	.08	-.06	.11	.02	-.17	-.11	.42	.12
13. Social Presence	5.46	0.99	.19	.47	-.05	.06	.12	.03	.05	-.00	.09	.03	.06
14. Cognitive Presence	5.57	1.17	.55	.04	.03	.06	-.02	.04	-.03	-.07	-.08	.13	-.02

Table 2. Descriptive Statistics and Correlations (cont.)

Variable	Mean	S.D.	12	13	14
12. Teaching Presence	5.53	1.24	(.95)		
13. Social Presence	5.46	0.99	.00	(.87)	
14. Cognitive Presence	5.57	1.17	.00	.00	(.90)

Note: Correlations greater than .07 are significant at the $p<.05$ level. Values on the diagonal are internal consistency reliabilities.

Table 3 (next page) presents the results of hierarchical regression analyses on perceived learning and delivery medium satisfaction respectively. The regression coefficients for each of the three types of presence will be used to test the study's hypotheses.

Table 3. Results of regression analyses on dependent variables (N = 656)

	Perceived Student Learning		Delivery Medium Satisfaction	
Variables	*Model 1*	*Model 2*	*Model 1*	*Model 2*
Control Variables:				
Semester	-.07+	.01	-.08+	-.09*
Age	-.01	-.00	.01	.03
Gender	.01	-.06*	.16***	.13***
No. of Prior Online Courses Taken	-.02	-.02	.17***	.13***
Student Usage	.03	-.02	.02	.02
Class Section Size	-.02	.01	-.03	-.03
Course Credit Hours	.01	-.07+	.01	.02
Required Course	.01	.01	.01	-.05
Instructor Online Experience	.29***	-.06+	.12*	.03
Instructor Subject Experience	.03	-.03	.10*	.07+
Predictor Variables:				
Teaching Presence		.54***		.15***
Social Presence		.20***		.45***
Cognitive Presence		.55***		.03
F	5.56***	75.14***	5.26***	20.23***
Degrees of freedom	10,647	13,643	10,647	13,643
Adj. R-squared	0.06	0.60	0.06	0.28
Change in R-squared		0.54***		0.22**

Note: Standardized regression coefficients reported.
+ p < .1
*p < .05
**p < .01
***p < .001

Hypotheses 1a and 1b predicted that teaching presence would be positively associated with perceived student learning and delivery medium satisfaction respectively. However, while both hypotheses are strongly supported (p<.001), teaching presence is a much stronger predictor of perceived learning (b = .54) than of delivery medium satisfaction (b = .15). Hypotheses 2a and 2b predicted that social presence would be positively associated with perceived student learning and delivery medium satisfaction respectively. Again, both hypotheses are strongly supported (p<.001). For these hypotheses, however, social presence is a much stronger predictor of delivery medium satisfaction (b = .45) than of perceived learning (b = .20). While cognitive presence is a strong predictor of perceived learning (b = .55), it is not a significant predictor of delivery medium satisfaction, and therefore Hypothesis 3a is supported but not Hypothesis 3b.

Discussion

Explanations of Findings

The fact that elements of a relatively new theoretical framework not only could be reliably measured, but uniquely account for 54 percent of the variance in student perceived learning is noteworthy. Although the findings of this study need to be supported by future research, they do suggest that the CoI framework may be a powerful yet parsimonious predictor of perceived learning in online MBA courses. This should be cause for encouragement for both researchers interested in the CoI framework and those interested specifically in online management education. The study contributes to the literature on the CoI framework in that it quantitatively examines all three types of presence and their relationships to course outcomes using a multi-course sample large enough to provide appropriate statistical power. Compared to other recent studies, the findings suggest a highly reliable yet relatively efficient set of survey items for measuring the CoI framework, and researchers certainly should consider incorporating them into future studies.

While the study's design does not allow for the testing of a sequential model, the findings that teaching presence and cognitive presence were the stronger predictors of perceived learning support Garrison and Cleveland-Innes' (2005) contention that social presence is a necessary, but not sufficient condition, for student learning in the online environment. The findings of this study suggest that while social presence is important, teaching and cognitive presences are the primary and the complementary drivers of such learning. Given recent research results indicating the importance of instructors in virtual learning environments (Benbunan-Fich & Arbaugh, 2006; Brower, 2003; Coppola et al., 2002; Peltier, Schibrowsky, & Drago, 2007), the results of this study provide additional clarity regarding the nature of the instructor's role and its importance.

More specific to the domain of online management education research, the findings of the study build upon emerging frameworks of online course effectiveness. Considering that the statistical significance of prior instructor online teaching experience as a predictor of perceived learning was almost completely mitigated by the introduction of teaching, social, and cognitive presence, the strength of the relationship of these factors to perceived learning suggests that they may be stronger predictors than are technology or pedagogical characteristics for offsetting instructor experience effects in online management education (Anstine & Skidmore, 2005; Arbaugh, 2005b). The study also builds upon Arbaugh's (2005b) recent study by clarifying the nature of participant interaction necessary for a successful online course. Rather than merely engaging other participants for engagement's sake, the instructor's interaction should be of a nature that intentionally pushes students to think deeply and in an integrative manner, allowing for ideas to become further refined as a result of engagement with other participants (Brower, 2003). Students, in turn, should be seeking and discussing potential opportunities to apply this newly created and acquired knowledge to their own educational or organizational situations.

While the framework is a stronger predictor of perceived learning than delivery medium satisfaction, the fact that the CoI framework uniquely explains 22 percent of the variance in delivery medium satisfaction still is noteworthy, particularly considering that the framework was developed to explain learning effectiveness in virtual environments without consideration of other online course outcomes. This relative lack of strength of relationship, however, warrants further explanation. The most noteworthy difference between analyses of the two dependent variables is their relationship with cognitive presence. While it was a positive predictor, cognitive presence was not a statistically significant a predictor of delivery medium satisfaction. There are at least two potential explanations for this non-significant relationship. First, since the measures for

cognitive presence in this study focus more on its integration and resolution aspects, the role and significance of triggering events within the delivery medium likely are not fully captured in this study. This suggests that researchers should develop more robust measures of this construct in future studies (Garrison, 2007). Another benefit of further refinement of the measures for cognitive presence is that those efforts likely would reduce the possibility of multicolinearity between measures of cognitive presence and measures of student learning. It is possible that the post-course application orientation of the measures for cognitive presence and the post-course evaluation of student learning may have influenced the relationship between cognitive presence and perceived learning. Cognitive presence, however, has been described as "the element within a community of inquiry which reflects the focus and success of the learning experience" (Vaughan & Garrison, 2005, p. 8). The combination of this conceptualization and low variance inflation suggests that the correlation between cognitive presence and perceived learning appears to be one of natural association rather than statistical artifact.

Second, the CoI framework only considers course conduct and participant behaviors; whereas recent research suggests that other characteristics, such as characteristics of the course management system, disciplinary characteristics, and the number and variety of course assignments may be more significant predictors of delivery medium satisfaction in technology-mediated management education (Arbaugh, 2005b; Arbaugh & Rau, 2007; Webb et al., 2005). Future studies should incorporate these variables when considering the CoI-delivery medium satisfaction relationship.

Finally, it is possible that learning curve effects of adopting the course management system could adversely influence students' ability to cultivate cognitive presence. Recent technology-mediated management education research suggests that relatively simpler and/ or more familiar technologies may produce more significant cognitive gains in adult learners (Alavi et al., 2002), and that the learning curve associated with learning a new technology may result in frustration for newer students, or at minimum, increase the time and attention they give to interacting about the technology (Anderson, 2002; Alavi et al., 2002; Yoo et al., 2002). Considering that prior student experience with online learning was one of the strongest predictors of delivery medium satisfaction in the study, this seems to be a reasonable explanation for the lack of relationship. Also, while there is no evidence available to suggest that D2L is a more complex course management system than Blackboard, it is possible that the transition to this learning system during the study may have influenced these findings. These conditions, however, also may help to explain why social presence was the strongest CoI predictor of delivery medium satisfaction. If newer online students were trying to learn how to learn online and more experienced online students were trying to learn the course management system, expressing confusion and/ or frustration over the process of learning the technology to their group members or fellow classmates may have enhanced their social presence and even increased group cohesiveness (Williams et al., 2006). These possible explanations suggest that the relationship between social presence and delivery medium satisfaction merits further attention in future studies.

Limitations

Of course, this study's findings must be interpreted in light of its limitations. In addition to the previously mentioned issues regarding the operationalization of cognitive presence there are three that are particularly noteworthy. First, in addition to creating some new survey items to measure constructs that have not been widely operationalized, the study incorporated measures of variables developed in different research settings that have not been used together previously. This may explain why some survey items loaded on different constructs than those they were

designed to measure. Also, while variance inflation factors of the variables were quite low, it is possible that wording of these items may be capturing similar constructs when combined into a single instrument. We hope that future researchers will build upon this effort to develop measures of the CoI elements and criterion variables that are reliable, efficient, and distinct. Second, although the study helps to answer recent calls for multi-discipline, multi-semester studies in online management education (Marks et al., 2005) it is based upon the findings at a single institution. Third, the students in these courses were enrolled in the university's regular MBA program and were taking these courses along with courses in physical classrooms. This may prevent the study's findings from being generalizable to MBA programs that are offered completely online or to online undergraduate programs.

Implications

In spite of these limitations, the study carries several potential implications for management educators, management education researchers, and those with broader research interest in the CoI framework. For management educators, one clear implication is that lack of online teaching experience does not necessarily have to prevent one from becoming an effective online instructor. Novice instructors can achieve positive course outcomes by engaging students in online discussion and encouraging them to do likewise (Arbaugh, 2005b; Arbaugh & Rau, 2007; Brower, 2003). For specific tips regarding how to frame those interactions to reflect CoI principles, consulting Garrison and Anderson's (2003) recent text would be a good start.

For management education researchers, the findings suggest that the CoI framework could be a useful building block upon which to develop a theory of online management education. Developing discipline-specific theories has long been a challenge for management education researchers (Lemak, Shin, Reed, & Montgomery, 2005). While building such a theory based upon the CoI would again require management education researchers to borrow from other disciplines, they also may be able to integrate characteristics unique to the discipline such as characteristics of the course material or prior student experiences with the course concepts into such a theoretical framework (Arbaugh, 2005a; Nadkarni, 2003).

Another potentially interesting direction for management education researchers would be to test the generalizability of the CoI by examining its predictive ability in undergraduate online settings. Initial studies of the CoI framework in undergraduate business settings suggest that the nature and direction of student interaction is somewhat different between classroom and online course offerings, with students engaging each other in more frequent and higher level dialogue of longer duration in online discussions, while most classroom discussions tended to be instructor led and centered (Heckman & Annabi, 2005). However, since Heckman and Annabi's (2005) study design did not allow them to assess the relationship between CoI elements and course outcomes, this is still an area that merits additional research.

Finally, this study has implications for those interested in further study of the CoI framework. The development of a preliminary quantitative measure of cognitive presence should merit particular attention and attempts at refinement. By addressing the later stages of the critical inquiry process, the items developed to measure cognitive presence for this study help address Garrison's (2007) recent call for a "step forward" in research on this element. There are at least two possible explanations for the findings in this study pertaining to cognitive presence that merit further research. First, while some approaches to online learning research criticize using data collected after the learning experience is completed (Hodgson & Watland, 2004); such an approach may be advantageous for studying cognitive presence because it incorporates the

possibility that learners might need time to complete the higher-order phases of the critical inquiry process. Therefore, techniques typically used to assess cognitive presence such as transcript analysis (Garrison & Cleveland-Innes, 2005; Heckman & Annabi, 2005) may not completely capture the cognitive inquiry process and therefore should be supplemented with some sort of data collection at the end of the course. Second, the findings also suggest the possibility that characteristics of degree program and level of study might influence the occurrence of cognitive presence in online learning. While the nature of assignments and discussion questions provided in e-learning environments can encourage progression to higher stages of cognitive inquiry (Arnold & Ducate, 2006; Heckman & Annabi, 2005; Meyer, 2004), learner contexts also may be important in promoting inquiry. Online MBA courses targeted at students that have full-time professional positions may draw participants that can readily identify experiences to which they can apply higher level cognitive processes, where this may not be the case in learning environments such as community college or undergraduate level general education courses.

In addition to providing further quantitative verification of the CoI constructs, the comparatively large amount of unexplained variance in delivery medium satisfaction from this study suggest that CoI researchers should consider examining both the relationship of the CoI to course outcomes such as learner and/ or instructor satisfaction (Hartman, Dziuban, & Moskal, 2000; Hiltz & Shea, 2005) and the nature of the relationship between the CoI dimensions and other possible predictors of online course outcomes. For example, the items used in this study should allow for more robust testing of how the CoI elements coexist with, and/ or moderate the effects of other variables associated with online learning outcomes. Along with possibly examining relationships between the elements of the framework, some other variables that researchers should consider studying in concert with the CoI elements include the course or subject matter (Arbaugh, 2005a; Wallace, 2002), the software used to deliver the course (Arbaugh, 2005b; Martins & Kellermanns, 2004), characteristics of learners and/ or instructors (Hiltz & Shea, 2005; Peltier et al., 2007) and how the use of virtual teams might either enhance or impede the relationships between the three types of presence (Jarvenpaa & Leidner, 1999; Williams et al., 2006).

Conclusion

This paper reported on an empirical verification of the elements of the CoI framework, which found empirically distinct measures of social, cognitive, and teaching presence. The CoI framework, in turn, was found to be a significant predictor of both perceived student learning and delivery medium satisfaction in online MBA courses. These findings suggest that the CoI is a potentially powerful theoretical framework for explaining online learning effectiveness. The results of the study strongly support Garrison's (2007) recent conclusion that CoI research now needs to move beyond exploratory descriptive studies to the use of both qualitative and quantitative methods. This state of affairs presents abundant opportunities for future online learning researchers.

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Persistence of Women in Online Degree-Completion Programs

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Abstract

Although online courses at postsecondary institutions promise adults access, flexibility, and convenience, many barriers to online learning remain. This article presents findings from a qualitative case study, which explored the phenomenon of undergraduate and graduate women learners' persistence in online degree-completion programs at a college in the Northeast of the United States. Research questions asked why women learners persisted or failed to persist, and how factors supporting or hindering persistence influenced learners. Interviews with a purposeful sample of 20 participants revealed the complexity of variables affecting learners' persistence to graduation. Findings suggested that multiple responsibilities, insufficient interaction with faculty, technology, and coursework ranked highest as barriers to women's persistence. Strong motivation to complete degrees, engagement in the learning community, and appreciation for the convenience of an online degree-completion option facilitated persistence.

Keywords: online learning; adult learners; women learners; postsecondary; persistence; barriers to persistence; retention

Introduction

In the past ten years, mature (over age 40) single-parent, minority, and low-income women have become the largest group among adult learners (Peter & Horn, 2005). Career, family, and community obligations often do not allow adult women to enroll in conventional college programs. Convenient access to distance-learning courses, however, can provide them with education and/ or training.

Online courses promise learners access, flexibility, and convenience. In fall 2006, enrollment of online learners grew to about 3.5 million in the United States, a more than 21 percent growth rate since 2002 (Allen & Seaman, 2007). Although women tend to outnumber men in online courses (Kramarae, 2003), they struggle to succeed in distance-learning courses. Traditional gender divisions of labor in western nations continue to make working women the primary caregivers of children and relatives (von Prümmer, 2000). These multiple commitments in women's lives make successful completion of online courses a challenge.

Evidence suggests that retention rates in distance-learning courses in the United States are lower than in on-seat classes (Carr, 2000; Wojciechowski & Palmer, 2005). Further, the attrition rate for undergraduate online courses may be "10 to 20% higher" than for classroom-based courses

(Herbert, 2006, ¶.1). The problem is that although adult women enroll in online education in increasing numbers, educators may not understand well the factors that contribute to and inhibit their persistence (Furst-Bowe & Dittmann, 2001).

Literature Review

Persistence or retention (Tinto, 1993) can be defined as continuous or intermittent program attendance until learners reach their educational goals (i.e., the completion of a course, certificate program, or degree). According to Tinto's studies of traditional classroom institutions of higher education, the less integrated students are academically and socially, the more likely they are to depart. Building on Tinto's work, researchers have focused on other aspects of the college departure problem such as institutional characteristics, environmental influences, and motivation (Barefoot, 2004; Berger, 2001-2002; Kemp, 2002).

Many studies have addressed learner retention in online environments (Bocchi, Eastman & Swift, 2004; Moore, Bartkovich, Fetzner & Ison, 2003; Packham, Jones, Miller & Thomas, 2004; Zirkle, 2004). While some authors have focused on pre-entry learner variables such as grade point average and number of online courses previously taken (Dupin-Bryant, 2004; Morris, Wu, & Finnegan, 2005), others have studied learner needs such as the need for interaction and support (Furst-Bowe & Dittmann, 2001). Simpson (2003) examined retention strategies. Garland (1993) investigated barriers to retention and added an epistemological dimension (e.g., lack of prior content knowledge or discourse style, mismatch between learner and course expectations) to Cross' (1981) situational, institutional, and dispositional barriers that had the potential to impede adult persistence.

Most research on computer-mediated learning and retention strategies has focused on men and women without disaggregating data by gender although some studies have identified the barriers women face when they enroll in online courses (Burge, 1998; Burke, 2001; Furst-Bowe & Dittmann, 2001). Feelings of isolation, lack of family and institutional support, time limitations, and concerns for cost are among the many hurdles online women learners encounter (Furst-Bowe & Dittmann, 2001; Kramarae, 2003). Nevertheless, "few researchers have studied the ways women handle the multiple responsibilities of income provider, parent, and student" (Kramarae, 2001, p. 31), how online learning can further women's educational goals. More research is therefore needed to understand the interplay of factors that support or hinder women's completion of online courses. Educators who understand the complexity of women's balancing of diverse roles can more effectively advise and prepare women to be successful in online courses. Similarly, educational institutions that recognize women's professional, social, and academic needs are better prepared to create policies and services that address those needs.

Purpose and Context of the Study

The purpose of this qualitative case study was to gain an in-depth understanding of factors that influence women learners' persistence in undergraduate and graduate online degree-completion programs at a college in the northeastern United States. The open-admissions college serves adult learners (approx. 72 percent women, 50 percent minority, and 50 percent part-time) locally in classroom settings and at a distance in online programs. The college's degree-completion programs are for distance learners who work in public schools across the United States. The institution offers master's degree-completion programs to teachers, guidance counselors, nurses, and administrators. The bachelor's degree-completion program is designed for teacher aides.

After an initial summer residency at the college, students return home and enroll online to complete their programs.

Design of the Study

No consensus exists among researchers regarding online persistence factors (Finnegan, 2005). For this reason, this qualitative case study was an empirical inquiry that investigated the phenomenon of persistence within its real-life context of online courses (Yin, 2003). The design of the study was premised on an interpretive approach that assumed participants gave meaning to their experiences through interactions with others (Neuman, 2003). Within the broader interpretive orientation, the study's theoretical framework included distance learning models (Anderson, 2004; Berge, 2002; Huang, 2002; Kasworm, 2003; Salas, Kosarzycki, Burke, Fiore, & Stone, 2002), adult learning models (Brookfield, 1993; Freire, 1993; Knowles & Associates, 1984; Merriam, 2001; Mezirow, 2000), and Tinto's (1993) interactionalist theory of student attrition and persistence.

From a sampling frame of 308 female students who attended the summer residency in 2005, 100 were randomly selected as potential participants. The purpose of the random sample was to have a smaller pool of potential participants that represented the larger population (Creswell, 2002). The author solicited participation through an informed consent letter and follow-up phone calls.

A purposive sample of 20 female participants from among online learners was selected. "*Purposive sampling* is an acceptable kind of sampling for special situations . . . when a researcher wants to identify particular types of cases for in-depth investigation" (Neuman, 2003, p. 213). Purposive sampling does not give population validity (Stake, 1995). However, the "logic and power [of purposive sampling] . . . lie in selecting *information-rich cases* for study in depth. . . . Studying information-rich cases yields insights and in-depth understanding rather than empirical generalizations" (Patton, 2002, p. 230).

In digitally recorded phone interviews, nine undergraduate and 11 graduate students responded to open-ended questions about their experiences as online learners in the context of their professional lives and family obligations. On average, interviews lasted 45 minutes. To protect interview participants' privacy and confidentiality, the author assigned codes to individual participants (i.e., P1 and P2).

The author addressed the following research questions: Why do women learners persist in online courses? Why do they fail to persist or stop out? How do factors affect women learners' persistence?

Data Analysis

After transcription of the interviews, an open-coding process identified key words or phrases that appeared repeatedly (Strauss & Corbin, 1998). These codes were organized into families or categories. Two major code families were identified: 1) barriers to persistence and 2) factors facilitating persistence. Next, transcripts were entered into the qualitative "code-and-retrieve" software *Atlas.ti* (Miles & Huberman, 1994, p. 312), and the manually created codes were further refined. The creation of code families facilitated analysis of data and identification of themes.

Because participants were the primary sources of information, it was vital that the data reflected their responses as faithfully as possible. "In a process called 'member checking'" (Stake, 1995, p.

115), participants received a summary of the findings and the request to confirm the accuracy of the summary. Acording to Lincoln and Guba (1985), member checks are critical to "establishing [the] credibility" (p. 314) of researchers and their findings. Because participants chose not to comment on the summary of findings, the assumption is that results were as authentic a representation of participants' perspectives as possible. A lack of response, however, also points to the difficulty of obtaining feedback from participants who may hesitate to contradict the researcher's understanding of their experiences because the summary appears "*biased*; the information *conflicts* with the informant's basic values, beliefs, or self-image; . . . or this is not the way the informant *construes* . . . the same information" (Miles & Huberman, 1994, p. 276).

Findings

Respondents' experiences in their online courses were mapped against the two major code families: factors that facilitated persistence and factors that were perceived as barriers. A ranking of codes was based on the number of respondents representing each code. Table 1 displays the two code families and the ranking of the most significant code family members (see Appendix A for all codes).

Table 1. Ranking of Most Significant Codes

Facilitating Factors	Ranking	Barriers	Ranking
Engagement in learning community	17	Multiple responsibilities	15
Schedule convenience	16	Disappointment in faculty	14
Personal growth	16	Face-to-face preference	13
Peer support	14	Feeling of anxiety	12
Feeling challenged	14	Technology	12
Faculty support	13	Feeling overwhelmed	11

Note. N = 20

Overall, facilitating factors outweighed barriers to persistence. Despite obstacles to their academic progress (i.e., receiving credit for courses), interview participants found greater importance in the positive aspects of their experiences. Respondents valued being engaged in a challenging community that provided the opportunity to learn from classmates and faculty. They commented positively on their personal growth and appreciated the convenience of the college's online course option to complete their degrees.

Before taking courses online, all learners attended a summer residency at the college. Respondents preferred the face-to-face residency environment because they enjoyed the social interactions. Learning online was frequently stressful and accompanied by computer technology problems. More than half of the women felt overwhelmed by the demands of the coursework. A majority remarked on struggling to balance the multiple demands of their families and jobs. Every woman interviewed had a full-time job, and 16 had children in daycare or school. Most women reported having partners. Some partners, however, were frequently absent (e.g., in the military, engaged as a firefighter or long-distance truck driver), and others did not appear to help with children or housework.

Key Facilitators of Learner Persistence

From an analysis of the case study's data, patterns or themes emerged that revealed the complexity of factors affecting women's persistence. Being engaged in a learning community and experiencing personal growth were major themes in support of persistence. The convenience of an online degree-completion option and a variety of motivating factors were also key themes. Finally, taking advantage of support systems was a significant theme. The following sections describe the major themes and provide supporting quotations from the 20 interview participants (P1 – P20).

Engagement in Learning Community

Similar to other research findings (Anderson, 2003), results from this study showed that meaningful interaction with content, faculty, and classmates was an important aspect of respondents' learning communities. When content was relevant to their professional contexts, respondents felt interested and engaged. Research suggests that women prefer learning by forming personal connections (Belenky, Clinchy, Goldberger, & Tarule, 1986; Hayes & Flannery, 2002; Rovai & Baker, 2005). Participant 20 said:

> I learn the most from my own peers and from my professors . . . when they talk from personal experiences about the knowledge material . . . in education and things that they would use . . . We'd all share our own personal experiences about English language learners or things like that . . . I think for me, when anything becomes personal, then I really learn it.

Much of the women's sense of satisfaction came from interactions with their classmates and instructors (Herbert, 2006; Richardson & Swan, 2003). Interviewees felt positive about their asynchronous and synchronous online discussions: "It was most interesting to me, reading all my classmates' responses" (P20). Synchronous chats gave women the opportunity not only to learn but also to inquire about the lives of others whom they had met during the summer residency: "We already knew each other from the summer, so it all ended up with a little bit of what's going on in your life, which was always fun" (P14).

Feeling Challenged and Personal Growth

The themes of personal challenge and growth are consistent with Mezirow's (2000) concept of transformational learning and play a significant role in learner persistence. The online experience was new to 16 out of 20 respondents and offered unique challenges. Nevertheless, many (n = 14) found learning how to navigate an online course affirmative, and a majority (n = 16) found their increased academic and technical expertise the most valuable aspect of their experience: "I just think that . . . the one thing they say is that they know technology now like they have never known before, and so I think especially where the world is now, that that's a very valuable thing" (P20). Participant 12 concluded, "I'm able to focus more on what I'm doing online because it's not as fast paced as it would be if I was in a class . . . I think that I have changed." Participant 7 evaluated her development:

> I feel as a learner I got stronger because . . . I'm following directions from the syllabus and being graded on that, of course, but I'm able to do critical thinking.

> I'm able to research . . . to get further information, to compile my paper, so that makes me a stronger student.

Berge (2002) proposed that online learners who were able to reflect on their learning were more likely to continue with their studies. Respondents recognized that their online coursework challenged them and helped them develop their thinking. Participant 5 remarked, "[The online discussion] is . . . a learning thing . . . It's knowledge. It's stepping out of the box. It's not staying in one place. . . . The world don't stop . . . just in Georgia."

In addition to stronger analytical abilities, respondents gained independence, skills, and confidence: "You have to be disciplined in order to do online because, if not, you won't meet the deadline, because you have procrastinated, because it's not mandated to do every single day like regular going to school" (P8). "I'm not that great at written communication in teaching physics, like trying to teach through writing something down instead of talking, explaining it, and so that was good for me" (P17). "Because of this experience, I'm not so intimidated" (P1).

Schedule Flexibility and Convenience

All women had a positive experience during their summer residency. Participant 4 summarized common feelings:

> I truly enjoyed the five weeks. It was very, very intense, but each week when you finished that course, it was exhausting and exhilarating because I felt like, okay, that part is done . . . I enjoyed the weekends . . . For someone from the south who had never been to New England, it was awesome.

Despite a preference for a residential experience (Kramarae, 2001; Sullivan, 2002), respondents appreciated the convenience of online courses that met the scheduling needs of their busy lives. "I like the flexibility of working it in around my schedule . . . This night isn't good, or I have a snow storm. I'm not leaving the house. It gives me that kind of flexibility, to go ahead and still learn the content" (P19). One mother (P13) of three young children reported: "A lot of times I worked in the middle of the night, so a lot of times I posted my work at one, two in the morning."

Support from Classmates and Faculty

According to research (Anderson, 2003; Kemp, 2002; Richardson & Swan, 2003; Rovai & Baker, 2005), building social relationships with peers and instructors provides a key support system for online learners. Respondents (n = 14) ranked high in importance the relations they built with online classmates: "When I did the online, I also became a friend with someone online, so we would . . . call each other, and we would give each other support" (P11). Participant 5 found communicating with classmates informative and motivating:

> We, like, communicate real good to each other, and somebody call me and remind me: "Don't forget, girl, we got class. What you done last night? What did they say?" That's how we communicate a lot, like that. [We] still do.

Because of a family crisis, Participant 18 considered abandoning her studies. She stopped out and did not plan on re-enrolling. With a classmate's encouragement, however, she continued her courses the following term:

> I have one [classmate] that nags me to death. She will always call, and I would say, "I'm not going back. Let me call you back later." [I] guess she knew that I wasn't calling her back, but she was constantly calling, trying to get in touch with me, leaving messages.

Similar to the importance of classmates' support, instructors' availability through email, telephone, or online chat, the timeliness of their replies, as well as their words of encouragement were viewed as critical to respondents' academic success. Participant 1 found that faculty reminders made abandoning her studies not an option: "It was the reminders. You could not get away from it."

Many respondents (13) held faculty in high regard: "I want to impress my advisor because she's just that cool" (P2). "Our advisor was very responsive to us. She did get back to us in a timely fashion, and she was a cheerleader, encourager. She truly was there to help us if we needed it, so that was a very positive experience" (P19). Participant 1 commented:

> [At the local college,] they say they're geared toward adult learning, in other words, that adults had other responsibilities like full time jobs and families . . . The professors, they weren't so understanding about your life outside of their plan . . . They told you what to do, and it was almost like what we do here in public school . . . It wasn't about forming a relationship with a student to figure out the best way to get us through the program. It was about the student as a number.

Additional Facilitating Factors

Adult learners are motivated to learn when they see value in their education (Knowles, Holton & Swanson, 2005). In response to a question about the purpose of her college education, one undergraduate student who worked as a para-professional said she wanted to become a teacher. Participant 10 saw immediate financial benefits after completing her master's degree: "I went from making $36,000 to making $43,000 . . . so that was a huge jump."

The metacognitive ability to reflect on their learning helped women identify strengths that sustained them. They also used a variety of support systems (e.g., the college's technology hot line or friends):

> I'm very fortunate to have the people that I have around me because they really give me a push . . . I'm not gonna lie. Sometimes I just feel like, okay, why am I doing this? They constantly tell me, you know, just go for the goal. This is what you want to do. You can do it. (P6)

Key Barriers to Learner Persistence

Balancing multiple responsibilities was a significant theme that emerged as a potential barrier to persistence. A second theme was disappointment in faculty. Although 13 out of 20 women preferred a traditional classroom setting, having a face-to-face preference was not as important a barrier as the emotional hurdles of feeling anxious, frustrated, and overwhelmed. More than half of the interview participants (n = 12) mentioned technology problems. However, similar to all the barriers to persistence the women faced, Internet access, email, or software problems did not pose insurmountable problems.

Balancing Multiple Responsibilities

Three quarters of the study's participants referred to their struggles managing their responsibilities as parents and teachers. Similarly, Kramarae (2003) found that women often felt burdened by taking care of children and other family members at the same time as working and continuing their education online. "I am a working mother . . . [doing coursework] is a sacrifice, of course, because, you know, some Saturdays you may not be able to do it, having other chores to do" (P7). Participant 13 was overwhelmed by the demands of her young children and her work as a literacy teacher in an elementary school:

> I had a two year old, a six year old, and an eight year old. I was teaching during the day . . . Unfortunately for me, . . . I couldn't do work until ten at night, and then, really, by the time I got my kids in bed, I was just exhausted . . . The kids were in soccer as well, so it was very stressful for me . . . trying to keep them up with their work, and keep them in sports, and duties as . . . a literacy teacher: grading papers, and reading essays, and all that.

With her husband taking over some childcare duties, the mother was able to complete her degree. Nevertheless, she thought that finishing her master's degree might have been easier had her children been older. She blamed herself for not being sufficiently available to help her son in second grade pass the state's reading test and for his facing the possibility of having to repeat the grade. The mother felt guilty because her son was required to attend summer school. She persisted to degree completion, but she regretted the cost to her family. Research suggests that mothers with young children often have similar feelings of guilt when they undertake distance studies:

> What all women with families seem to have in common, though, is the apparent incompatibility of family and domestic responsibilities with serious distance education, and the need to learn to assert their right to be a student as well as a mother and housewife without feeling guilty. (von Prümmer, 2000, p. 72)

Participants struggled with family obligations and increasing professional responsibilities. Two graduate students had administrative roles in addition to being teachers: "Besides teaching in a classroom, I am a department chair. I have been involved in the last few years in curriculum writing and revision for my system" (P4). "I'm doing an administrative and supervisory course, and I'm training to be a principal" (P6). One undergraduate worked as a teacher aide and had a second job to support her family: "As para pro, we don't make what teachers make . . . I have two jobs" (P5).

Disappointment in Faculty

According to research, online learners rank faculty presence high in importance. When faculty interaction is infrequent, the rate of learner satisfaction is low (Herbert, 2006). Fourteen (n = 14) respondents found that instructors' limited communication hindered their ability to understand course expectations: "I do remember trying to hear from a professor that took a very long time. It got to the point where my classmates and I were emailing each other, 'hey, have you heard from the professor?'" (P13). "He was difficult to get a hold of. It took four or five of us trying different techniques and different times . . . We did finally get a hold of him on occasion, very late at night . . . I just really think the professors need to be responsive" (P19).

Insufficient feedback on papers diminished respondents' potential to learn: "I was back as many as five papers, yea, lots of papers . . . Some papers I never did get feedback on . . . If you write a paper and you don't get any feedback, . . . you don't know what the professor is looking for" (P14). "I was getting no response to my paper . . . and I'm like, okay, something is seriously wrong" (P18).

Though most of the women interviewed had positive experiences with instructors, they felt some instructors had low expectations: "I did have some professors who, for a lack of a better term, dumbed down the education" (P2). "I would have probably worked a little harder had there been a little more structure and expectations. I could have kicked it up a little bit more" (P4). Finally, some faculty seemed disengaged: "The professor said, 'Here is your group. Here is your topic. Here are the parameters. Go for it.'
And that was how it went" (P19).

Face-to-face Learning Environment Preference

Consistent with research (Furst-Bowe & Dittmann, 2001; Kramarae, 2001), interview participants (n = 13) found the traditional classroom setting during their residency preferable to an online context because in-class learning allowed for more social interaction and immediate feedback. Apart from regretting the absence of contextual clues of a classroom, respondents missed experiential learning activities: "I like to go through the experience . . . If you're telling me something, and then I have an example where I'm gonna actually go through the experience, I learn much better like that" (P9).

A surprising finding of this study was that a strong face-to-face preference appeared negligible when compared to other barriers. Participants did not think their preference was a significant obstacle. Feelings of frustration, anxiety, or disappointment were perceived as greater impediments to their education.

Emotional Hurdles

For 16 of the 20 respondents, taking online courses was a novel experience. At the end of their summer residency, they were apprehensive: "I hope I can get this technology to work" (P19). "I was thinking about how I would adjust taking online courses . . . managing a family . . . teaching myself, . . . having my own things going on, and having to see if online classes fit into my schedule. I was kind of iffy about that" (P3). Once enrolled in online courses, undergraduate respondents in particular found their online experience bewildering and worrying: "I was kind of confused at first…It was very stressful" (P7).

Respondents were concerned about being able to manage the demands of their online coursework and felt overwhelmed by the number of assignments, scheduling, and all the other responsibilities in their lives. Because of conflicting demands on their time, six women were unable to complete assignments on time and fell behind. Nine women reported a variety of schedule concerns: "I had one professor who attempted to have [online discussions] happen and then changed the time on three or four separate occasions, thereby making it impossible for all of us to get our schedules together" (P2). "I had to miss one or two [chats] because of meetings, or some other issue had come up, or I had to be some place, maybe a funeral or something" (P10). "We decided that we would meet on Wednesdays at nine or ten . . . but then a couple of us . . . had children, and we explained to the group that that was sort of difficult" (P13). "The only problem with the

discussions . . . is that it really never quite worked out, due to the fact of getting the right dates, the right times, and the different time zones that we're all in" (P14).

Scheduling conflicts increased some women's sense of feeling overwhelmed. 11 participants felt beleaguered:

> It was, I guess, too overwhelming when you come home and you have to decide all this stuff, and do these projects and things, and when you can't find the information. It's discouraging, you know. You got family. You got children. You got a husband. You got . . . jobs and everything. (P15)

Participant 13's doctor warned her that the stress of completing her degree endangered her health:

> Me being a parent, and when, really, to be honest, by then I was exhausted. It was to the point where the doctor told me I need to cool off before I mess around and have a heart attack or stroke, but I finished with that. I think it was more the paper part [master's thesis] that was stressing me.

For two women, feelings of stress were compounded by feelings of isolation. Others were frustrated because some classmates appeared to be passing courses even though they failed to complete assignments: "We were the first group to go . . . From there on, what was put online decreased. In fact, one other group posted . . . The other groups did not, so it really felt like we were robbed of the rest of the course content" (P19).

Technology Problems

Interview participants (n = 12) found technology to be a major challenge. The women could not always gain access to the Internet: "[The] Internet was down . . . We would shut the whole system down, and we would have to postpone . . . [our chat] for that night" (P7). They tried different strategies to circumvent the access problem by taking advantage of other people's wireless connections or by going to the public library: "The Internet is fine because I know how to go to the public library or to different places . . . to access the Internet" (P15). Participant 6 was unable to join her chat:

> I was getting blocked because I had wireless service. But at the time, the area around my school . . . did not have wireless service, so I was pretty much scurrying around, driving to different locations, just to see if I could log on to the Internet. I did not want to miss the meeting, but I ended up missing the meeting.

With persistence, most interviewees were able to gain access to the Internet. Some technical problems, however, were less well defined and therefore less easy to solve. "The first [chat], it was really hard because, I can't remember exactly what happened, but I know we were all supposed to be on at the same time, and there was something wrong with my computer" (P16). "I guess technical issues, a lot of times . . . you get into something, and you're really not sure" (P18). "Registering for the classes, that was a little problem" (P5). "I just wasn't aware how they did their thing, period, because of the different websites" (P8).

Six women lacked technical skills: "I'm not really a computer person, so I wasn't comfortable at all" (P16). One undergraduate respondent did not learn how to use the college's email system and

interrupted her studies until she could return to the following summer residency: "After I went back and checked it, I found some emails, but it was too late then" (P15).

Additional Barriers

Some women reported that they had financial issues or health problems. Other women acknowledged that they tended to procrastinate and lacked time management skills. Apart from these personal obstacles that were, to some extent, within their control, others reported that they did not obtain support from colleagues at work because they did not ask or because their colleagues seemed uninterested.

Consistent with research that has identified institutional barriers to retention (Garland, 1993; Moore et al., 2003), respondents felt frustrated by the college's administrative system, which was unfamiliar to them (e.g., the financial aid office). Participant 10 was the first in her family to go to college:

> I went through 22 people between the United States and India talking with Sally Mae, and I eventually ended up talking to somebody . . . in the financial aid office . . . They were . . . telling me that I had to do this and this . . . It was the craziest stuff, but it's the financial aid jargon . . . that the average person just has no idea what all that . . . means.

A misunderstanding of how quickly respondents would complete their programs as well as incongruence between their expectations of what they hoped to learn and the content of the courses resulted in epistemological barriers (Garland, 1993). Participant 10, a graduate student, said:

> When I first registered, they were telling us that you could take these five weeks of courses over the summer and get your master's. What they didn't tell me was that you had to have 12 transfer credits in a graduate program, which I had never established here at a local college.

Participant 15, an undergraduate student, had a similar impression that she would be able to complete her degree during the residency:

> I thought I'd come down there and do the courses and . . . graduate . . . [I was] very disappointed . . . You know, they stressed this: no children, no husband, no this, no that . . . You're coming up here to study and do this quick, and that's a piece of burden if I have to come back home and finish half of it.

Participants who had high expectations of themselves, thought some classmates were academically under prepared. Participant 14 found the quality of posted assignments inadequate: "Some of their papers were, I'm sorry to say, very lousy. They were very, very poorly done." Participant 2 was also disappointed:

> My cohort mates sent [papers that] were at times indecipherable as to what the meanings were. Punctuation was missing. Capitalization was missing. Spelling was wrong . . . I almost felt as though I were beyond what the other members of my cohort were capable of.

Participant 6 was unhappy with her classmates' technical skills: "I noticed many people who are getting a master's degree . . . still have issues with technology and still have issues with typing, just basic skills . . . To me, that's amazing."

Despite limited technical skills or academic preparation and personal or institutional barriers, all but four of the 20 women interviewed pursued their studies without interruption. Moreover, all participants agreed that the online program option suited them well, given their life situations. Every woman who participated in the interviews had a positive perspective of some parts of her online experience.

Conclusion

At the end of the study in fall 2006, 12 participants had completed their degrees (nine graduate and three undergraduate students). The remaining six undergraduate and two graduate students continued their studies. Findings suggested that variables supporting respondents' continued enrollment played a greater role than those impeding persistence. Graduate students generally seemed to take a pragmatic view of the positive and negative factors affecting their online studies. It is possible that the relative brevity of their program shaped their more positive perspective.

In contrast to graduate students, undergraduate respondents seemed to experience a higher level of appreciation and of frustration with their online courses. Because of a longer program of study, a greater number of credits attempted, more frequent stopping out, a less certain increase in salary, and state teacher licensure requirements, undergraduates may have perceived the hurdles to their persistence as greater than graduate students did. It is also possible that undergraduate students entered the open-admission institution less well prepared than graduate students and therefore found making academic progress more of a challenge.

A greater proportion of undergraduate respondents (7 out of 9) than graduate respondents (4 out of 11) felt overwhelmed by their coursework. More undergraduate women (5 out of 9) than graduate women (1 out of 11) reported falling behind in coursework. A higher proportion of undergraduate women (7 out of 9) than graduate women (5 out of 11) had computer problems and difficulty accessing the Internet. It is possible that the six undergraduate interviewees who took longer to complete their courses were not ready for the academic and technical expectations of online courses because they were either under prepared or had unrealistic expectations of themselves or the program. It is also possible that the institution did not communicate program expectations effectively and that adequate support systems were not in place to assist struggling students.

Implications

The implications of the findings for the college are that online program design should factor in the varied demands on working women's time that may cause the interruption of their studies. Modularizing courses and allowing flexible entry points could allow women to stop out and return without having to repeat already completed course work (Kazis, Callahan, Davidson, McLeod, Bosworth et al., 2007). For instance, instead of scheduling three-credit courses that run 15 weeks, some courses could be designed as shorter one-credit modules. In addition to more accommodating online delivery models, support services and faculty facilitation of courses need improvement.

According to research, adult learners tend to see themselves as customers and expect their needs to be met in a timely and customer-friendly manner (Hadfield, 2003). Women in particular favor a socio-cultural context that promotes their well-being and learning. Participants expressed strong reservations when interactions from administration or faculty were infrequent or absent. Quick responses to complaints about administrative offices (e.g., financial aid) could increase students' rate of satisfaction and alleviate the sense of isolation that some participants expressed.

Careful selection and orientation of faculty (e.g., through simulated course experiences) could result in a better understanding by instructors of the importance of meaningful interaction in online learning communities. Experienced online instructors who act as mentors could provide guidance for inexperienced faculty and improve instructional practices. Monitoring instructors' online presence could assess their effectiveness and address respondents' frustration with the perceived lack of accountability among some instructors.

To address the factor of college readiness, the open-admissions institution may need to require the diagnosis of students' basic skills (e.g., writing, computer, mathematics, and critical thinking) before course registration and offer remedial courses or technical training if necessary. Implicit in diagnostic skills assessments is the implementation of an efficient registration and advising system that tracks students' academic progress, intervenes in times of crisis, and offers academic support such as online tutoring. Finally, counseling services that respond to emotional or health issues may also meet students' need to feel socially connected not only to peers and faculty but also to staff at the institution.

Limitations of the Study

This case study was limited to a small number of participants who persisted despite difficulties and occasional stop outs. Efforts by the author to include women who had dropped out of the online programs were unsuccessful. Focusing on women only could be perceived as a limitation because women's experiences were defined as unique. Future studies may compare experiences of women and men and/ or highlight differences.

Recommendations

Women learners in higher education outnumber men (Peter & Horn, 2005). In the United States, more women than men take online courses (Kramarae, 2003). In some countries the misperception still exists that women with small children are house bound and have time for online studies (von Prümmer, 2000). In the United States, higher education providers of online programs such as the institution where there study was conducted often market to working women without necessarily taking into account that women continue to be primary caretakers of children and other family members. Gender roles are therefore an important variable to consider when designing distance education programs.

Results from this study and the literature indicate that further research is needed to investigate to what extent other factors may support or hinder online persistence of women learners who have full-time jobs, as well as family and community responsibilities. Future research could explore both institutional and demographic variables that may significantly influence women's online academic success at the college and at similar institutions. Additional research could investigate how disparities in professional and economic status affect women's ability to pursue a higher education degree online.

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APPENDIX A

Facilitating Factors

Facilitating Factors	Ranking	Facilitating Factors	Ranking
Engagement in learning community	17	Independence as a learner	11
Feeling of personal growth	16	Used support systems	8
Schedule flexibility	16	Motivation to excel academically	7
Support from classmates	14	Perception of courses as easy credit	7
Feeling challenged	14	Support from family	6
Degree as goal	13	Support from colleagues at work	6
Faculty support	13	Strong computer or writing skills	6
Faculty respect for adult learner	12	Learning applied to job	3
Metacognition: ability to reflect on learner growth	12	Career advancement or salary increase	3
Program completion opportunity	12	Role model for children	3
Enjoyment of learning	12	Study strategies to cope with family distractions	2
High regard for faculty and advisors	11		

Note. N = 20.

Barriers

Barriers	Ranking	Barriers	Ranking
Multiple responsibilities	15	Visual or auditory learning style	5
Disappointment in faculty	14	Feeling of Isolation	5
Face-to-face preference	13	Health problems	5
Feeling of anxiety	12	Lack of support from college administration	4
Technology problems	12	Lack of time management skills	4
Feeling overwhelmed by coursework	11	Financial problems	4
Feeling of frustration or Disappointment	10	Stop out	4
Schedule conflicts	9	Lack of familiarity with college technology	3
Disappointment in classmates	8	Disappointment in course expectations	3
Experiential learning style	7	High academic expectations of self	2
Falling behind in coursework	6	Lack of support from colleagues at work	1
Lack of computer or writing skills	6	Failure to seek support	1
Mismatch between learner expectations and program	6		

Note. N = 20.

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Emotional Intelligence as a Predictor for Success in Online Learning

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Abstract

As students increasingly opt for online classes, it becomes more important for administrators to predict levels of potential academic success. This study examined the intrinsic factors of emotional intelligence (EI) and personality to determine the extent to which they predict grade point average (GPA), a measure of academic success, among students attending community college. Stepwise multiple regression revealed that EI emerged as the most significant direct predictor of GPA. The addition of personality to EI significantly increased the amount of variance accounted for in GPA. Main conclusions are that soft skills are pertinent to academic success and may constitute a useful profile of the successful online student that could be applied to marketing, advisement, quality assessment, and retention efforts.

Keywords: Online student success; online learning; emotional intelligence; personality; persistence; characteristics of online learning

Introduction

Innovative delivery technologies have expanded the traditional classroom setting to distance or online learning, but whether the characteristics of students who are successful in the traditional classroom setting transfer to success in online classes is unknown. Online education has experienced astronomical growth since the 1990s (Gallagher, 2002; Perreault, 2004) although the benefits of online education do not necessarily correlate with the acquisition of knowledge (O'Malley & McCraw, 1999).

Students perceive online learning as beneficial in time saved (the ability to take more courses) so they increasingly opt for online courses, raising the question of whether student experience in the

traditional classroom provides them with the same academic readiness for online courses. In the traditional classroom setting, where learning is based on face-to-face human interaction, student success is grounded on the instructor's ability to perceive nonverbal student cues, modify instructional methods accordingly, and provide timely answers to student questions. In the online environment, face-to-face human interaction and its commensurate benefits are absent. Instead, the written word is the communication tool. Because of this difference, students' technological expertise, unmet needs for human contact, lack of self-motivation, or feelings of isolation can deter success in online courses (Hill & Rivera, *n.d.*).

Whereas identifying and resolving student characteristics that contribute to online failure prior to enrollment would enhance student success (Timmons, 2004), the literature regarding the profile of successful online learners is relatively recent and anecdotal rather than empirical (Wang & Newlin, 2000). Administrators and instructors have limited data for predicting academic success in the online format. Students have limited data for predicting whether online learning is appropriate for them. The ability to broadly profile the students most likely to succeed in the online environment would focus marketing, advisement, and retention efforts.

Learning is as much a function of a person's emotional response to a learning environment as it is to the instructional method or classroom (Flood, 2003). The success of online students, however, has been primarily investigated in terms of student ease with computer technology or satisfaction with the program rather than intrinsic characteristics such as self-directedness, self-motivation, emotional self-regulation, or persistence (Gallagher, 2002). Moreover, emotional characteristics that have been linked to online success include persistent effort, internal locus of control, and self-efficacy (Albritton, 2003; Holcomb, King, & Brown, 2004; Irizarry, 2002; Kemp, 2002; Parker, 2003; Wang & Newlin, 2000).

These emotional predictors of online success correspond with emotional intelligence (EI). EI is self-awareness of one's own feelings and needs, the ability to label them accurately, and to merge them with personal long-term goals as well as the needs and feelings of others in the current social situation (Jerabek, 1998). It predicts success in school and business beyond traditional indicators of academic intelligence and personality (Van der Zee, Thijs, & Schakel, 2002). EI predicts academic success in traditional classrooms and serves as a transitional tool to the corporate world (Barchard, 2003; Goldsworthy, 2000; Parker, Summerfeldt, Hogan, & Majeski, 2004). In the corporate world, the EI that characterizes successful leaders is reflected in their self-awareness, self-management, and relationship building for everyday problem-solving and communication (Goleman, 1995). In addition to emotional predictors of online success, EI is positively correlated with age (Goleman, 1998); Bar-On (2006) found that older groups (age 40+) scored significantly higher on EI than younger groups.

Despite its contributions to success in other venues, there has been little investigation into the construct of EI as a predictor for success in the online environment (Imel, 2003). As distance education continues to play a greater role in higher education, the challenge is to explore the possible relationship between online learning and EI (Imel, 2003). We measured EI in the current study. The following section broadly reviews the connection between online student characteristics and EI and personality.

Online learning requires student and instructor preparation that is distinct from the traditional classroom; both the student and the academic institution need to be cognizant of this difference (American Center for the Study of Distance Education [ACSDE], 1999). Success in online courses is probably a combination of technical, personal, cognitive, motivational, and psychological factors. Computer literacy, reading and writing skills, and effective written

communication certainly contribute to online success (Buchanan, 1999). Online students must also supply the motivation to succeed in online classes without face-to-face human interaction. Successful students need to be able to monitor their own learning and progress, garner peer support, exercise good time management skills, and draw on experience to find resources on the Internet (Blocher, De Montes, Willis, & Tucker, 2002; ACSDE, 1999). Online success is further predicted by several self-regulatory functions including effective self-management, emotional self-regulation, self-generated motivation, self-efficacy, persistence, and an internal locus of control (Bocchi, Eastman, & Swift, 2004; Buchanan, 1999; Draves, 2000; Liu & Ginther, 1999; Wang & Newlin, 2000). Factors that reduce online success include a student's educational background (Wang & Newlin, 2000), and lack of written communication and/ or time management skills in combination with unrealistic online course expectations (Timmons, 2004).

Learning theory views intellectual intelligence and emotion as polar opposites (O'Regan, 2003, ¶1; Imel, 2003) despite the fact that "…effective learning is much more a function of the emotional response to a learning environment than the techniques and structures on which it is based" (Flood, 2003, Pedagogy, ¶1). People differ in their emotional responses to situations. Adult learners in particular have a need to be emotionally comfortable with the learning situation for learning to take place (Draves, 2000). Online learning elicits frustration, anxiety, apprehension, and incompetence as well as excitement and pride in what one has accomplished (O'Regan, 2003). Certain emotional competencies are necessary for learning to take place: Individuals must control negative emotions like fear, anxiety, and frustration so that positive emotions like enthusiasm and a sense of accomplishment can increase (O'Regan, 2003). Attending to emotions in the classroom enables both student and instructor to manage feelings and provides useful methods to address difficulties that could deter success (Gates, 2000).

Affective domains (interpersonal skills, coping skills, emotional responses) are slowly melding into traditional and online learning instructional designs (Goldsworthy, 2000; O'Regan, 2003). EI can be taught and integrated into the curriculum (Tucker, Sojka, Barone, & McCarthy, 2000). Goldsworthy (2000) integrated EI into online instructional approaches by designing online educational materials for personal emotional skills that maintain motivation, self-confidence, and team work when people feel overwhelmed.

Persistence in a post secondary academic institution is loosely defined as the tendency to stay in school and finish a degree program (Summers, 2003, ¶3). It is influenced by many factors (Dellana, Collins, & West, 2000; House, 2001; Reynolds & Weagley, 2003; Richards & Ridley, 1997; Summers, 2003; Ziegler, Bain, Bell, McCallum, & Brian, *n.d.*). Personal dimensions include age, gender, ethnicity, financial constraints, academic background, and responsibilities to work and home. Associated emotional dimensions or psychographics (Irani, Telg, Scherler, & Harrington, 2003) include self-belief and attendance. Academic dimensions include clarity of educational goals, reasons for choosing the degree program or major, course availability, scheduling convenience, satisfaction with instruction, grade point average (GPA), computer proficiency and comfort, and choice of online or traditional classroom courses.

Persistence (measured as student progress or motivation to continue with a degree program) has also been investigated as resilience, defined as coping behaviors when faced with stresses or setbacks, life events, and external commitments (Kemp, 2002). Successful completers had high levels of resilience in establishing and maintaining healthy relationships, ethical standards, willingness to take risks for beliefs, mastery of self in a social environment, and the persistence to work through difficult situations with self-confidence (Kemp, 2002). As a dimension of EI, we measured resilience in the current study to examine its theoretical relationship with EI.

Personality type is predictive of academic success in traditional classrooms, but few data are available about personality and online success, so we included personality in the study. In traditional classrooms, personality corresponds to course perception (Daughenbaugh, Ensminger, Frederick, & Surry, 2002; Irani et al., 2003). In particular, the personality traits of achievement, dominance, and exhibitionism predict traditional classroom performance (Fagan & Squitiera, 2002; Lufi, Parish-Plass, & Cohen, 2003; Rothstein, Paunonen, Rush, & King, 1994). Specifically, Rothstein and colleagues (1994) found that achievement correlates directly with conscientiousness, exhibitionism with extroversion, and dominance occurs across all Big Five Factors of personality (extroversion, neuroticism, agreeableness, conscientiousness, and openness to experience). Academic success among first-year law students is directly correlated with self-confidence, self-esteem, previous achievements, independent thinking, and ambition (Fagan & Squitiera, 2002). Extroverts prefer online instruction (Daughenbaugh et al., 2002).

Our primary research question was whether EI is a predictor of GPA.

Method

Participants

The study sample was drawn from a mixed student population of Caucasian, African American, Hispanic, Asian, and Middle Eastern ethnic groups attending a two-year technical community college. Age ranged from 18-57 years. Since the college has an open door policy (all applicants are accepted), the population ranged widely in academic readiness from remedial to advanced. Students who were enrolled for spring and fall semesters in 2005 had the option of selecting from 40 online courses. Online courses were developmental (pre-college math or English) or normal curriculum serving the Arts and Sciences; Business, Industrial, and Engineering Technology; Health and Human Services; and Transitional Studies (remedial/ developmental) degree programs.

Materials

Three instruments provided through http://www.psychtests.com (a research initiative of http://www.queendom.com) were used to measure EI, personality, and resilience. Reliability, criterion validity, and construct validity have been established on all tests through a random selection of a pool of 150,000 men and women aged 10 to 80 who took the tests on the http://www.queendom.com website. Cronbach's Alpha (r = .88), Spearman-Brown's split half technique (r = .88), and Guttman's split half technique (r = .88) all revealed high reliability coefficients for the EI survey. Cronbach's Alpha (r = .85), Spearman-Brown's split half technique (r = .81), and Guttman's split half technique (r = .79) all revealed high reliability coefficients for the resilience survey. The Assessment of Character Traits Profile (ACT-personality test) reports are based on percentiles. Raw scores for the subscales were used to generate descriptive statistics and to evaluate the reliability and validity of the profile. Cronbach's Alphas were provided for each subscale, range r = .70 to r = .82, and indicated high reliability coefficients for the personality survey. Psychometric reports are available by request.

The EI survey (EI-Q abridged) consisted of 17 self-assessment and situational questions that measured overall EI and the perception of self and others (see http://hr.psychtests.com/archprofile/stats/eiq_abridged.pdf). It measured the ability to recognize and label personal feelings and needs, and to reconcile those needs with personal long-term goals and the needs of other people (Jerabek, 1998, p. 1). Scores are reported as an overall general EI

score scaled from 50-150. Average EI is a score of 100, low EI is below 75, and high EI is over 115; the greater the score, the higher the EI.

Resilience was calculated with a survey of 25 situational items measuring the ability to cope with and recover from minor stressors and difficult life events in relation to age, stress, and life setbacks (St. Jean, Tidman, & Jerabek, 2001). These data were collected to compare to EI scores. Scores are reported as overall resilience on a scale from 0-100 with 50 as a midpoint. The greater the points, the greater the resilience (see http://hr.psychtests.com/archprofile/stats/resilience.pdf).

The personality survey (ACT) (Warren, 2002) used 64 Likert-type scaled items to assess (a) helpfulness, (b) sociability, (c) need for approval, (d) dependence, (e) tension, (f) rigidity, (g) need for control, (h) competitiveness, (i) conscientiousness, (j) achievement, and (k) tendency to be innovative. These data were collapsed into six clusters – traits emerged when instrument was developed as delineated on the scoring guide provided by the publisher: (1) sociability [i.e., helpfulness and sociability], (2) external locus of control [i.e., need for approval and dependence], (3) tension [i.e., tension], (4) aggressiveness [i.e., rigidity and need for control], (5) persuasiveness [i.e., competitiveness and conscientiousness], and (6) achievement [i.e., achievement and tendency to be innovative]. Cluster scores (personality traits) ranged from 0-100. Scores were reported as an overall score and scores on each of the subscales. The higher the cluster score, the more the person exhibited the associated characteristic. In this study, personality traits were analyzed as percents of total personality score. The trait with the highest percent was used to classify personality. Traits were alphabetized and coded 1-6 for analysis. Students who scored 75 percent or higher on more than one trait were coded as a 7.

In addition to measures of EI, resilience, and personality, data were also collected on age, gender, number of completed online courses (as a measure of previous online experience), program of study, number of semesters completed, and GPA. Age and gender were open fields on the survey. Number of semesters completed was measured from 0-7 (e.g., 0 was scored if the participant was in their first term at the school). GPA was measured on a scale from below 2.0 to 4.0, broken down in the mid range of each grade (i.e., low C average 2.0 - 2.4, high C average 2.5-2.9, etc. to 4.0). GPA was self-reported.

Design and Procedure

We used an inter-correlational research design to examine the relationship between online success (GPA) as the dependent variable and the above variables as independent (predictor) variables.

During a mandatory orientation session held at the beginning of the spring 2005 semester, procedures and expectations of participants were explained, and online students were invited to volunteer to participate in the study. A letter of consent explaining the purpose of the study, risks and benefits, confidentiality measures, participation guidelines, and contact information was emailed to 30 online faculty members to obtain their permission to solicit student volunteers for the study. The letter was then emailed to students through the college email system and posted on the *WebCT* announcement page with a disclaimer indicating that a student should not access the assessments more than once. The letter explained that clicking on the link to the assessment website (see http://www.psychtests.com) constituted informed consent and an agreement to participate.

Once informed consent was obtained, students accessed the link with a user name and password. Confidentiality was maintained by having students use their student identification (ID) numbers

or randomly generated terms or numbers. Data were stored in an online repository and only available to the authors through a secure user name and password for 6 months after data collection. Data were gathered and aggregated through an individual identification number or the Individual Service Provider (ISP, unique identifiers of each computer). Students were instructed to complete all three online instruments during one 30 - 45 min testing period at their convenience within a two-week period identified in the letter.

Students were compensated for participating in the study in several ways. Online, completion of each instrument was immediately followed with feedback of the total score. Participants then received personalized advice on how to improve their EI and resilience based on their scores. Finally, participants received in-depth narratives that interpreted the impact of their most prominent personality traits on academic achievement. Some faculty provided extra credit or replacement of a test grade; students submitted their scores and a paragraph on self-knowledge gained from study participation.

Data for the analysis were provided by participants who completed all three instruments. If a participant took the assessment more than once, only data on the first time (indicated by time and date stamps) were included in analysis.

Significance was set at $p = .05$. Inferential tests were two-tailed unless otherwise indicated. Two tests were conducted to determine if we could combine spring and fall data: an independent *t* test of EI and a chi-square test of independence for GPA. Demographic variables were examined for normalcy (resemblance to the normal curve) with frequency distributions. Scattergrams of all bivariate correlations were examined for linearity; all were linear. A Pearson intercorrelation table was generated and inspected to determine the strength of correlations for entry into a stepwise multiple regression analysis; only variables that significantly influence the dependent variable should be entered into the regression. Stepwise regression was used because the statistical computer software determines the order in which independent variables become part of the regression equation; entry is based on the strength of bivariate correlation coefficients (largest coefficients are entered first). The regression equation was generated to predict the value of the dependent variable (GPA) based on a constant (intercept; value of Y when $X = 0$ where Y is the dependent variable and X is the independent variable) and regression coefficients (relative weights) for each independent variable. We ran *t* tests to test the hypothesis that the slope (b) of the regression line equals zero, which would indicate the regression was no more predictive than the mean of the dependent variable. Beta weights, which are standardized regression coefficients, are included because they are metric-free and illustrate the magnitude and direction of the relationship between GPA and each independent predictor variable.

Results

The independent *t* test showed EI data from spring and fall did not differ significantly, $t(111) = 0.43$, $p = .67$, 95% CI -4.46, 6.89, spring $M = 107.95$, $SD = 14.75$, $SEM = 1.63$, $n = 76$; fall $M = 106.73$, $SD = 14.36$, $SEM = 2.36$, $n = 37$. The chi-square test showed that the distribution of students across GPA categories did not differ from chance, $X^2(4,90) = 9.12$, *ns*. Based on these findings, data from the two semesters were combined for analysis.

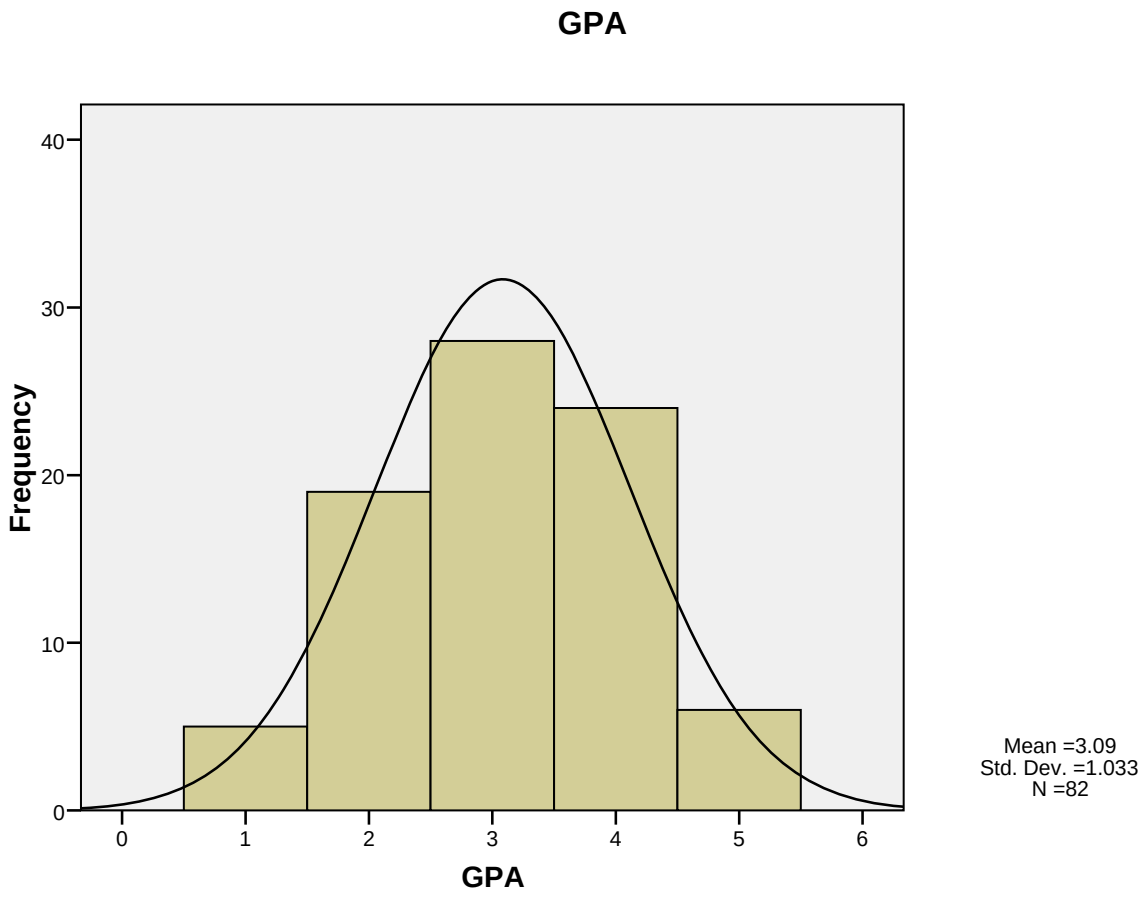
Of 359 registered online students, 272 participated in the study. Only participants who completed all three assessments (EI, resilience, and personality) were included in this analysis. Just less than half of the 272 participants (42%, $n = 113$) completed all three assessments. Of these 113 participants, 19 students were eliminated from analysis because they were currently in their first

online class, leaving a total of 82 students in the current analysis. Of the remaining 159 out of 272 participants, 23 percent (n = 62) supplied personality data only, 17 percent (n = 45) supplied EI data only, 14 percent (n = 39) supplied resilience data only, 3 percent (n = 8) completed just the resilience and EI surveys and 2 percent (n = 5) completed just the personality and EI surveys.

The 82 participants were adult learners aged 18-57 years (M = 29.7 years, SD = 9.5, Mdn = 28, Mode = 20, skew = 1.00). The majority were female (81%, female n = 66; males 19%, n = 16).

Students were about evenly divided between being relatively new and fairly experienced with online courses. About half of the students had completed one (23%, n = 26) or two (26%, n = 21) online courses (Mdn = 2 courses). Remaining students had completed three, four, or five or more online classes (13%, 21%, and 9% respectively). Of the 78 students who supplied information on the number of semesters completed, which gives an idea of the overall experience they had with college courses, the median number was three semesters completed (Mode = 2, range 1-7 semesters); 75 percent had completed less than five semesters.

Figure 1. Distribution of Grade Point Average Overlain with the Normal Curve



GPA data were collected as one of six categories with interval limits of half a GPA number level (e.g., category 3 = 2.5-2.9, category 4 = 3.0-3.4, etc., on a 4.0 point scale where 4.0 = straight A

average). Figure 1 shows that GPA data adhered closely to the normal curve (*Mdn* = 3, Mode = 3, where category 3 was the GPA interval of 2.5-2.9 (a high C average), skew = 0.11. No student reported a 4.0 as their GPA (category 6).

The possible range of the EI scale was 50-150. Student participants ranged a smaller fraction of that, 69-133, *M* = 107.2, *SD* = 14.7, *Mdn* = 108, with an acceptable skew, -.40. For resilience, the possible range was 0-100. Resilience scores averaged well above midrange, *M* = 73.5, *SD* = 12.1, actual range 41-91, with a minimally acceptable skew, -.98.

There were seven possible personality classes. Six were characterized with one outstanding trait. The seventh category was a catch-all category for students who were characterized by 2 or more traits. The modal personality rating was sociable (26%, *n* = 21), followed by 2 or more traits (24%, *n* = 20). A comparable percentage of students were characterized as being tense (13%, *n* = 11) or aggressive (11%, *n* = 9), having an achievement orientation (12%, *n* = 10) or external locus of control (10%, *n* = 8). The final 4 percent (*n* = 3) were characterized as persuasive.

Table 1. Inter-correlations between Variables and Grade Point Average

	Personality Code	Emotional Intelligence Raw Score	Resilience Raw Score	Gender	Age	Number of Semesters Completed	Online Course Experience
GPA	.257(*)	.325(**)	.252(*)	-.114	.328(**)	.221	.281(*)
Personality Code	1	-.018	-.126	-.062	.157	.123	.254(*)
Emotional Intelligence Raw Score	-	1	.673(**)	.026	.247(*)	.020	.005
Resilience Raw Score	-	-	1	-.031	.187	-.116	-.109
Gender (dummy coded)	-	-	-	1	.071	-.078	.051
Age	-	-	-	-	1	.234(*)	.264(*)
Number of Semesters Completed	-	-	-	-	-	1	.290(*)

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).
For correlations between number of semesters completed and other variables, *n* = 78.

Table 1 shows the inter-correlations between the variables. Row 1 of Table 1 shows that, of the possible independent variables, all but gender and number of semesters completed correlated with the hypothesized dependent variable, GPA. Independent variables in multiple regression should be correlated with the dependent variable, but not with one another, a condition known as multi-collinearity, as correlated independent variables add nothing further to the ability of the regression line to predict the dependent variable. Specifically, EI was significantly correlated with resilience, $r(80) = .67$, $p < .01$, and age, $r(80) = .25$, $p < .05$. Age was also correlated with the number of semesters completed, $r(80) = .23$, $p < .05$, and the number of online courses

completed, $r(80) = .26$, $p < .05$. Because correlations between the other independent variables were non-significant, multi-collinearity was not a concern. To avoid the problems of multi-collinearity among correlated independent variables, a stepwise multiple regression was performed with EI and personality as the independent variables and GPA as the dependent variable, to determine if they were significant predictors of GPA. The un-standardized multiple regression formula, $F(2, 79) = 8.53$, $p = .00$, multiple $R = .42$, was

$$\text{Predicted GPA} = 0.61 + 0.024(\text{EI}) + 0.17(\text{personality})$$

At the first step of the model, EI entered the equation and accounted for 11 percent of the variance in GPA ($R = .33$). EI was directly related to GPA, indicating that high EI scores were related to higher GPA scores. At the second step in the regression, personality entered the equation. By adding the independent variable personality to the equation, the variance in GPA accounted for (R^2) increased significantly, F change (1, 79) = 6.91, $p = .01$, $SEE = .95$. The combination of EI and personality accounted for 18 percent of the variance in GPA (adjusted R^2 = 16%).

While the un-standardized regression coefficients appear small, they were both significant in a null test of the slope H_0: $b = 0$; EI $t(80) = 3.27$, $p = .00$, 95% CI .009, .038; personality $t(80) = 2.63$, $p = .01$, 95% CI .028, .204 where b = slope of the regression line. Note that the 95 percent of CI values frame the un-standardized regression coefficients .024 and 0.17, not raw EI scores or personality codes. Beta (β) weights are standardized z scores (possible range 0-1) that, because they are metric-free, show the relative contribution of EI and personality, respectively (β = .334, β = .268).

To determine the association between GPA and EI, we did a chi-square test of independence. GPA data were collected as a nominal variable with 6 levels; since no student reported a GPA of 4.0, the 6th GPA category was excluded, and only 5 levels of GPA were used. To create nominal categories from the continuous variable EI, we created high and low EI groups with a median split and compared frequencies of students across the 5 GPA levels. Results allowed us to reject the no differences null hypothesis, X^2 (4, 82) = 16.43, $p < .005$. There were no significant adjusted residuals. Visual examination of the data showed that the two middle GPA categories (high C and low B) held the biggest differences between observed and expected frequencies. In the low EI group, there were more students in the C range and fewer in the B range than expected by chance. The opposite occurred in the high EI group, which included fewer students in the C range and more in the B range than expected.

To determine the association between GPA and personality, we did a chi-square test of independence. Too many cells had expected frequencies of less than 5 (88%) so GPA was collapsed into two levels, 2.9 or less and 3.0 or more. The hypothesis that GPA was significantly associated with personality type was supported, $X^2(6, 89) = 20.10$, $p < .01$. Table 2 shows that there were almost twice as many low GPA students as expected whose personalities were characterized as having an external locus of control or being predominantly tense or aggressive.

Table 2. Association between Personality Type and Grade Point Average

GPA Level	Observed	Expected	Dominant Personality Trait
Low	5	8.73	Sociable
Low	6	3.33	External Locus of Control*
Low	8	4.57	Tense*
Low	6	3.33	Aggressive*
Low	4	2.91	Persuasive
Low	2	4.99	Achievement
Low	6	9.15	2+ Major Traits
High	16	12.27	Sociable
High	2	4.67	External Locus of Control
High	3	6.43	Tense
High	2	4.67	Aggressive
High	3	4.09	Persuasive
High	10	7.01	Achievement
High	16	12.85	2+ Major Traits

Low = GPA of 2.9 or less. High=GPA of 3.0 or higher.
* Observed frequencies twice the size of expected frequencies.

Theory predicts that there is not an association between personality and EI, but we were able to reject the null hypothesis of H_0: μ - μ = 0. A one-way ANOVA indicated there were significant differences in EI across personality types, $F(6, 76) = 2.39$, $p = .03$. Table 3 lists the personality types in descending order of magnitude and shows that sociable, achievement oriented, and persuasive individuals had the highest mean EI scores, whereas tense and aggressive individuals had the lowest mean EI scores. Tukey post hoc comparisons showed that students whose personalities were characterized as sociable (who had the highest mean EI score) were significantly higher than students characterized with tense personalities (who had the lowest mean EI score). Correspondent to this finding, a higher percentage of sociable students reported higher GPAs than did tense students. The breakdown is as follows: Both sociable and tense students were modal for the high C category (2.5 to 2.9 on the 4-point scale); 33 percent of the sociable students and 45 percent of the tense students. Some 29 percent of sociable students were below this GPA level, whereas 37 percent of the tense students were below it. Sociable students, however, were actually bimodal for GPA. Another 33 percent reported GPAs ranging from 3.0 to 3.5 (low B category). Altogether, 38 percent of the sociable students reported GPAs higher than the high C range, whereas only 18 percent of tense students did.

Table 3. Descriptive Statistics of Emotional Intelligence (EI) Scores across Personality Types

Personality Type	N	Mean	SD	SE	95% CI Lower Limit	95% CI Upper Limit
Sociability	21	113.71	9.85	2.15	109.23	118.20
Achievement Oriented	10	111.30	11.63	3.68	102.98	119.62
Persuasive	3	111.00	7.00	4.04	93.61	128.39
2+ Major Traits Indicated	21	108.33	19.19	4.19	99.60	117.07
External Locus of Control	8	101.88	14.85	5.25	89.46	114.29
Aggressive	9	100.56	11.86	3.95	91.44	109.68
Tension	11	97.36	12.86	3.88	88.72	106.01

An independent *t* test indicated that there was no difference in EI between male and female participants, t (80) = 0.24, p = .81, males M = 106.44 EI raw score, SD = 17.62, SEM = 4.40, n = 16; females M = 107.42, SD = 14.09, SEM = 1.72, n = 66. Males showed greater inconsistency in EI, however. There did not appear to be sex gender difference in GPA x Gender, $X^2(4, 82) = 6.92$, p = .14, although adjusted residuals indicated there were significantly more males in the GPA category of high C range of 2.5 to 2.9, observed 9, expected 5, z = 2.3, and fewer females, observed 19, expected 23, z = 2.3.

Discussion

The main finding of this study was that EI was the primary predictor of academic success in online courses, but the combination of EI and personality served as a stronger predictor of online student academic success. EI was directly associated with GPA among online students. Higher grades corresponded to greater levels of EI. The implication is that soft skills like EI and certain predominant personality characteristics may be closely related to students' academic success in online courses, whereas others may be contraindicated.

The profile of a successful online student that emerged from this investigation could be used in advisement, marketing, and retention efforts. Administrators interested in identifying students with the greatest probability of online success might consider generating student profiles for advisors' use. Validated assessments of EI and personality traits may present an efficient and non-threatening way of helping students and their institutions determine whether or not online

courses are appropriate for them. Among the students in this study who did not complete all three surveys, most either completed the personality or EI tests. This suggests that students may be less resistant to personality and EI surveys than other forms of assessment. In addition, EI can be taught, which substantiates the need for students to develop self-awareness prior to enrolling (Tucker et al., 2000). This can be accomplished through a required online orientation course that not only teaches technical skills but also teaches self-awareness skills.

Conceptually, our results are consistent with previous descriptions of emotionally intelligent individuals (Albritton, 2003; Holcomb et al., 2004; Irizarry, 2002). Sociability was the personality trait that emerged as most closely associated with online success. Sociable individuals were characterized as helpful and outgoing. This fits with the characterization of emotionally intelligent individuals as having a strong ability to establish and maintain healthy relationships (Goleman, 1995) while regulating their own emotions (Gallagher, 2002) as they take risks for their beliefs (Kemp, 2002). Other personality factors that are intuitively and demonstrably associated with academic success, such as achievement and persuasiveness, were also associated with above average EI mean scores. Achievement-oriented individuals were characterized as innovative and highly motivated to achieve, whereas persuasive individuals were competitive and conscientious. On the other hand, tense and aggressive individuals and those with an external locus of control reported average or below average EI scores (Table 3). Tension is related to a number of factors, whereas aggressiveness in this study was associated with rigidity and the need for control. Those with an external locus of control have a particular need for approval. All these latter factors appear to militate against success in the online environment where time-delayed written communication is the mode of interaction. Table 2 shows that there were more than twice as many individuals characterized as tense, aggressive, or externally controlled in the lower levels of GPA than in the higher levels.

The persistence of emotionally intelligent individuals is attributed to an internal locus of control and self-efficacy (Holcomb et al., 2004; Irizarry, 2002; Parker, 2003; Wang & Newlin, 2000), as well as resilience. Resilience is the ability to cope successfully with stresses or setbacks, the willingness to take risks for one's beliefs, and the self-confidence to master the self in a difficult social environment. The challenge of the online environment is to cope successfully with the lack of immediate faculty feedback and face-to-face contact between student and faculty.

An important result of our study was that resilience was strongly and directly associated with EI but did not, in itself, predict GPA. This finding supports the theoretical link between resilience and EI where resilience is viewed as a dimension subsumed under the broader construct of EI as effective self-awareness. EI is the awareness of one's own feelings and the ability to accurately label and merge them with the needs and feelings of others in the current social situation (Jerabek, 1998). This finding provides indirect support for Kemp's (2002) finding that successful completers (of degree programs) displayed high levels of resilience.

The direct correlation between EI and age was consistent with Goleman (1998) and Bar-On (2006) who reported a positive correlation between EI and age. That is, the older the participants, the greater their emotional intelligence. Age was also correlated with the number of online courses taken by participants. Intuitively, this may explain the length of time students have been enrolled. It is another finding that needs further study. Our sample demographics were consistent with Halsne and Gatta's (2002) description of the typical community college population although they included a portion of displaced older workers as well. Participants were generally average-to-good students; most were 20-30 years old and female. About half were new to the college.

As distance education continues to grow, a more research-based approach to student assessment for online courses may improve the success of online courses for students, instructors, marketers, and academic institutions. With a greater understanding of how distance learners think and learn, and how EI and personality correspond to academic success online, educators may be able to design better-fitting online courses and better advise students on courses to take. In terms of distance education, these findings may indicate a need to look at the distance education course-advisement process more closely. The data, however, should be interpreted with caution as they were based on a small sample of two semesters from a single college, and all data were self-reported.

In conclusion, the triangulation between personality traits, EI, and GPA merits further investigation. The present study provides a basis for the profile of the emotionally intelligent student. Future research should look at larger samples (balanced between males and females) of more experienced students from multiple universities (including degree ranges from associates through doctoral). Methodological improvements include counterbalancing the presentation of the three assessments to control for order effects. When extra-credit incentives are used, students should provide appropriate documentation to prove that the assessments were taken. This would probably produce a larger number of respondents who complete all three assessments. Further research could investigate the correspondence between online instructors' EI and personality, and their students' EI and personality. To the extent that these constructs play a significant role in online success of students, it would be important to measure the same characteristics in instructors.

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Eportfolios: From description to analysis

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Abstract

In recent years, different professional and academic settings have been increasingly utilizing ePortfolios to serve multiple purposes from recruitment to evaluation. This paper analyzes ePortfolios created by graduate students at a Canadian university. Demonstrated is how students' constructions can, and should, be more than a simple compilation of artifacts. Examined is an online learning environment whereby we shared knowledge, supported one another in knowledge construction, developed collective expertise, and engaged in progressive discourse. In our analysis of the portfolios, we focused on reflection and deepening understanding of learning. We discussed students' use of metaphors and hypertexts as means of making cognitive connections. We found that when students understood technological tools and how to use them to substantiate their thinking processes and to engage the readers/ viewers, their ePortfolios were richer and more complex in their illustrations of learning. With more experience and further analysis of exemplars of existing portfolios, students became more nuanced in their organization of their ePortfolios, reflecting the messages they conveyed. Metaphors and hypertexts became useful vehicles to move away from linearity and chronology to new organizational modes that better illustrated students' cognitive processes. In such a community of inquiry, developed within an online learning space, the instructor and peers had an important role in enhancing reflection through scaffolding. We conclude the paper with a call to explore the interactions between viewer/ reader and the materials presented in portfolios as part of learning occasions.

Keywords: Online learning community; hypertext; metaphor as learning tool; ePortfolio; cognition; scaffolding

Introduction

In recent years different professional and academic settings have been increasingly utilizing ePortfolios to serve multiple purposes from recruitment to evaluation. Definitions for ePortfolios range from a collection of artifacts, a method to capture development of ideas and learning, to a forum to interact within professional communities. An ePortfolio is often defined as "a digitized collection of artifacts, including demonstrations, resources and accomplishments that represent an individual, group, community, organization, or institution. This collection can be comprised of text-based, graphic or multimedia elements archived on a Web site or on other electronic media" (Lorenzo & Ittelson, 2005, p. 3). Campbell, Cignetti, Melenyzer, Nettles and Wyman (2006) highlight the systematic and organizational aspects of ePortfolios. Helen Barrett (2007) suggests that ePortfolios ought to include, reflection, engagement and assessment for learning (see http://electronicportfolios.org/blog/index.html). Barrett emphasizes the key role reflection plays

in the construction and substance of an ePortfolio, and therefore invites those who construct and teach how to use ePortfolios to include tools for scaffolding reflection: blogs, wikis, and digital stories. In a 2005 workshop at The University of British Columbia (UBC) entitled, *Outside the Course Box: Digital Portfolios as New Spaces for Learning*, Kathleen Blake Yancey, Clemson University, highlighted the importance of "linking" as a learning tool that is central to the construction of ePortfolios. Yancey argues that when students make explicit connections between various bodies of knowledge, they demonstrate learning. She wonders about the kinds of cognitive links that occur through the use of ePortfolios. She explores the possible unique connections between electronic linking within ePortfolios and cognitive linking.

This paper reports on the ways in which graduate students discussed, described, and analyzed their learning in the context of the construction of an ePortfolio for the culmination of studies in a Masters in Educational Technology (MET) program at the University of British Columbia. We[1] were particularly interested in the ways in which students moved from a description of what they had learned, to an analytical discussion of how they had learned. We were intrigued by the supports necessary, and the steps taken, to encourage students to move from description to analysis.

This research was set to explore the ways in which ePortfolios become tools to enhance reflection. Specifically, we analyzed ePortfolios in terms of the use of hypertexts and metaphors as tools to demonstrate students' deepening understanding and learning.

We organized this paper around the key themes of our analysis. We conclude the paper with suggestions for teaching, as well as offering some comments about metaphors, hypertexuality, and scaffolding as important cognitive tools for online learning.

Background

Participants

The research reported here is based on the analysis of ePortfolios, which had been constructed as a part of an elective course, ETEC 590 (most often taken as the last course) in the MET program. The course had been taught four times and the data collected for this paper was based on the consent of 22 students (n =17 males; n = 5 females) who agreed to have their materials analyzed for this paper and their ePortfolios posted as examples for new students taking the course. The course has gone through major revisions based on students' feedback and the analysis that had been the basis for this paper. ETEC 590 is an online course which includes course content materials, group discussion forums posted on the course website, and a blog. Strategies for peer and instructor feedback are built into the course at various points. The major task for each student taking the course is to construct an ePortfolio.

Data Collection and Methods of Analysis

We were engaged in an ongoing, qualitative, self-study that focused on enhancing reflection through the use of ePortfolios in an online course. Students enrolled in the course were also invited to participate in the research (i.e., they provided consent for us to analyze their various contributions within the course). Data for this research were students' engagements in the small

[1] Gabriella Minnes Brandes is the instructor in the course discussed in the paper and Natasha Boskic is the instructional designer for the course. They have been collaborating since the initial steps of offering the course and throughout the years it has been taught.

and large group discussions, their final ePortfolios, and the live oral presentations of their work. These were systematically analyzed to understand the multiple ways in which ePortfolios provided students with structures, tools, and opportunities for reflection.

Preliminary analysis occurred at the end of each round of teaching the course, which led to modifications within the course. Students' comments and initial analysis of the ePortfolios informed our understandings of ways to use ePortfolios to enhance student learning. After the second time the course was taught, and once we obtained Ethics approval and students' consent, we began a more systematic analysis of online discussions and the ePortfolios students created.

In our analysis of the ePortfolios, we move beyond examination of the organizational schemes of the portfolios to a deeper exploration of how they worked as vehicles for reflection. We established patterns and themes, highlighted anomalies and inconsistencies, and compared our findings with the theoretical framework we developed. Analyzed were the ways students used metaphors and hypertexts as opportunities to demonstrate learning. Systematically analyzed were the connections between online tools students used and their reflection on their own learning.

Theoretical Framework: Reflection, metaphor and hypertext

Reflection

Moon (2001) links reflection to learning as she discusses "surface" and "deep" approaches to learning. A "surface" approach involves memorization of details whereas a "deep" approach involves the integration of the new materials into existing knowledge, and the reconsideration of prior knowledge in light of new information. Moon suggests stages of representation of learning that highlight varying levels of depth of reflection. The stages move from noticing, to making sense, to making meaning and working with meaning and transformative learning. Clearly, the last three stages involve "deep" reflection. As a part of the learning activity, learners begin to develop a holistic view of what is learned – that is, more than the details included in the initial steps of memorization and accumulation of information. Learners link ideas to other ideas, construct relationships with prior knowledge, and provide evidence of restructuring ideas and evaluating the learning process. The construction of the ePortfolio provides students with a structure, which scaffolds a move into the stages of "deep" learning as students review their learning.

Metaphors: "Metaphor … is common to all our experiences and integral part of our daily life" MC

Metaphors are an integral part of the language we use. They carry our perspective, point of view, assumptions, and conceptualizations of what it is that we are trying to understand or convey. Metaphors reflect different ways of approaching tasks (Collins & Green, 1990). They highlight and coherently organize some aspects of our experience, and de-emphasize other aspects within the same experience (Marshall, 1988). Marshall analyzes different metaphors used to describe learning settings and compares working in recreational environments as metaphors to explore classroom learning. Marshall suggests that we carefully consider the metaphors we use so that we are aware of the benefits and limitations that they impose. Sfard (1998) argues that in order to reveal the most fundamental levels of thinking about how we learn, we need to expose and explore the metaphors we use when discussing learning. She identifies two metaphors: acquisition and participation. Sfard argues that metaphors allow us to "elicit some of the fundamental assumptions, underlying both our theorizing on learning and our practice" (p. 4).

She asserts that metaphors are a tool for understanding; they are "a means for explaining the processes that turn old into new" (p. 4). Metaphors can enhance learning through the connections between the old and new, but can also limit the view of the new in light of the old. Martinez, Sauleda and Huber (2001) concur with Sfard's analysis of the role of metaphors in theorizing and discussing learning. They analyze metaphors pre-service teachers use as they describe learning. Most teachers in their study used transmission of knowledge as their key metaphor, whereas some used constructivist metaphors. Few teachers conceived of teaching and learning as a social process, however.

Hypertextuality: "Education is not linear … a whole network of systems to support the delivery" TI

Constructivism and new theories of knowledge acquisition focus on student-centered practice where learning is characterized as an exploratory process building on student's prior knowledge, personal capabilities, interests, and preferences. Digital environments enable non-hierarchical, non-chronological, multi layered acquisition and utilization of knowledge (Chanen, 2007; Dobson & Willinsky, 2007; Ensslin, 2004; Johnson-Eilola, & Kimme Hea, 2003; Landow, 1997; Manovich, 2001). The networked way of thinking is supported by the hyper-linear electronic structure of the Web. Bolter (2001) points out that the "World Wide Web reflects 'multiple and developing' relationships between pieces of information" (p. 98). Banerjee (2004) argues that a reader of hypertext dismisses the boundaries of time and space to be in communication with different text. The human mind often works in non-linear associations, but there is also a need for coherence so that ideas are accessible and understandable (Schneider, 2005; Tyrkkö, 2007). Rose (2000) takes a more critical stand on the impact of hypertextuality. It is interesting to explore the relations between ideas established in hypertextual environment, and whether hyper linking breaks the natural flow of ideas, or it actually infuses a progression towards more complex structures. Numerous studies explore learner behaviour in digital spaces. Calisir and Gurel (2003) claim that a hypertextual structure increases "knowledgeable" participants' performance with respect to reading comprehension, while "non-knowledgeable" participants feel more comfortable in the linear text (Potelle & Rouet, 2003; Rouet, 2003). Gardner (2003) wonders whether technology imposes impulsiveness, or it promotes critical thinking. Dillon and Gabbard (1998) question readers' response to hypermedia and their comprehension across media. How much control does a writer have in hypermedia environments over what the reader/viewer would glean from the materials posted? We analyzed our data with these questions in mind.

Analysis

From Description to Analysis: Metaphors

Participants were asked to find metaphors that will highlight their understanding of teaching, learning, and the use of technology. Primarily they used metaphors that were embedded in a constructivist theory of teaching and learning.

Table 1. Participants, selected metaphors and context

Student	Metaphor	Title	Context
Winter 2006			
SH	Environment and culture	Technology and tradition	North-West territories
DK	In a state of continual becoming	Learning as a state of continual becoming: Past, present, forward	Project Manager eLearning Academy, Croatia
CM	Open space	Science, technology and rural education	High-school teacher. Rural area, B.C.
GP	Ecological metaphor	Ecologies of knowledge	Junior-high school teacher
SR	Journey	Trails through a learning landscape	College instructor, Yukon
MS	Learning as transformation	Radical transformations	Transition from corporate to education sector
Fall 2006			
GC	Highway	Route 06	K-5 teacher, Southern Vancouver Island
DC	The island of knowledge	Capstone Island	General Tech class teacher, Alberta
RF	Putting the cart before the horse	Keeping the horse where it belongs	High-school physics teacher
JG	Quest	Yellow-brick road – A journey in eLearning	Grades 5-7 teacher Northern BC
GP	Bridges	Bridging the knowledge gap	BCIT, Vancouver
NS	Set of tools/Tool shed	Shed filled with tools	Behaviour intervention program, English teacher, B.C. outside the Lower Mainland
PS	Exploration	Mathematics in a sea of technology	High-school Math teacher, Vancouver
CT	Learning as transformation	Learning as vision and light	Community college instructor, business, technology, Vancouver
Summer 2007			
BB	Connection	Connection: An educational ePortfolio	Grades 3-6 teacher, French Immersion, B.C.
DB	Workshop	Doug's workshop	High-school Electronics, Mechanics and Art Metal teacher rural B.C.
SB	Pendulum	Education as a transformative tool. Balance in life and teaching	Inner city school
MC	Thread	Thread: Epistemology, Technology & Practice	Adult education, Alberta

TI	Delivery tour	edEx – Education Express	High-school teacher, Business education, Vancouver
MM	Climbing	Reaching for higher ground	High-school history teacher, and U of T, Ontario
GT	Through the hoop and down the rabbit hole - transformation	Through the hoop and down the rabbit hole	High-school teacher, Physics, Math and Science, Vancouver
MW	Flower garden of learning	Knowledge in bloom	High-school Computer/Information Technology teacher First Nations students, Vancouver Island

Eight of the 22 participants used variations on the ***journey*** metaphor where the traveler went through changes throughout the journey, and often the destination changed, as well as the traveler. Seven focused on the ***transformative element***s of learning, and some related these transformations to gardening and growth. Five were inspired by their ***contexts*** and focused on learning within a ***community*** and ***making connections***. Two used the overarching metaphor of the ***skills and tools*** needed for learning.

Students' metaphors are discussed in detail and then general conclusions are drawn on the use of metaphors to describe teaching as a way to illustrate deepening levels of understanding. In some cases students' metaphors encompassed more than one idea. For example, CT used the metaphor of learning as light, but she also examined the tools needed for learning. BB used the metaphor of community, but also highlighted connections within that community.

Using Technology for Learning: A journey

Many described their learning in the MET program as a journey. JG connected his metaphor to *The Wizard of Oz* as his learning took him on a journey on the *Yellow Brick Road*. GP likened his journey to crossing bridges; GC. described riding on highways and smaller roads; DC's journey took him to an island; and PS entitled his ePortfolio *Mathematics in the sea of technology*. TI was inspired by *FedEx* and entitled his portfolio *EdEx*, suggesting the fast pace of the journey and the move of information.

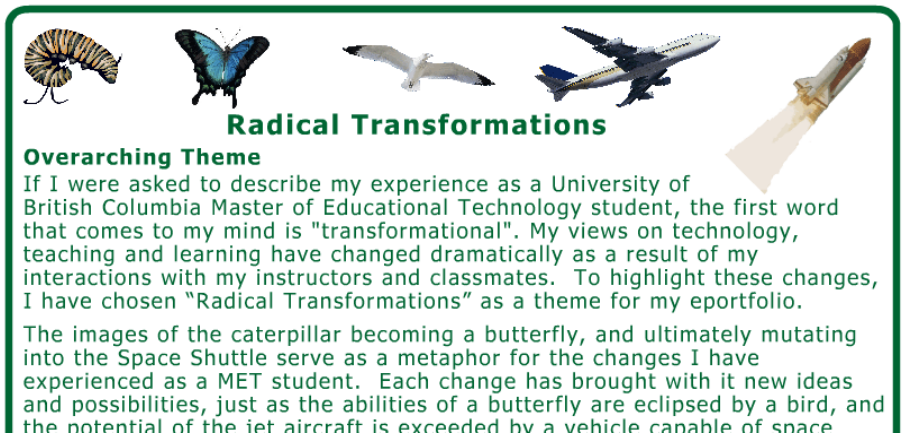
SR's title for her ePortfolio was: *Trails through a learning landscape.* When she described the structure of the portfolio and the various sections it included, SR wrote: "I chose the Inuit trail marker, the Inukshuk, to indicate the beginnings of new trails through my learning landscape. The trails are not isolated and may cross each other, but they are intended to act as 'advance organizers' to help others to understand the progress of my learning throughout the MET program in a coherent way." SR provided a visual map for the portfolio and explained that navigating through the site was a journey in itself.

Using Technology for Learning: A transformation

NS, MS, and CT used the metaphor of learning as a transformation. MM constructed his portfolio around mountain climbing, as he discussed his own growth and transformation when he climbed mountains and compared it to the completion of his graduate program. DK's and MS's metaphor was change, transformation, and growth. DK wrote about continual becoming, and MS explored ideas of "radical transformation".

MS used a set of images to describe the process of transformation: a caterpillar to butterfly, seagull, airplane, and shuttle (Figure 1). Some transformations were not a natural maturation and growth process (evolutions), but rather a 'forced' metamorphosis – bird to airplane and shuttle. MS used a word "mutating" to express the "radical transformation". We knew from his biographical pieces, that MS decided to make a change in his career and move from business and technology areas into social sciences and learning. His belief in behaviourist approach started shaking under the influences of constructivist theories he encountered in the MET program, particularly as he examined the social implications of technology. Although it may look that MS's metaphors were too strong to relate to his learning experience, one may wonder about his interpretation of being radical.

Figure 1. Visual representation of transformation (Monte's ePortfolio)



DK had undergone a similar transformation moving from an administrative and managerial job towards teaching. She saw her learning experience as a time-line of continual growth. DK did not use images to represent this process, but she successfully implemented a colour spectrum, allowing colours to sink into each other (rotate) with every change of different sections in her ePortfolio, and in that way she visually represented her own transformation.

In the most current offering of the course, GT used the metaphor *Through the hoop and down the rabbit hole*. He explained his reference to Lewis Carroll's *Alice in Wonderland*. "In wonderland, you need to be willing to re-examine some of your most fundamental assumptions, and I thought the same thing applied to the MET program about how to communicate effectively as well as what constitutes good pedagogy".

Choosing a Metaphor that Reflects One's Context

As students grappled with choosing their overarching question or metaphor to capture their learning and describe the influence of technology on teaching and learning, they often drew upon their own contexts and experiences. SH, SR, and CM were looking into their environments as they chose the metaphors and visuals for their portfolios. Although SR did not explicitly discuss context, she entitled the portfolio: *Trails through a learning landscape*, and she chose a visual representation and a metaphor that reminded her of her physical northern landscape. SR's context and landscape shaped her perceptions, worldview, and the representation she used.

CM chose a notion of "open spaces" to talk about her learning. Her focus was on rural education and her metaphor was seen in the images of rural areas that she picked to 'decorate' specific sections of ePortfolio. SH went one step further, to explain how culture was embedded into environment. She explored the traditions of Tlicho Dene people, and applied the same principles of their creation story to her own "internal context". SH's ePortfolio was one example of the links between the external landscape and the metaphors used. She used the creation story of Tlicho Dene people to describe the construction of the ePortfolio, entitled *Powerful allies for building educational resilience in Tlicho youth*, which discussed multi-literacies and technology in a particular context. SH used traditional stories that carried traditional wisdom to highlight and introduce each section of the portfolio.

> In the Dene Creation story, the original people began by deciding the essentials they needed and tied these essentials together in bundles. I chose to do the same. As my plan is to continue to develop and evolve this ePortfolio, I began by choosing the essentials and then I bundled these essentials together into common themes.

By reflecting on their personal experience of the MET program through the lenses of a metaphor, students were 'forced' to look back on their learning and life not only as a collection of various artifacts, but as evidence of their constant growth, a mirror of their beliefs, cultural values and, oftentimes, teaching perspectives. A selection of a metaphor was therefore not an easy task. On the contrary, for some, coming to a clear, meaningful, and focused representative word or image was mind-boggling, and sometimes painful. The final choice demonstrated and determined their personal contexts, both internal and external.

When we compared the metaphors students used to those Martinez and colleagues (2001) analyzed, our students did not have a surface level, transmission-oriented view of learning. They shared a constructivist paradigm, which led to view of learning as a transaction or a transformation. This difference could be explained in two ways. First, Martinez and colleagues analyzed pre-service teachers, while our participants were all experienced teachers working on their Masters degree. Secondly, the MET program is steeped in a constructivist paradigm, which is interwoven into many of the courses and therefore influences the ways in which our students viewed teaching and learning.

Using Technology for Learning: Creating a community

Different students emphasized that learning was done within a community and a context. Relying on their experiences in the MET program, they described how working with peers by exploring ideas in small and large groups, had shaped their understanding. One student highlighted the function of open source tools to encourage sharing ideas and teaching materials within a community. BB discussed relationships between people as a key element in teaching and learning. His portfolio traced a move from the personal to the professional, sociological, and cognitive aspects of learning as BB highlighted interpersonal connections and learning within a community. The starting point for the exploration in his ePortfolio was a particular belief about the importance of meaningful social interactions between young people and adults. This worldview (inspired by a book written by Gordon Neufeld) led BB to an analysis of technology and the use of technology in schools in light of questions of making interpersonal connections.

Having been influenced by Vygotsky's work on learning, MC chose the metaphor of intertwining threads and interconnectedness. MC invited us to look both at the individual and the social

construction of knowledge. He argued that the ways in which teachers used technology was a reflection of what they thought about learning. The metaphor of the intertwining threads was an image that was used as the background and backdrop for learning. The text and visual representations of weaving and sewing helped pull his portfolio together.

Using Technology for Learning: A set of tools

When NS discussed the teachers' role when using technology, he used the metaphor of having a set of tools choosing appropriate tools for different tasks. He said: "There is always a best tool to get a job done, and so, as teachers, we must have access to a variety of tools. Good teachers recognize when a tool is good enough to get a job done well, and do not always rely upon the flashiest, most impressive tool available." DB, a high school electronics, mechanics and art metal teacher, chose the metaphor of his "own workshop and its tools." As he discussed the use of technology in teaching, NS's view was complex. He encouraged teachers to use new technologies, new "tools", but cautioned from using tools just for their innovative qualities. He added:

> Teachers should not be afraid of technology. Just because a tool is simple, does not mean that it is best. We cannot prepare students for the world of tomorrow by exclusively using yesterday's tools. Only by knowing the tools of our trade, which includes using them in a variety of ways, do we learn what works.

From Description to Analysis: Using hypertexts

Preparing to become competent and efficient users of technology, students applied their newly acquired knowledge throughout the program. The ePortfolio, being the culminating project, became the structure to represent what they had learned. Students chose a variety of tools to present their artifacts.[2] They used their personal experiences and worldviews as they constructed interactive and compelling webpages in their portfolios. They wanted their content to be informative and engaging, and at the same time, showcase their individualities and their cognitive and emotional involvement in the process of their learning. The process of developing a digital narrative by its nature includes hypertextuality (Bolter, & Grusin, 1999). The relationships created by linking one piece of text to another added new layers to students' work. Students had to make critical decisions about what tools to use to present their ePortfolio; to anticipate the impact of their choices on the substantive nature of the portfolio and the audience's reception of their products. These decisions were analyzed to highlight the thinking processes that evolved throughout the course, and the links between the construction of ePortfolio and students' deepening understanding of their own learning.

Investigated was how students made connections between various parts of ePortfolios, and how they employed hyperlinks and how those hyperlinks supported the content of each portfolio. Did students use hyperlinks in order to offer additional information, enhance understanding with a personal insight, or simply because the technology enabled making connections to other external sources (i.e., text, visual or audio)? We were seeking evidence "how thought itself was reshaped

[2] In the first offering of the course, we presented three choices to students: i*Webfolio, Took Kit* and *WebCT. Student Presentation Tool*, some providing predetermined templates whereas others left more space for individual decisions. Since all students chose not to use templates we stopped presenting these options and students had free reign and choice in the tools they used.

through interaction with the new modalities of wiring and language" (Calleja, & Schwager, 2004, p.3) in students' ePortfolios and in their discussion in the forums.

Some students decided to develop simple webpages, while others chose more complex links (i.e., blogs, wikis, *Flash* templates). For the majority, the choices made required a lot of learning about technology and its effects. One of the required components of the ePortfolio course was a "tour guide" and a site-map where students explored and explicitly explained to the audience their considerations in the construction of the ePortfolio, its organization, components, and inter-relations.

One of the basic functions of hyperlinks is to enable readers to move from one page to another. Some participants in our research did not go beyond that, offering one or maximum two layers of depth. Everything that was part of a website was visible from the homepage, or from its branches, as in GP's and CT's ePortfolios. Exceptions were sections called "links" or "resources" wherein the reference lists contained external links to journal articles or websites. There was no hyperlinking inside the content of the portfolio. In this manner, the individual who constructed the portfolio could control the readers'/viewers' navigation patterns easily and keep them focused. It was difficult to say, though, whether that was the writer's intention, or there were other reasons for not having nodes inside the content – i.e., staying closer to print-based writing practices.

Other students, however, used hypertexts in more complex ways. DK, for example, had links going to four different destinations: 1) to one of the ePortfolio pages (navigation, as with GP and CT); 2) to a wiki, which was a working and drafting space; 3) to a blog, which served as her journal that recorded her learning experiences through the MET program; and finally 4) to external resources for further exploration.

SH, on the other hand, used links primarily to connect one piece of her writing to another, explaining terms, sharing her experience, and discussing her research. She had a limited number of occasions where her links took the reader outside of her ePortfolio, connecting to external resources (websites or articles). Since all the links connected to various aspects of the portfolio, there was less possibility to have 'dead links' after a certain period of time, as it had happened with CM's ePortfolio where a number of links to external sites were broken after a year.

Some students, as NS and CM, for example, used hyperlinks for a variety of purposes, linking to both internal and external sources, providing information or in-depth analysis. Hypertextuality and the use of metaphors served to support students' messages. They pushed students' thinking further, created opportunities to explore and create links, and enhanced "deep surface" learning.

From Description to Analysis: Metaphors and hypertexts combined

Hypertextuality is one tool that technology provides to illustrate deeper thinking through making explicit connections between ideas. Hypertexts provide technical, visual, and substantive ways to link ideas and make apparent connections between concepts. Similarly, metaphors are the second tool analyzed in this paper to demonstrate synthesis. Even when students used commonly held metaphors about learning, those metaphors had unique flavours. The medium of ePortfolios had hyperlinks that invited students to elaborate and illustrate the metaphors. In the most current group of students (Figure 2), since the instructor had been clearer on the connections between the use of links, hyperlinks and metaphors, students explored these ideas in depth. Their use of the language of metaphor provided a lens to explore learning and often shaped their decisions in

construction of the portfolio and the use of hypertexts. Michael said: "Metaphor is a cognitive tool to draw connections, to connect concepts in an abstract way". Slavko did not organize the artifacts in the chronological order of taking the courses in the program, but organized the portfolio in a way that highlighted his metaphor. The pendulum became the substantive and organizational tool that has led the hyperlinks in the portfolio.

Figure 2. A collage of ePortfolios from Summer 2007

A different way in which the metaphors and hyperlinks were connected was demonstrated in DB's ePortfolio. He used visual tools (and the sidebar) to introduce each section. All those visuals and tools linked well to the overarching metaphor of learning as making choices of the appropriate tools within a workshop.

A sophisticated and elaborated juxtaposition of the metaphor and hypertextuality was in MC's portfolio. To emphasize learning as making connections, MC used the visual representation of threads. All visuals were needle/ thread related and appeared as sidebars, and at the top of the page for each section. MC moved beyond just using visual representations of threads as he used the language of sewing in his discussions of the artifacts:

> In designing instructional materials, the complexity of the learner, the content and the learning situation must be considered. To tie in the thread metaphor, naturally dyed organic cotton thread has its value as does 100% Polyester. While it may not be the perfect solution, when it comes to learning theory I prefer the cotton/poly blend." "…Like in fashion, as the seasons change, the preference of different coloured thread will also change. It is not always easy to predict what the next trend will be.

The language of sewing created a cohesive portfolio. All discussions, reflections, and summaries in MC's portfolio were woven with the one organizing theme. It had become a lens through which MC analyzed teaching and learning. The reflection sections were woven into the reflective narratives, and were not always hyperlinked and had become an integral part of the portfolio.

ePortfolio organization

Analysis of students' portfolios suggested that their approach to organizing their artifacts had evolved over time. Every new "generation" had, thanks to the generosity of previous ones, a growing pool of ePortfolio examples to learn from. In the first two course offerings, most students chose to organize their ePortfolio either by presenting artifacts in relation to individual courses, or by ordering them chronologically as they were developed throughout the program. By critiquing previous portfolios, and with instructor's guidance directed to other organizational choices, students chose to organize their portfolios around a metaphor, an overarching theme, or a question. These became the lens through which students explored their learning in the ePortfolio. The shift in organization was evident in students' navigation choices. While in the first offering, most ePortfolios were organized by the required elements (as taught in the course), the rationale, assessment rubric, teaching philosophy, courses, electives, reflections, the following offerings of the course already provided a change. Some students took liberties and reflected on their learning by organizing the artifacts around a metaphor, as suggested in the course content. The sections in GP's ePortfolio, which was organized around the metaphor of a bridge, were: Preparation, Foundations, Framework, and Spanning the Gap. The visuals in his portfolio also related to bridges. JG's *Yellow brick road: A journey in eLearning*, included the following titles to the various pages: *Beginning*, *Off to be the Wizard*, the *Emerald City*, *Encounters with Oz*, and *Ruby Slippers*. In the latest offering of the course, SB, BB, and MC, among others, organized their ePortfolios around themes, which shaped the content, language, and visuals. With an enhanced focus on possibilities for the organization of the portfolios, and a concerted effort to use metaphors and hypertexts as organizational mechanisms students' portfolios became more sophisticated and multi-layered.

Teaching How to Move from Description to Analysis: Scaffolding

Instructors have a key role to play when students are called upon to construct ePortfolios to enhance deep reflection and analyze what they learned. Matthews-DeNatale (2007), in a keynote address entitled *ePortfolios in Action: An Evolving Learning Landscape*, frames and describes the learning that occurs as students construct portfolios. She uses the metaphor of a construction of stories. Leaning on Mary Catherine Bateson's notions from her book *Composing A Life* (1989) Matthews-DeNatale argues that we learn through telling our stories as we piece together disconnected elements. This process calls for reflection and analysis that comes through the organization and reorganization of different artifacts. She asserts that stories can be seen as product, process, and cycle. We agree with Matthews-DeNatale that ePortfolios provide a tool and structure for students to document events, research, ideas, reflect, and analyze these ideas, use the analysis to inform the next steps, and then share their ideas with others.

In our experience, peer and instructor's feedback, as well as various scaffolding tasks that are built into the construction of the ePortfolio, all contribute to the move from description to analysis. In this section, examples of these scaffolding tasks are provided to illustrate how those helped students towards deeper engagement with the artifacts. Initially, students framed their portfolios and set-up structures that would allow integration of various components of the ePortfolio.

Framing could be done through a set of over-arching questions, values, or metaphors, which interweave the artifacts and create a meta-analysis structure that shapes the ePortfolio. (Course materials, week 4)

Key questions in the course content and weekly tasks serve to scaffold student learning. One scaffolding task was the analysis of exemplars of portfolios, which provided students with language and examples of metaphors to think about their own portfolios, and tools that they could use to create them.

A third form of scaffolding occurred through online dialogue and instructor feedback. Each student submitted a proposal for the portfolio and received feedback from the instructor and a peer. Following is an example of the ways in which the instructor's feedback on the proposal provided a scaffold for a student, who was encouraged to move deeper in the analysis.

MW wrote his purpose for the portfolio in his proposal: "[To] create an organized document that shows off my learning …connect my learning together for further reflection". MW chose the metaphor of a flower garden. The instructor's feedback to the proposal was:

> I was curious about the metaphor of the flowers in the garden. How does it shape your understanding of learning and teaching? What role does technology play in it? At the moment, it seems that you approach the portfolio as a compilation of artifacts. It is clear what you want included in the portfolio but not why you chose these artifacts and how they connect to one another and to a broader (more general and theoretical) question.
>
> You make one comment about learning and deep reflection and that is about the role of time. How does this comment shape your understanding of teaching and learning? What differentiates "deep reflection" from any other reflection?

In response to the instructor's comments and questions, MW replied:

> Thank you for your comments and feedback. Your comments are very helpful.
>
> Presented below are some additional thoughts based on your feedback.
> Knowledge in bloom – The garden metaphor is used to represent the complexities that are involved in the use of technology in educational environments. The flowers that will be included in my ePortfolio symbolize the many different issues that exist with technological use in an educational environment. The goal will be to link technological issues, which will be supported by artifacts with possible solutions that can act to provide guidance for other educators who may be struggling with the same issues. By providing possible solutions for complex issues surrounding technology, it is my hope that I can help others to provide a rich learning environment through which teachers can watch their student's knowledge bloom.

The dialogue between MW and the instructor continued with the instructor's reply:

> I appreciated the continued dialogue and your clarification about the use of technology. You allude to some issues that arise from the use of technology in educational settings and you could clarify here what you mean. Once you clarify what kinds of issues or challenges you are referring to then the solutions would become more contextualized and relevant.
>
> Consider further in what ways the metaphor of garden and knowledge blooming – enhance how you define and determine learning. What are the pre-requisites? To

> use your metaphor – what is the water and how is it supplied? What fertilizer is used? Who decided how the garden in planted and tended for? What is the sun? soil?

Through that dialogue, MW shaped ideas about the construction of the portfolio:

> The ideas that you mention such as the sun, soil and fertilizer are exactly what I have in mind. In addition, I plan to include a weed list to be symbolic of items that encroach upon educational technology such as acronym-based language.

As a result of that dialogue, MW was able to discuss specific examples and problems from his teaching practice in terms of the overarching metaphor he chose.

Peers also played an important part in scaffolding. In the last week of the course, each student presented the ePortfolio to the group, and during a question-answer period that followed, probed one another and asked for further clarification. As students replied to their peers' questions they considered new aspects of their organization, structure, and metaphor. These discussions often led to the final revisions of the ePortfolios.

Conclusions

Our goal, as instructor and designer, has been to support students in their engagement in knowledge building as they use technology to support learning (Scardamalia & Bereiter, 2003). In our online learning environment, we developed and sustained a community of inquiry (Brandes & Erickson, 1998, Erickson et al, 2005) whereby we shared knowledge, supported one another in knowledge construction, developed collective expertise, and engaged in progressive discourse. As students critiqued and analyzed the ePortfolios, they explored the ways in which these were constructed and how they matched their stated objectives and goals. Students developed criteria for evaluation of portfolios, which they could in turn use to assess their own work and that of their peers.

When students understand technological tools and how to use them, their ePortfolios are richer, more complex in the ways in which they illustrate learning. Metaphors and hypertexts become useful vehicles to move away from linearity and chronology towards new organizational modes that better illustrate students' cognitive processes. In such a community of inquiry that is developed within online learning spaces, the instructor and peers have an important role in enhancing reflection. They provide scaffolding necessary to move from description to analysis within a safe environment.

Martinez and colleagues (2001) call for professional development activities and, particularly, conversations that highlight construction and analysis of metaphors teachers use. This paper analyzed various opportunities for such dialogues. In our experience students asked one another primarily questions of clarification. Peers' questions and queries often led to new thoughts and further clarifications within the portfolios. The instructor carried the main responsibility for scaffolding through probes, challenges, and critiques that led students to think beyond what they had done. Perhaps because in online spaces these discussions are transparent and mostly done in the public spaces, students have more opportunities to learn how to probe and critique both their own and colleagues work. Instructor and students share a new language of the knowledge that is constructed through those discussions and enhances learning.

As ePortfolios are used more, we must consider the ways in which their structures and organization reflect their messages. We must explore the different technologies available that will highlight the ideas explored in the portfolios. We must consider viewing the ePortfolios as learning opportunities for the students who construct them, as well as those who view them. We encourage research into the interaction between viewers/readers and the materials presented in the portfolio. We suggest providing different venues for reflection through analytical examinations of exemplars of ePortfolios, discussions of choices of tools, as well as opening spaces for explorations of new ideas and media. We encourage educators to use metaphors and hypertexts, as well as other ways, to enhance deeper reflection that shapes ePortfolios so that they are not just the compilation of artifacts, but occasions for learning.

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Instructional Strategies in Teaching Engineering at a Distance: Faculty Perspective

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Abstract

This paper presents research on a convenience sample of the Open University of Sri Lanka's engineering faculty. Examined in this research are faculty's opinions on the instructional strategies they use to teach engineering courses at a distance. First, this paper details the pedagogical strategies used by the faculty, which is then followed by an overview of faculty's opinions on the strengths and weaknesses of engineering courses offered by the Open University of Sri Lanka. Recommendations are given to improve the overall effectiveness of the engineering courses. It is anticipated the adoption of these recommendations will result in greater student competency and lower drop-out rates.

Keywords: Distance learning; engineering; instructional strategy; Sri Lanka

Introduction

The abstract nature of engineering makes this subject difficult to teach in any educational environment, and more so at a distance. Teaching engineering at a distance by its inherent nature introduces additional challenges. Engineering education typically requires students to have physical knowledge that only lab activities and hands-on experiences can provide (Da Silveira, Da Silva & Térsio, 1999).

The Faculty of Engineering Technology of the Open University of Sri Lanka (OUSL) has been offering distance education courses in engineering for 20 years. The blended learning system used by OUSL's Faculty of Engineering Technology is based on multimedia instructional materials, with strong emphasis placed on distance education using printed material and audio-visual aids. Self directed study is the central theme of study at OUSL; students are typically provided print-based learning materials in lieu of attending conventional face-to-face university lectures. These print-based learning materials provide students with learning activities and self-assessments in the form of questions designed to help them develop independent study and analytical skills. At OUSL, print-based study materials are supported by audio-visual learning materials, attendance at day schools (i.e., face-to-face tutorials), consultation sessions, laboratory work, field work, and seminars. Laboratory work and field work, which are both compulsory components, form an integral part of OUSL's engineering technology programme. While attending the day schools, OUSL students are encouraged to discuss difficulties they may have encountered in the self study materials. In recent years, limited Web-based support has been provided for some courses within

OUSL's engineering programme. Most students, however, lack access to the Internet (and web-based learning) so this form of learning support is not compulsory for this programme. Indeed, only students with access to the Internet are able to utilize this form of student and learning support.

OUSL's Faculty of Engineering Technology's curriculum enables students to structure their coursework to meet their individual learning needs and lifestyle. All programmes are designed to lead to a recognized degree qualification. Depending on the courses selected and credit hours earned, OUSL's students are then awarded the diploma or degree with specialization in a particular field of study (e.g., civil engineering).

OUSL's engineering programmes comprise a number of courses, all which fall into distinct sub-topics of study such as: industrial courses, general courses, computer literacy, English, management, training, engineering courses, engineering projects, and mathematics. Each course is assigned a 'Level' ranging between zero (0) and seven (7). Each course in a programme of study is assessed separately. Assessments consist of two components: continuous assessment and the final examination. Learning activities, such as laboratory work, field classes, assignments, presentations, mini projects, and assessments in the form of tests and examinations, comprise the components of continuous assessment of OUSL's engineering programme. In this programme, continuous assessment is one of the more important means of facilitating learning and for monitoring students' progress. The final grade point received for a given course of study depends solely on students' performance which, as noted, is based on continuous assessment and the results of the final examination.

Rationale for the Current Study

Much comparative research has been done examining the effectiveness of various instructional strategies used by distance education institutions, such as the effectiveness of a given delivery system or technology versus another. In most literature, comparative studies examining delivery systems in distance education report no significant differences in learning (Hoyte & Frye, 1972; Chu & Schramm, 1975; Whittington, 1987; Bacon & Jakovich, 2001). According to Dillon, Hengst and Zoller (1991), however, these "comparison studies" generally find either no significant differences in learning or significant differences in favor of the distance students. Some studies suggest that the technology used to support instruction typically has little influence on student learning outcomes (Johnson & Aragon, 2003). Factors, such as the unique attributes of the technology (Denton & Clark, 1985), the type of learning outcome desired, or the method used (Dillon & Strohmeyer, 1991) are rarely investigated, however. The question our research seeks to answer is not whether to use technology per say, but rather how best to use it (Chu & Schramm, 1975).

OUSL's Faculty of Engineering Technology is, in many respects, a true pioneer, in that OUSL is one of the first open and distance learning universities in the world to offer engineering programmes at a distance. OUSL's Faculty of Engineering Technology has incorporated many instructional strategies in its engineering courses offered at a distance, and *on the surface*, OUSL appears to have been rather successful in producing many graduates and diploma holders in the field of engineering sciences (note: OUSL's diploma programme is an entry point to a full degree). It is not enough, however, to simply *appear* to be successful. On the contrary, it is important to undertake research to honestly determine whether or not distance courses are effective, and more importantly, to determine where and how improvements can be made. This

paper presents the outcomes of study on the efficacy of the blended instructional strategies used by OUSL's Faculty of Engineering Technology. It is anticipated that this research will help inform others seeking to implement similar programmes offered at a distance.

Sample

A convenience sample of 11 faculty members was selected for this study. Those selected for this study were all responsible for teaching engineering at OUSL, using blended education instructional methods. The purpose of this research was to elicit faculty's opinions and ideas on possible initiatives and remedies to make the delivery of engineering courses at the OUSL more effective. This paper presents the findings of this study.

Method

Eleven (n = 11) faculty members were questioned on various aspects of educational programmes offered by OUSL's Faculty of Engineering Technology. Faculty were questioned to determine the sample's demographic profile and to solicit their opinions of the methods used for teaching distance engineering courses at the OUSL. This research also sought to determine faculty's opinions on core instructional methods: i.e., day schools, student support, and student performance. This research also sought to determine faculty's overall job satisfaction with OUSL's Faculty of Engineering Technology. Confidentiality was maintained by using pseudonyms when analyzing the data. The data obtained then underwent content analysis using contextual analysis on pre-determined topics.

To ensure the interviews would be representative of OUSL's entire Faculty of Engineering Technology, faculty from all the six departments were interviewed: (a) Agriculture and Plantation; (b) Civil; (c) Electrical and Computer; (d) Mechanical; (e) Textile and Apparel; (f) Mathematics and Philosophy of Engineering. Of the sample (n = 11), two were females and nine were males. Respondents' ages ranged from 32 to 64 years, yielding an average age of 49 years. Faculty's teaching experience ranged from five years to 24 years, yielding an average teaching experience of 13 years. None had experience with teaching in a distance education setting prior to joining OUSL. Of the 11 respondents interviewed, two indicated that they had traditional academic teaching experience; three had both industrial and traditional academic teaching experience; four had only industrial experience; while two were wholly new to teaching, having neither taught industrial or academic courses. Although all reported that they lacked experience teaching at a distance, all faculty interviewed held the opinion that engineering could be taught at a distance, but only if proper arrangements were made to ensure practical hands-on course components are incorporated.

Blended Instructional Strategies at OUSL

Faculty members' opinion was solicited on the blended system OUSL adopted to teach engineering skills. Most faculty interviewed agreed that the current blend of instruction comprised of face-to-face components like laboratory classes, field camps, day schools, and tutorial clinics, coupled with print-based instructional materials, seemed to work well. They also opined that in order to teach students engineering knowledge and skills, face-to-face sessions remain necessary. This finding echoes research done by Bilham and Gilmour (1995), who found

that no matter how well designed, engineering courses delivered at a distance will need face-to-face and hands-on components to be successful.

Faculty further reported that the blended instructional strategy employed by OUSL's Faculty of Engineering Technology lacks sufficient variety of distance educational materials. Although custom-designed print-based course materials were reported to be one of the strong points of OUSL's engineering distance programme (remember, many OUSL students lack adequate access to computers) those interviewed also stressed that the engineering courses taught at a distance could also benefit from the use of supplementary audiovisual learning materials and learning aids. They also opined, however, that only students with a good command of English could easily understand the learning materials; whereas those that do not have a strong command of English would need the help of an intermediary, face-to-face tutor. Though faculty members generally agreed that OUSL's print-based learning materials were adequate, some indicated that some of the teaching materials were out-of-date, a finding that suggests the need for OUSL to perform regular and systematic updates of its print-based learning materials for its engineering programmes of study.

Respondents reported that the current blended method of teaching does have several strong points. For example, 'student performance' was identified by faculty as a strong component of the programme. Laboratory classes, tutor-marked assignments, and continuous assessments, were similarly viewed as strong points of the programme. The industrial training component, which exposes students to hands-on work settings, was also viewed as a strong point. Finally, faculty reported that the delivery methods designed to improve students' information gathering and presentation skills was also a strong point of the programme.

Faculty, however, did report some weaknesses with the current blended system of instruction used in the engineering programme. They indicated that greater emphasis must be placed on teaching students how to learn, how to think, and how to do, instead of simply having them regurgitate memorized facts, procedures, and so forth. In short, faculty felt students were not ready for study at a distance. Faculty noted, however, that students' over reliance on rote learning could be largely attributed to traditional 'sage-on-the-stage' pedagogies used in Sri Lanka's secondary school system. Indeed, in Sri Lanka most view higher education as a means to a better life and livelihood. And although access to post-secondary education is free and open to all, the reality is that competition to gain entrance into Sri Lanka's so-called best post-secondary institutions can be very intense indeed. Students are 'differentiated' based on their educational attainment levels. Those scoring the highest grades are typically granted admission into Sri Lanka's 'best' post secondary institutions. In cultural terms, 'better' educational qualifications typically lead to better paying jobs (Little, 1997). In Sri Lanka, such cultural norms remain firmly entrenched. To ensure that their sons or daughters get into Sri Lanka's so-called top universities, high school students tend to be 'spoon-fed' by their teachers. Moreover, many high school aged students benefit from parents who are willing to pay for private tutors that give them a competitive edge they perceive they need. Such educational 'spoon feeding', however, leaves many school leavers in poor shape to participate and benefit from independent, self-guided study needed to succeed in distance education. In order to overcome this apparent deficit, it has been suggested that 'project based' learning should be increased in distance education programmes. William Heard Kilpatrick, who pioneered project-based learning in the early 1900s, advocated the use of student-chosen projects that engender purposeful activity. When students are allowed to choose what they want to learn and explore, they become intrinsically motivated to work harder and strive for the highest quality (Wolk, 1994). However, because peer pressure is on Sri Lanka's students to get into the best school often irrespective of their intrinsic desires, many are 'spoon fed.'

In this study, those faculty interviewed suggested that more weight be given to continuous assessment (i.e., project-based work) and less weight placed on the final examination results. Those interviewed also suggested that students should be encouraged to be gainfully employed while studying at a distance, as this would give them more opportunity to apply the new skills they have learned on the job. For those students who are unemployed, faculty opined that they could gain competency and proficiency during their industrial work placements. Many interviewed felt that the integration of distance learning with paid work would reduce the need for face-to-face laboratory sessions, which are currently integral to most engineering based courses offered by OUSL. This view is supported by Deshpande and Ashtikar (2005) who reported that when curriculum is carefully prepared and the delivery medium selected accordingly, and then integrated with real work outcomes, the actual need for hands-on, face-to-face teaching can be significantly reduced. The reduction of time spent on engineering course practice sessions holds significant cost advantages, which in turn, can lead to more effective utilization of physical plants and facilities. Such 'freeing up' of physical resources could then allow for greater numbers of students to be trained.

Most faculty members interviewed felt that OUSL's Faculty of Engineering Technology should increase the variety of the instructional materials used. They also suggested improving Web-based learning materials and introducing computer-based evaluations. They also suggested using more audio-visual materials, video conferencing, multimedia-based lessons – all specially designed for online delivery.

Indeed, with the expansion of information and communication technologies many universities worldwide are now offering engineering related courses by distance education. These institutions have adopted various instructional strategies needed to impart necessary practical skills to students.

For example, Grimoni, Belico dos Reis, and Tori (1998) describe the success of using multimedia for their existing electrical engineering on-campus students. Kondo and Ishijima (1999) discuss a distance learning system for engineering education via the Internet, using multimedia technologies and mathematical tools for a course in control engineering. Lieberman and Cheung (2007) report on the development of remote-controlled laboratory exercises for their distance laser and fibre-optics engineering technology programme. To address problems inherent in hands-on laboratories and teaching such laboratories at a distance, many institutions now use computer simulations as an inexpensive way to expose more students to the power of real laboratories without them having to incur the burden of costs associated with time and travel. Simulation software enables delivery of laboratory facilities to the front door of students' homes (Gorrell, 1992). Constant software upgrades have also resulted in aggregate improvements in distance education (Thomas & Hooper, 1991). Internet-based simulations can be used flexibly by students anytime, anywhere. According to Alhalabi, Marcovitz, Hamza and Petrie (2004), however, although simulations can serve important purposes, in some cases, such simulations are an inadequate substitute for real, hands-on laboratory experiences. Although simulation serves the purpose of initial experimentation, these authors opined that it cannot provide the same range of possibilities that manipulating physical material does. In some fields, such as electrical and mechanical engineering, actual experiences with real physical elements are necessary.

Based on these extensive studies, the conclusion was drawn that the inherent weakness of courses taught via the Internet that require laboratory experiments is that they lack non-concrete representation of reality. Some indicated, however, that this weakness could be offset by introducing virtual labs that allow students to perform experiments via the Internet (Hamza, Perez, & Checker, 2001).

OUSL Day Schools

Because most students lack access to computers and, by logical extension, access to the Internet, OUSL's day schools serve as the main face-to-face component in all its engineering courses. Faculty interviewed in this study were unanimous in declaring that the day schools are vitally important for students enrolled in OUSL's engineering programme. Most noted, however, that attendance in the day schools was poor at best, and for those students that did attend, most came to class ill prepared. Indeed, it was reported by faculty that most students expected to be lectured on – that is 'spoon fed' – the lesson materials. In light of this empirical observation, the Faculty of Engineering Technology's day schools could be viewed as failures. The good news is that many suggestions offered by engineering faculty interviewed for this study could make OUSL's day schools more meaningful and effective for students.

For instance, faculty suggested that poorly designed course materials could be the root cause of students coming to the day schools ill prepared. It was recommended, therefore, that the lesson materials be simplified and made more attractive to students. As the texts are in English, it was also recommended that efforts should be made to improve students' command of the English language. In addition, if students are armed with supplementary audio and video materials that interconnect with the printed learning materials, they will be tacitly encouraged to read the lesson materials, and thus arrive at the day schools better prepared. Use of supplementary online support and tools, such as PowerPoint presentations and video programmes, was recommended to make the day schools more contextually meaningful and interesting for students. Faculty also felt that providing students with a glossary of the technical terms could aid in comprehension. For example, some faculty members noted that students tend to stop studying if they come across unknown words or concepts, a finding that is supported in the literature by Pavani and Lukowiecki (2000) who found that engineering programmes should provide students quick and easy access to reference information. This finding clearly underscores the need for inclusion of glossaries and reference materials in the design and development of OUSL's engineering course contents.

Faculty also reported that students do not come prepared for day schools, simply because they are unaware of how they should prepare for the day schools. It was suggested, therefore, that students be required to attend an orientation session prior to starting their programme of study, a session that stresses the difference between an OUSL day school and formal lectures at conventional universities. Faculty further suggested that students must be taught how to learn independently. It was noted that many students enrolled in OUSL's Faculty of Engineering Technology programmes drop-out simply because they are unsuited for the rigors of studying engineering sciences at a distance, often because they are more used to being 'spoon fed' information. To lower student drop-out rates and ensure that they are not wasting their valuable time, pre-screening efforts that measures an individual's readiness for distance learning should be mandatory for all wishing to enroll in OUSL's engineering programme. Finally, one faculty member went so far as to suggest that students who come to the day schools unprepared, should be sent home immediately, which would impress upon them the importance of being fully prepared for the day school sessions.

Student Support

Faculty members were asked their opinions of the various forms of student support provided by OUSL's Faculty of Engineering Technology. Most were divided on the issue of student support, with some faculty reporting that the student support provided was adequate, while others

determined it was inadequate. One faculty member in particular stressed his dissatisfaction with the "temporary demonstrators" that lacked both adequate academic standing and training to give proper guidance to students. This faculty member also suggested that laboratory classes should be arranged to take place on weekends, simply because gainfully employed students found it difficult to attend on weekdays. Another suggestion offered by faculty members was that all faculty should be more proactive in providing students with needed support, and that the Faculty of Engineering Technology should have dedicated staff located in OUSL's regional and study centres.

Further, a change in university culture was recommended by those faculty interviewed. In simple terms, it was felt that all OUSL's academic and administrative staff should strive to provide a more proactive and supportive learning environment for its students. Customer service and accountability is central to such a scenario according to those interviewed. Most interviewed felt that all faculty and staff must embrace a culture premised on their genuine commitment to student success. They opined that OUSL staff and faculty must be empowered to take control for their own job roles and responsibilities, and that all must be held fully responsible for their own job and teaching performance.

On the other hand, in light of limited resources currently available at OUSL, some respondents reported that they were satisfied with the support provided by the Faculty of Engineering Technology. Nonetheless, they also pointed out that improvements in library and Internet facilities were needed at all OUSL's study/ regional centres. One faculty member pointedly suggested that teacher-to-student interaction could be increased by assigning between 25-50 students to one tutor and that the sole purpose of this tutor would be to discuss personal and academic problems. It was also opined that student support could be improved through simple measures, such as sending course and programme information materials to students on time (i.e., timeliness was noted to be a problem). It was also suggested that students could benefit greatly by helping them find industrial training placements.

Student Performance

Faculty members were queried on student performance, a contentious area in which none interviewed expressed satisfaction. Faculty offered a number of explanations for students' poor performance and suggested ways in which such performance could be improved. These responses are summarized in Table 1 (next page).

Table 1. Root causes of poor student performance and suggested remedial actions

Root causes for Poor Student Performance	**Suggested Remedial Actions**
o *Students do not adapt themselves to learn at a distance*	o Applicants must be screened on the basis of their ability to learn through distance education. o When they join the university, initial courses must be delivered in a more conventional way; distance teaching courses should be introduced gradually as students progress through the programme. o The orientation of courses must be changed from teacher-centred to learner-centred. o Overall changes in method of education from school level must be introduced. o Student must be trained to do "self studies".
o *Students join the programme with unrealistic expectations that do not match the objectives of the courses/programme* o *Students do not know what they are getting through the ODL.* o *Workload is excessive for working students.* o *Students do not prepare for day schools.*	o Proper counselling should be done before and during the registration
o *Non proficiency in English* o *Students not capable of doing engineering subjects are enrolled into the programme*	o English language support must be provided to enable students to improve their language ability.
o *The way the courses are presented and delivered may not be to the liking of the students*	o Applicants must be screened on their ability to follow engineering-related courses. o The instructional package and teaching must be improved
o	o

Faculty Satisfaction

The final phase of the interview focused on job satisfaction. Eight (n = 8) faculty members reported that they were generally satisfied with their work at the Faculty of Engineering Technology. Three faculty members (n = 3) reported that they were not satisfied. Unlike teaching at a conventional university, teaching at OUSL was felt to be challenging and offered rewarding new experiences each day. One faculty member reported that the distance learning environment increases access to serve more students. According to this particular faculty member, "the future of education lies in distance education." Some faculty reported distance education to be a good vehicle for engineering education, simply because this mode of educational delivery encourages independent learning. In other words, learning how to learn independently was thought to be necessary for helping future graduates rise to real-life challenges they will face everyday on the job. Another reported advantage was that distance education can expand access by enabling mature students to benefit from a university-level education, all while working and tending to their families. Further, many faculty felt OUSL exposes its students to wider issues concerning teaching and learning than a conventional university. One faculty member, however, reported dissatisfaction at the lack of additional institutional support for those who work beyond their routine duties.

Conclusions

The study reported in this paper yields many useful insights into various aspects of the instructional strategies currently employed by OUSL's Faculty of Engineering Technology. Faculty members' views on print-based materials was mixed. While the availability of print-based materials and student evaluation were identified as strong points, faculty reported that one of the main constraints facing OUSL's Faculty of Engineering Technology is that it currently lacks sufficient variety in the distance learning materials used. Those interviewed also noted that students were generally unprepared for the day schools, but many suggested measures to remedy this problem. Students' lacking independent learning skills was similarly identified by faculty as one of the greatest obstacles to teaching at a distance; many constructive suggestions, however, were given that could help students adapt to learning at a distance. None of the faculty interviewed reported being satisfied with their students' performance; however, many useful suggestions were offered on how to improve student performance. Finally, most faculty members interviewed were generally satisfied with their work at the Open University of Sri Lanka.

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Book Review – New Directions in University Education: Perspectives from the Caribbean

Editors: Elizabeth F. Watson & Jamillah Grant Barbado (2007). *New Directions in University Education: Perspectives from the Caribbean.* Barbados: The Learning Resource Centre, The University of the West Indies (220 pages). ISBN: 978-976-8251-71-0.

Reviewer: Judith Soares, University of the West Indies, Barbados

At a time when universities and other institutions of higher education worldwide are increasingly embracing the virtual environment for learning, and pursuing new educational techniques to maximise student learning and knowledge creation, *The University of the West Indies* (UWI) is determined to place greater emphasis on quality teaching and improved learning, and on removing existing barriers to people in the pursuit of higher education in the region UWI serves.

In its bold efforts to be innovative and to encourage the search for and creation of knowledge, The UWI, a three-campus entity, faces challenges, which are not uncommon to universities, particularly those in the countries in the south. The progress and challenges of this institution are recorded in the recently published *New Directions in University Education: Perspectives from the Caribbean* edited by Elizabeth F. Watson, founding librarian of The UWI's Learning Resource Centre and Jamillah Grant, the institution's Instructional Development Specialist, both of whom are located at the Barbados campus. This collection of 10 essays records The University of the West Indies' tertiary level education initiatives, which include the location of the student at the centre of the learning process. These initiatives, with lessons for the developing world, range from the integration of information communication technology into the institution's programme of activities, to information delivery and curriculum development.

The book appropriately opens with Michael L. Thomas' "The Liberalization of Higher Education: Its impact and implications for The UWI and tertiary education in the Anglophone Caribbean – Potentials and risks for the delivery of cross-border education". This article, which makes excellent reading, is very timely, and comes at a time when the liberalization of higher education in the region is offering, at the same time, both benefits and challenges. Thomas' critical examination of the very real issues involved in cross-border education, a consequence of the General Agreement on Trade in Services (GATS), indicates that the decision to open up all markets to the provision of private educational services can work against the best interests of our region, presenting, as it were "serious and substantial threats to the very existence of a vigorous public education system" (p.51). This piece has relevance not only for the Caribbean, but for the entire developing world.

Jamillah Grant's and Elisabeth Bladh's innovative "Teaching French in the Anglophone Caribbean: A Barbadian perspective," highlights the problems French language students faced in fully developing their competence in this field of study. They argue for technological interventions to enhance the ability of students to master the French language. In this respect, the authors offer relevant advice on creating an environment of learning which would allow for greater proficiency and fluency in this foreign language.

Complementing this approach is Elizabeth Watson's "Videos in the Classroom: Experiences from a developing country," which supports and promotes the use of the video as a learning tool. In this piece, Watson highlights the role of The UWI's Learning Resource Centre as an educational support unit that values the use of commercially-produced videos in curriculum delivery at the Barbados campus. Though speaking to the experience in Barbados, I feel Watson's work has relevance to all learning situations and academics/ instructors who can appreciate the importance of video-graphic information services. Jamillah Grant's second contribution as sole author, "Instructional Development: Just-in-time delivery supports teaching, learning and self-development" seems novel in advising on the way in which 'just-in-time' support services can be effective in the absence of technological delivery systems.

In Kathleen Helenese-Paul's "The Library and the Museum: an outline of strategies for enhancing access at The UWI Main Library, St. Augustine," we learn of the significance of the library in supporting teaching, learning and research and that of the museum, not just in providing information, but in connecting the individual with their history, their heritage and their culture in a very practical and organic way. Focusing on the experience of The UWI's campus in Trinidad and Tobago, Helenese-Paul takes the reader into a world of personalized and social learning offered by history and culture. Sharon Alexander-Gooding takes up the very important and indispensable practice of records management. In her contribution to this book, "Training Records Managers and Archivists: Tradition and innovation at the UWI Cave Hill – "Running to keep walking in the information race" Alexander-Gooding argues more emphasis needs to be placed on records management because "[S]uch records support business and strategic directions, document decisions, ensure accountability and capture corporate memory" (p. 68).

No less important is Ingrid Iton's "Creating Synergies in Information Literacy Instruction: A Caribbean Higher Education Perspective," which presents a sharp analysis of The UWI's newly introduced programme of information literacy at the Main Library at the Barbados campus. In her evaluation, Iton concludes that for learning to take place and for the project to be more effective, librarians and the library must be integrated into all academic programme activities. The use of 'role playing' in the teaching of computer studies to upper level students at the Barbados campus is the focus of Colin Depradine's essay. This is a method of teaching, which according to Depradine will allow The UWI to produce students/ professionals who are both efficient and effective in the field of computer programming. In his "Using role-playing tools to teach advanced computer programming in the Caribbean," Depradine argues that role-play enables students "to apply abstract techniques to real-world situations" (p. 85).

Information technologies also come up for discussion with specific reference to programmes being implemented in the Caribbean. Permanand Mohan and Ben Kei Daniel analyse the existing use of Caribbean Learning Object Repositories for Education (CaribLORE) a blended learning model introduced to incorporate new and emerging technologies of learning, critical to enhancing

and expanding The UWI's reach in distance education and distance learning. Their discussion has value for the global community of distance education providers who are intent on implementing successful models of distance learning. In similar vein, Gerard H. Rogers' "ALN at the UWI: A look at institutional readiness and other key issues" focuses specifically on the advantages and disadvantages of Asynchronous Learning Networks (ALN) at The UWI. Specific reference is made to the Trinidad and Tobago Campus in a discussion which raises issues of quality assurance, inadequate physical infrastructure, increasing student enrollment, the sustainability of programmes, and the institution's readiness to take on new approaches to expand learning.

Overall, the text reads very well and is a useful companion to all those involved in distance education and open and blended learning. More importantly, however, this book is of invaluable worth to The UWI and other like institutions, which are embracing new directions in the delivery of higher education.

One flaw is evident. The book carries two different titles: "New Directions in University Education: Perspectives from the Caribbean" and "New Directions in University Education: Perspectives from the developing world." The good new is that is inadvertent error does not take away from the quality of the publication.

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Book Review – Collaborative Learning: Two perspectives on theory and practice

Editor: T. S. Roberts (2004). *Online collaborative learning: Theory and practice*. Hershey, PA.: Information Science Publishing. Hardcover (336 pp.). ISBN: 978-1-5914-0174-2.

Editor: E. F. Barkley, K. P. Cross, & C. H. Major (2005). *Collaborative learning techniques: A handbook for college faculty*. San Francisco: Jossey-Bass. Paperback (320 pp). ISBN: 978-0-7879-5518-2.

Reviewer: Sharon Stoerger, School of Library and Information Science, Indiana University, USA

As a new college instructor, I am always looking for innovative ways to motivate my students and encourage them to collaborate with their peers. I am not alone. According to a recent Horizon Report (2008) a "renewed emphasis on collaborative learning is pushing the educational community to develop new forms of interaction" (p. 5). The incorporation of Web 2.0 technologies into educational settings is also changing the way we think about teaching and learning by enabling students to access courses and materials anytime, anyplace. For example, Webware suites, such as Google.docs and even virtual worlds, like *Second Life*, can be used to support collaborative learning both in and out of the classroom. Because of these technological advances, places like the local café off-campus or the hallway areas outside the departmental offices are more than merely social gathering areas; they are also becoming educational spaces. While teaching and learning are no longer restricted to the formal settings, this does not mean that we should ignore classroom-based models. According to John Seely Brown and Richard Adler (2008), social learning areas, including virtual worlds, can "coexit with and expand traditional education" (p. 22).

Beginning with non-traditional settings, the selections in the book, *Online Collaborative Learning: Theory and Practice*, explore the social learning concept and examine different ways to incorporate this approach into the curriculum. These chapters are written by a diverse group of academics who represent countries such as Australia, Canada, Denmark, Germany, and the United States. Overseeing this collection is Tim Roberts, a Senior Lecturer at the Central Queensland University in Australia. Not only does this editor have experience teaching thousands of students in locations around the world – many who are studying topics completely online – but he has won awards for his research. Thus, Roberts' experiences as a practitioner and a researcher are adequate qualifications for bringing together these works.

As the full title suggests, *Online Collaborative Learning* presents a blend of theoretical and practical perspectives. While there is a wealth of information about the theory and practice of online learning, the literature about online cooperative and collaborative is lacking. This collection of chapters attempts to fill this gap. Before launching into the pieces themselves, though, Roberts provides a discussion about the concept of collaborative learning, which he

emphasizes is not a new one. He also attempts to clarify the confusion that surrounds the terms "cooperative" and "collaborative" with regards to learning. While new theories of cognition and learning continue to be touted, Roberts notes that formal learning often concentrates solely on individual learning efforts. Moreover, the problems associated with collaborative learning, such as the "free rider effect," make some educators hesitant to adopt this type of strategy.

Following the Introduction, the book continues with Sue Bennett's piece on supporting collaborative project teams using computer-based technologies. The collection concludes with an examination of two concrete evaluation approaches of computer supported collaborative learning (CSCL). While all of the chapters presented in this selection are informative, there are four that are worth mentioning in greater detail. They include the entries by Curt Bonk, Robert Wisher, and Ji-Yeon Lee (Chapter III), John Dirkx and Regina Smith (Chapter VI), Charles Graham and Melanie Misanchuk (Chapter VIII), and Joanne McInnerney and Tim Roberts (Chapter IX).

The work by Bonk, Wisher, and Lee (Chapter III) is unique in that these authors focus their attention on the instructor. Specifically, they examine the ways in which collaborative technologies, as well as the learner-centered movement have affected those teaching in an online environment. In their discussion, Bonk and his colleagues outline 10 key benefits and implications of e-learning. They also discuss 10 problems and their solutions. One point they make is that while the theories have moved toward a more active, learner-centered approach, online learning tools are still rooted in the teacher-centered model. In an attempt to combat this problem, the authors point out that some instructors have developed their own interactive tools. Another aspect that is emphasized by the authors is the creation of a safe, positive environment, as well as timely and constructive feedback. In closing, Bonk and his group examine some of the problems with e-learning, which include grading and support.

Dirkx and Smith (Chapter VI) move their gaze away from the instructor to focus their attention on the students – particularly those who are ambivalent about group work. One thing that is mentioned early on in this chapter is that online technologies often cause these negative feelings toward collaborative activities to increase. To examine this issue in greater detail, the authors conducted case studies on collaborative learning groups in an online graduate course, which were situated within theoretical perspectives associated with collaborative learning and group dynamics. Not only did the students experience problems with collaborative learning, such as unequal contributions of group members and time factors, but the authors found that these individuals often divided the collaborative work into a collection of individual efforts. However, Dirkx and his colleague emphasize that "learning to learn collaboratively often involves a dramatic shift in one's views of teaching and learning" (p. 137).

In Chapter VIII, Graham and Misanchuk examine the issues surrounding computer-mediated learning groups or virtual teams. The authors begin by highlighting the gap that exists in the literature on collaborating at a distance, which tends to focus on the communication aspects rather than on group work as an instructional strategy. In addition to discussing the difference between cooperative and collaborative work, Graham and his colleague continue by defining work groups, learning groups, and virtual teams. In their examination of vignettes from an online master's degree program in instructional technology, the authors present challenges faced by the students. They also note one disappointment: several groups chose to complete their tasks in a manner that was more efficient rather than one that focused more on learning.

For those interested in exploring the differences between collaborative and cooperative learning, the section by McInnerney and Roberts (Chapter IX) is a good starting point. The authors begin by highlighting the fact that cooperative and collaborative learning techniques are not widely

used in higher education. This is in spite of the benefits associated with these methods. McInnerney and her colleague then provide a detailed examination of the literature on the terms, "cooperative" and "collaborative," as well as the confusion and conflation that surrounds them. As the authors point out, "often the title of a paper may use the word cooperative, while the body of the paper discussion collaborative learning or vise versa" (p. 206). In their discussion on the reluctance of university educators to explore new learning paradigms, such as cooperative and collaborative learning, McInnerney and Roberts refer to the work of Panitz. According to their interpretation of Panitz's research, there are five sources for this lack of enthusiasm, which includes students' resistance to collaborative learning techniques – a sentiment which links back to comments made by Dirkx and Smith (Chapter VI).

While these chapters represent some of the strong points in this collection, the book is not without its flaws. One of the weakest sections is the concluding chapter which examines human-computer interaction (HCI) in a social context. This is not to say that the authors – John Nash, Christoph Richter, and Heidrun Allert – do not have a valid entry; they do. The problem is perhaps with its placement in the collection at the end. Rather than summarizing or building on the earlier works, this entry shifts the line of thought in a completely different direction. It is almost as if the editor considered the design element to be missing and tacked it on at the end to satisfy those who are interested in theories surrounding evaluation approaches. In this case, the focus is on scenario-based design and program-theory evaluation. Despite the fact that Nash and his group illuminate these theories with details and examples, it does not provide a very satisfying conclusion to the book as a whole.

Those who are looking for a supplement to Roberts' *Online Collaborative Learning* should consider investigating the writings of Elizabeth F. Barkley, K. Patricia Cross, and Claire Howell Major. In *Collaborative Learning Techniques: A Handbook for College Faculty*, Barkley, Cross, and Major provide detailed procedures for implementing collaborative learning activities in face-to-face and online higher education settings. In contrast to Robert's collection, a book that focuses more on the theory, *Collaborative Learning Techniques* concentrates on practical ways for instructors to use these approaches. The book is divided into three parts – Introduction, Implementing Collaborative Learning, and Collaborative Learning Techniques (also referred to as CoLTs) – and are designed to discuss the "Why," "How," and "What" collaborative learning questions.

In the Introduction, Barkley and her colleagues make a case for collaborative learning. By providing the pedagogical rationale for collaborative learning, the authors frame their discussion around the effectiveness of this method. One of the key points the authors stress in this portion of the book is the notion that students create their own knowledge and are not merely empty receptacles for teachers to fill. It is in this section of the book that Barkley and her group note that much of the research on collaborative learning is centered on K-12, and now higher education is trying to catch up. Like several of the authors in the Roberts collection (e.g., Dirkx and Smith; Graham and Misanchuk), Barkley, Cross, and Major attempt to clarify the difference between cooperative and collaborative learning. One piece of information that they include that is not specifically mentioned in many other writings is that cooperative learning got its beginnings as an alternative to the "overemphasis on competition in traditional education" (p. 5). Also, the authors propose that perhaps a new term is needed to move away from the confusion that surrounds cooperative and collaborative learning. While Barkley and her colleagues quickly dismiss this option, the possibility lingers in their use of the acronym, CoLTs.

In Part 2 of this book, the authors examine ways to create productive learning environments through collaborative learning groups. As Barkley and her group stress, "embarking upon

collaborative learning should be a reasonable adventure – stimulating, challenging, and requiring thoughtful advanced planning" (p. 27). This section focuses on implementing collaborative learning and examines issues such as orienting students, structuring the learning tasks, and facilitating student collaboration. Also, forming groups can be an unnatural process, and this section describes three types of groups instructors can use – informal, formal, or base. As the authors note, the type of group will depend on the nature of the assignment, the duration of the task, and in some cases, the arrangement of the physical setting. Further, the authors provide a chapter on grading and evaluating collaborative learning assignments and projects.

While it is difficult to argue with the materials presented by the authors, one comment they make in Part 2 is questionable. They discuss the lack of research that examines groups that fail, as well as those that investigate these experiences on learning. Barkley, Cross, and Major also indicate that they found no work that examines the impact of collaborative learning on teachers. However, Roberts includes a chapter in his 2004 collection, *Online Collaborative Learning* by Bonk, Wisher, and Lee that examines this topic. Because these two titles were published a year apart, it is possible that Barkley and her colleagues did not have access to the chapter by Bonk and his colleagues. Nonetheless, this oversight stands out, particularly if these two books are read together.

The final section, Part 3, is subdivided into five parts that include a total of 30 collaborative learning techniques for discussion, techniques for reciprocal teaching, techniques for problem solving, techniques using graphic information organizers, and techniques focusing on writing. With this section, the authors strive to provide answers to the question, "What can I do, in a practical way, to engage students actively in collaborative learning?" (p. xiv). Each of these subcategories outlines step-by-step instructions for at least five activities that can be implemented in the classroom. As the authors write, this section is "like a collection of well-tested recipes" (p. 95). For those teaching at a distance, details about the option to transfer the activities to an online forum are provided, as well.

Teachers, researchers, students, and designers who are interested in the theoretical foundations of collaborative learning will find the chapters in *Online Collaborative Learning* worthwhile. The diverse array of authors provides a rich assortment of perspectives on the computer-supported collaborative learning. However, individuals who are looking for detailed ways to incorporate these techniques into the curriculum will find this book lacking. As the title suggests, practice is incorporated into the discussion, but it is presented in a more formal and academic manner. For those seeking practical assistance in incorporating collaborative learning methods into the curriculum, *Collaborative Learning Techniques* by Barkley, Cross, and Major serves as a logical companion piece that extends the theory from the perches high atop the ivory tower of academia to the front lines of the classroom. Emerging technologies are changing the way individuals communicate, collaborate, and learn through social interaction. Thus, the importance of the content of the books described in this review will only increase as these new tools impact teaching, learning, and creativity in educational settings.

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Technical Evaluation Report

62. The Return of Educational Radio?

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Abstract

This paper examines one of the traditional technologies of distance education, radio, and presents examples of educational and community radio usage in Asia and Africa. Instead of merely transposing western approaches to distance education in developing countries, it is suggested that the developed world can learn from uses of radio in developing countries, and that the medium deserves greater attention as a means of giving educational opportunity to rural, isolated peoples worldwide.

Keywords: distance education; radio; Asia; Africa

Introduction

Throughout its overall history in developed nations, distance education (DE) has flourished in the spirit of social betterment and integration. Only in recent decades has DE become a tool for individual or commercial betterment in learning institutions and corporate training. In the mid 20th Century, Canadian movements such as the *National Film Board* and the *National Farm Radio Forum* were popular means of providing basic adult education to those living in remote geographical areas, and of instilling a Canadian education to new members of society (Selman & Dampier, 1998). In the 1960s, these programmes suffered major budget cuts and lost their perceived social importance. Since then, DE initiatives with a more individualistic scope have emerged, designed primarily to fulfil the need for individuals to be retrained for new careers or for personal motives.

In the United Kingdom similarly, The Open University (OUUK) was established in 1969 with the objective of making education accessible to lower-income adults who would not normally be able to access academic institutions (The Open University, 2004). In the 1980s and '90s, the OUUK's mandate evolved to meet the part-time higher education needs of employed adults. In its strategic planning document, the OUUK claims to be socially conscious, aiming to serve developing countries and reduce the digital divide. This university openly admits, however, in the same strategic document, to a decreasing UK market (The Open University, 2008). It is feasible, therefore, that the OUUK's current global vision is based on market motives rather than actual

social and political vision. This shift from a community-based DE vision to a individual-based mandate has not taken place in developing countries, however, and the traditional DE media remain appropriate, affordable, and accessible there, while being almost completely forgotten in western DE. The current paper stresses the value of educational and community radio in African and Asian distance education, and the uses it could also play in today's western style of DE. In this way, the paper attempts to counter-balance the common emphasis on the export of DE technologies from developed nations to the developing world, and to indicate that there are lessons to be learned about DE practice on all sides.

Radio in Asia

Educational radio is the term given to the medium's use in formal learning systems, whether primary or higher education. It is typically used as a means for course material delivery, and often integrated with various kinds of interaction: for example, in classrooms, discussion groups, or via the telephone. Community radio, on the other hand, involves informal learning processes whereby communities plan, own, and operate their own radio stations. The informal learning topics of community radio typically include child nutrition, family planning, and agricultural tips. Community radio necessarily involves a non-profit enterprise, community ownership and participation, and usually a participatory approach to learning (UNDP & UNESCO, 2004). Most community radio material is in the local language and includes song, stories, and drama. It provides a fertile educational terrain, allowing people to "hear about the lives and circumstances of the poor and excluded in words and terms that they themselves use. Radio, by nature, gives us the ability to 'hear' content, context, passion and pain" (Gray-Felder, in Dagron, 2001, p. 2). Dagron further contends that radio is the "most often utilised and successful medium for social change" (p. 2). For Freire, "ordinary people, not just talented leaders, can and should be agents of change" (Kane, 2001, p. 7); and radio is an obvious medium for catering to such change by allowing ideas to be shared and beliefs critically questioned.

The two forms of radio are thus quite distinct in nature and serve needs, educational radio providing basic or advanced education and community radio enabling informal learning and social transformation. Community radio typically draws on local cultures and is of a participatory nature, whereas educational radio generally has a national/ institutional character. Ultimately, both aim to improve the quality of life. This may be seen in an examination of educational and community radio initiatives in Asia.

An exemplary instance of modern educational radio in Asia is a community radio station in the rural area of Kothmale, Sri Lanka. The station was started in 1989 by the Sri Lanka Broadcasting Corporation to provide communication facilities to 3,000 families displaced by the construction of a dam (Dagron, 2001). Through sponsorship from UNESCO, the University of Colombo and others, the radio station project was expanded in 1998 by the addition of an Internet component. Three Internet points were established, so that the radio could serve as a bridge between the World-Wide Web and the rural community in central Sri Lanka. Regular radio programmes relay information located on the Internet and of interest to the local people. In addition, listeners call in with queries, and the station staff searches the Web for answers. Due to the expertise its staff members have acquired in Internet usage, the radio station now has its own website in three languages.

As a result of this innovative radio/ Internet project, community members in Kothale have begun to build webpages in the local languages, and to provide their youth with training in Internet skills. Computer usage at the Internet points has been quite high with, on average, approximately 200 users accessing the service's two computers during any 14 day period (Pringle & David, 2003). Organisational and financial issues commonly hinder the radio station's smooth operations, however, including the frequent interruption of the Internet supply. Pringle and David conclude that the overall impact of Kothmale Community radio is difficult to assess, although it has given rise to a "dramatically increased awareness of the benefits of new community technology" (p. 110). Dagron notes that young people and English speakers have been the principal beneficiaries of Kothmale's hybrid technology. The model bridges traditional technologies with the most modern, taking advantage of aspects of both. Its successful 20-year survival operation in Sri Lanka may partly be due to Sri Lanka's high literacy rate.

Radio has also been extensively used in India for primary, secondary and higher education purposes as well as informal learning. Its first applications were in the Farm Radio Forums of the 1950s, which placed "radio on the educational map of India" (Mishra, 2005). It was shown that those who participated in the listening groups at the Poona radio forum learned more about agriculture, health and literacy than those who did not. In primary school education, radio was found most effective in the acquisition of factual information, commonly via story and drama formats. India has also experimented with the use of hybrid, 'radio-vision' technologies in middle-school education. This consists of the combined use of radio and text support, and has been found to be particularly effective in subject areas such as geography and disciplines requiring graphic illustration. At the Indira Gandhi National Open University (IGNOU) established in 1985, radio has been extensively used (Agrawal, 2005); and since 2001 an Indian educational radio network, *Gyan-Vani*, has been extensively used for university-level and other educational programmes (Chandar & Sharma, 2003).

Community radio projects sponsored by UNDP and UNESCO have been particularly successful in rural India. In Pasatapur, for example, an NGO named *Deccan Development Society* has used radio to organise illiterate and marginalised women in the community (UNDP & UNESCO, 2004). Village associations have emerged as a result of local radio projects. Despite the success of community radio in involving women in participatory activities, a major obstacle to its development is the licensing hurdle caused by the fact that the Indian Government has yet to provide a legal framework for community radio. The legislation passed in 2002 allows community radio to be established solely in educational institutions such as universities and technical schools.

Despite the popularity of India's radio initiatives, the medium has never received the political attention required to make it widely successful; and it has played a marginal role compared with that of educational television (Mishra, 2005). Currently, India is placing much emphasis on the development of DE Internet technologies; and this is increasing the educational access gap between the privileged classes and the poor and rural sectors of society (Agrawal, 2005). China, on the other hand, has implemented educational policies since the 1960s which made primary and rural schooling compulsory (Gulati, 2008), and has implemented radio and TV programmes for primary schools up to year nine in rural areas. At the university level, the Chinese Radio and TV University system (CRTVU) was developed as part of the government's economic reconstruction and in the effort to build up the national workforce (Rumble, 1989; Hodes, 1995). The CRTVU is an hierarchical system with five tiers whereby course material is primarily developed by the central University and programmes are delivered by regional universities and colleges.

Transmission of class material is via radio or TV to tutorial groups of approximately 40 students in local centres.

Despite efforts to reinforce rural educational systems, however, rural schooling in China has suffered from poor teacher quality and shrinking government budgets. Overall, as in India, the successes of educational radio in China have been overlooked and the movement has been allowed to wane, spurred by the promise of new technologies such as TV and the Internet, and by a general lack of investment in rural education, which is the main target of radio programmes. Gulati (2008) highlights the disparities between urban and rural, men and women, and the privileged and non-privileged, caused by the targeting of investment in Internet-based education methods on the more advantaged groups. Hence, the rural poor lag increasingly far behind the urban learners in both India and China; and yet, as Gulati indicates, "printed material, radio, and television remain more effective and accessible for rural and disadvantaged groups" (p. 12).

Radio in Africa

By comparison with Asian nations, African countries are at a more rudimentary stage of development in their educational practices, policies, and uses of educational technologies. In Africa, there is far lower TV coverage and fewer TV sets than in Asia, decidedly less Internet access, fewer fixed telephone lines and limited computer access (see Table 1). Today, the most appropriate models for improving economic and social conditions in Africa are thus the earlier uses of radio in contemporary Asia and mid-19 Century Canada. Insights into how the models of radio for DE and community radio in Asia have been creatively applied in Africa can be gained from examples of *interactive radio instruction* (IRI) in Kenya and Mali.

Table 1. Technological usage in Asia and Africa

	Asia	**Africa**
Population	3.9 billion (59% of world population)	923 million (14% of world population)
Gross Domestic Product	$3,197	$1,079
Fixed telephones	48% of the world's total	<2% of the world's total
Cell Phone subscribers	1,137 million (29% of its population)	198 million (21% of its population)
Broadband subscribers	104 million (2.6% of its population)	1 million subscribers (0.1% of its population)

(Source: International Telecommunication Union, 2007).

IRI was first used in Africa in the '80s, to develop a Radio Language Arts (RLA) programme in Kenya for first to third grades (Moulton, 1994; Dock & Helwig, 1999). The IRI lessons were very structured, with timed pauses for chorused replies from the class. They also incorporated time for individual questions and comments. The RLA programme relied extensively on stories, games and songs, and engaged the students in learning by stimulating their fantasies. The basic structure of the lessons was that of a conversation. The IRI approach has since been equally useful in approximately 20 developing countries in Africa, Asia, and South America. It is largely used to

improve the quality of education when teacher training is low or when there is a teacher shortage. Lessons are transmitted by an initial teacher via radio or audio cassettes to classrooms where a supplementary teacher manages the student exercises, class discussion, and follow-up. Exercises and interactive activities are scheduled during pauses in the audio programme. Bosch (1997) showed that IRI can increase learning and improve test scores, and is useful in bringing rural children up to the level of those in urban schools who have access to better teachers and materials. Bosch (2004) has stated that, since the early 1980s, the sustainable success rate for IRI projects has been 66 per cent. This is quite exceptional given the common challenges encountered by DE initiatives in developing countries.

In relation to the informal learning context, there have been numerous long-standing rural radio projects in Western francophone Africa. The rural radio movement started there in the mid 1980s with the goal of reaching people in previously inaccessible rural communities. UNESCO, UNDP, and FAO were major contributors to these projects, and many of them are now self-sustaining. In Mali, there are currently approximately 120 to 150 such radio stations (Del Castello, *personal communication*, 2008).

A key enabler of the rural radio movement in Africa has been the liberalisation of radio waves, although some countries (e.g., Namibia, Uganda, and Zambia) provide rural radio programmes from a centrally controlled radio network. Many local stations are enhanced by Internet connections, as in the Kothmale, Sri Lanka, initiative. Listeners call in with questions, and a researcher finds the answer on the Internet and reports them via radio. This provides non-literate people with access to a wealth of information. In addition, local radio stations in certain locations can pick up broadcasts from Radio France via short-wave receivers and retransmit them on their local stations. These initiatives are usually self-sustaining, generating income through publicity, announcements, and on-air events such as weddings. Agricultural producers pay to make announcements about, for example, sales prices and market days. The IRI initiatives of Kenya and the rural radio projects of West Africa, indicate that some African countries have a rich tradition of both educational and community radio. The overall goal of these rural radio initiatives is one of social awareness and change (Ilboudo & del Castello, 2003).

Radio in the West

It cannot be assumed that educational and community radio is entirely defunct in western nations. In Canada, for example, the medium is still integrated in a declining number of DE and informal learning programmes; and some programmes on National Public Radio in the United States may be regarded as for informal learning purposes. An example of radio use in formal DE is a successful and innovative radio-based programme launched in the 1990s in Wahsa, Northern Ontario, for the estimated 70-90 per cent of First Nation members in Canada who lack a high-school diploma (Bird & McKinnon, 2004). The initial problem of high school attendance in Wahsa was largely due to the absence of local high schools, which meant that students needed to move to other areas of Canada, where they invariably felt out of place. This lead to frequent school dropout as the students returned to Northern Ontario. The Wahsa initiative targeted approximately 900 secondary school students in 23 isolated Canadian communities (Fiddler, 1992), and has enabled students to remain in their homelands by ‘attending’ secondary school via radio, text and local classroom facilities. Students call their teachers toll-free and supplement their learning from radio and text materials via meetings in local centres. The curriculum is well planned and includes one of the native languages, Oji-Cree.

The success of the Wahsa radio initiative can largely be attributed to the collaborative manner in which it was designed by the tribal councils and native-run organisations familiar with local issues. Despite its long-standing success, however, difficulties have arisen in the project including irregular on-air participation by some students, the need for additional learning centres, and the lack of constant DE coordination.

Conclusion

Thomas (2001) states that: "In many areas of the world, radio is still the only medium through which educators can reach a mass audience, simultaneously and at relatively low cost" (¶ 5). Dagron (2001) adds that it is not only an important mechanism for the diffusion of development information in local languages and over widespread and remote geographical areas; it is also a great tool for reinforcing and strengthening cultural expressions and identities. Radio alone will not solve the problems of educational delivery to remote, rural people in the developing world. As Baggaley and Ng (2005) have indicated, there is no single formula for DE in developing countries. Empowerment of ministries of education, higher educational priorities, improved teacher training, the implementation of sustainable programmes, and particular attention to the needs of rural areas, are all necessary steps to this end. Yet radio, if used effectively, can be a powerfully motivating and low-cost educational technology capable of sustaining the oral tradition of indigenous people and cultures. The medium reaches large numbers of people, and allows learners to remain in their own home settings without having to relocate for schooling. It can also protect the heritage of minority languages; and it is accessible to illiterate people.

Radio has its drawbacks, of course. In its original form, it is essentially a one-way communication medium whereby interaction with listeners is minimal. As a result, a radio programme's pace is primarily that of the broadcaster, who can find it difficult to gauge the listeners' prior knowledge and attitudes critical to learning. To compensate for these drawbacks, radio presentations can be packaged with visual and print materials; interactive elements can be organised via listening groups and tutorial classes; and radio cassettes can be used to minimise scheduling problems. As suggested by Dagron (2001), radio can also be combined with Internet techniques. As in the examples of Sri Lanka and West Africa, radio and Internet methods allow communities to embrace the newer technologies and assist illiterate people to gain general knowledge. Due to its wide usage in certain countries and the scarcity of other technologies there, radio clearly has the potential for a significant impact in all societies. The years of experience in Asia should be embraced and shared in Africa; and lessons may be learned from these innovative social initiatives in the developed nations also. A rich diversity of various solutions is necessary to meet the different DE challenges of the international community; and radio should not be overlooked in the mix of emerging approaches.

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Technical Evaluation Report

63. Mobile Learning in Developing Nations

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Abstract

This paper looks at the diffusion and applications of mobile phone technology in Asia and Africa, compared with North America. It indicates that Asian distance education can be the global leader in the development of educational uses for the mobile phone; and it considers the potential for mobile learning in Africa and other developing regions. The paper concludes that it would be a serious disservice to learners and instructors if Asia and Africa were to cast their lot with Web-based learning. By comparison, mobile phone technology is widespread, easy to use, and familiar to learners and instructors.

Keywords: Mobile learning; mobile phones; Asia; Africa; North America; distance education

Introduction

Distance education (DE) in Asia is at a crossroads. It has to choose whether or not it wishes to follow western practices, which will entail increased investment in e-learning methods, or whether it wishes to find its own path and explore new delivery methods that are more suitable for learners in the region. Reliance on e-learning initiatives does not appear to be the best path for distance education in Asia at present. Korea and China, two of the continent's more developed nations, have reported that the implementation of Internet-based learning has been fraught with problems (Baggaley & Belawati, 2007): e.g., lack of proper course monitoring; lack of adequate feedback to students; poor instructional design; poor training for instructors; lack of necessary technology; lack of Internet accessibility; lack of online resources; high costs; and lack of credibility for online degrees, in general.

If the so-called 'developed' nations of Asia are unable to properly implement e-learning projects, what hope is there for the lesser developed nations of Asia and the world? While many developing nations find Internet-based e-learning unsuitable for their needs, mobile learning methods – specifically those involving the use of cell-phones for both formal and informal learning – hold great promise for them. The technology is more affordable; learners are familiar with it; and with proper instructional design it promises educational opportunities with an increased flexibility for learners, satisfying the 'anytime/ anywhere' component of DE for thousands if not millions of learners.

Mobile Phone Diffusion in Asia

Prensky (2004), as cited in Attewell (2005), stated there were approximately 1.5 billion mobile phones in the world. Salaberry and Upton (2007) placed the number as high as 2.5 billion. In the week that the current *IRRODL* report went to press, the total number of mobile phones was reported as reaching 3.3 billion, or half of the world's population (Economist.com, 2008). The fact that mobile phone diffusion is relatively high in China and Korea – as well as Japan and the other developed nations in Asia – should come as no surprise. China is the largest global market for mobile phones. Harwit (2004) wrote that, at the beginning of 2004, China had almost 270 million mobile phone users. Thornton and Houser (2004) reported that by the beginning of 2000 "nearly 60 million Japanese . . . constantly carried mobile phones" (p. 4). Macao and Hong Kong both have well over 100 mobile phone subscribers per 100 people; while Korea has over 80 mobile phone subscribers per 100 people (UNESCAP, 2007).

When these figures are compared with the mobile phone figures in North America the rate of diffusion in Asia appears more startling still. Wijayanto (2006) observes that cell-phone penetration in Asia stood over 700 million units, compared to fewer than 400 million cell-phones in the Americas *combined*. While Asia is already the world's leading consumer of mobile phones, its usage will continue to grow; and the Asia-Pacific market will expand by over 45 per cent by 2010 (ETForecasts.com, 2008). It is not merely the cell-phone's diffusion in the Asian 'tiger' nations that is surprising, however. Its penetration in the lesser developed countries of Asia has also been appreciable. Malaysia, Thailand, and the Philippines all have more than 50 subscribers per 100 people (UNESCAP, 2007), figures that compare favourably with mobile phone penetration in the United States – approx. 70 subscribers per 100 people (Chafe, 2008). Indonesia and Mongolia each have over 20 subscribers per 100 people (UNESCAP, 2007). For all of these lesser developed nations, the number of subscribers per 100 people is considerable in relation to the average gross domestic product (GDP) per capita.

Why have cell-phones become so popular in Asia? According to Gizmocafe.com (2005), a "total lack of any unified standard in North America has stunted the growth of hand-held technologies and services available on this side of the world" (¶ 1); secondly, the lack of a unified standard in North America has curbed "the growth and development of the 3G digital wireless networks and [cell] phones that could allow high speed data transfers from anywhere" (¶ 1). Kaplan (2006) finds that 3G systems "provide considerably higher bandwidth than current phones, and . . . include images, Internet access, and videos" (p. 9).

Thirdly, North Americans remain strong adopters of Internet technology at the expense of mobile phones. Dholakia and Dholakia (2004) stated that Canada and the United States "are positioned relatively low in terms of mobile phone adoption" (p. 1392). This trend dates back for a decade. The United Nations Development Programme (1999), as cited in Ngini, Furnell and Ghita (2002), reported that in 1998, North America – with less than 5 per cent of the world's population – had 50 per cent of its Internet users. This figure was contrasted with that of South Asia, home to over 20 per cent of all people, but with less than one per cent of the world's Internet users.

Mobile phone diffusion is not nearly as high in Africa as in Asia. Wijayanto (2006) indicated that cell-phone penetration in Africa was just under 76 million units. But it is on the rise. Polikanov and Abramova (2003) stated that Tanzania had surpassed the United Kingdom in number of mobile operators, that mobile phones exceeded land line telephones in Rwanda and Somalia, and that "mobile communications have doubled the share of the population with access to a telephone" in Zimbabwe (p. 46). Hamilton (2003) observed the same phenomenon in Morocco,

and that almost all of the African countries have access to mobile service with many having "at least two operators, one of which is usually privately owned" (p. 125). Privatisation of the telecommunication industry is considered essential for widespread diffusion.

Mobile phones and Education

The use of mobile phones in education in Asia has increased in the last few years. Whattananarong (2005) states that "the term 'm-learning' has gained serious currency in describing wireless-enabled learning strategies and processes across the entire gamut of instructional delivery" (p. 2). Graduate students at King Mongkut's Institute of Technology, North Bangkok, used mobile phones to participate in tests, and more than 90 per cent of the participants owned the mobile phones themselves. The students sent short message service (SMS) messages to a given telephone number in order to respond to quiz questions shown on a projector screen. Student scores among the mobile phone users were the same as those of the traditional test takers. Meanwhile, Thornton and Houser (2004) studied the use of mobile phones in Japan to teach English as a Second Language (ESL). They reported that mobile phones in Japan outnumber PCs five to one, and that while 43 per cent of Japanese students use a computer to send email, 99 per cent of their subjects transmitted email on their mobiles. Thornton and Houser concluded that, in situations where class time for the courses is limited, there is a real need to provide extra-curricular learning opportunities.

In relation to SMS design, Whattananarong (2005) indicated the need for short, clear and concise data entry; and Ring (2001), as cited in Thornton and Houser (2004), advanced the idea that "Web-based course material should be decomposed into small pages that can be easily read on small mobile screens" (¶ 18). When English vocabulary lessons were set-up using the email and SMS functions of mobile phones, the students' response was overwhelmingly positive. Thornton and Houser concluded that 71 per cent of students liked receiving lessons on their mobile phones better than on the PC; 93 per cent found mobile phones to be valuable for teaching; and 89 per cent wanted to continue using their mobile for educational purposes. Learning results were positive also, with an average of 6.5 English words learned using the SMS method, compared with only 3 words learned using a PC.

More recently, Ramos, Trinona and Lambert (2006) observed that educational uses of mobile phones are increasing dramatically in the Philippines. They state that "with dropping prices and increasing functionality, it is virtually certain that not too far into the future, all students will have a cell-phone", and the University of the Philippines Open University already has formal SMS-based mobile courses in English, math and sciences. The need is discussed for development of non-formal SMS-based courses. Ramos and colleagues report that 80 per cent of students surveyed embrace the idea of learning through SMS. While the cost of an SMS message for non-formal education would be higher than that of a regular SMS, 81 per cent of the students sampled "said they would set aside a portion of their load credits to learn through SMS" (p. 74).

There is also a commitment from the government of Mongolia to developing an efficient tele-communications network (Batchuluun, 2007). Telecommunication liberalisation there coupled with partial privatisation have resulted in increased competition, and the mobile phone market has seen a huge boom. With a dispersed population as in Mongolia, mobile phones need to be explored as an educational tool. Cost is an important factor for SMS educational use, and for Mongolian adult learners, SMS is a less expensive, popular alternative to landline telephones. The English for Special Purposes Foundation (ESPF) in Mongolia has developed English units for waiters and bank tellers that via SMS messages, and has reported that 94 per cent of learners are

willing to use SMS for learning English (Batchuluun, 2007), while a majority (67%) say they were willing to spend 35-50 per cent of their SMS units for learning English. Batchuluun concludes that mobile phones "can be a vital resource in developing countries . . . The programming and development of SMS content and the cost of access must be carefully considered, and a good balance found between providing adequate learning content and charging no more than students are willing to spend" (p. 125).

The educational use of mobile phones is also gaining momentum in Africa. Visser and West (2005) wrote that in South Africa less than 11 per cent of the population owns a landline telephone whereas 90 per cent of the country's population has access to telephones due to the widespread use of cellular telephones. Brown (2003) studied the use of mobile phone support at the University of Pretoria in South Africa, and reported that mobile learning "has already started to play a very important role in e-learning in Africa," and that the growth of m-learning "has brought e-learning to the rural communities of Africa to learners that we never imagined as e-learning learners just a few years ago" (p. 11). Brown observed that responses to information provided via SMS messages were "in mass and almost immediate" (p. 9), and that, without the use of SMS, "posted information would have taken between 3 and 18 days . . . to reach all the students" (p. 9). A particular benefit reported by Brown's study was the value of bulk SMS messaging, which resulted in a saving 20 times greater than when the postal service was used to distribute information to learners. The use of mobile phones for bulk SMS mailing has also been employed in Kenya, for in-service teacher training (Traxler & Dearden, 2005). Kenya, as much of sub-Saharan Africa, has poor physical infrastructure, and in response to this problem, Kenya has developed "lively and energetic mobile phone networks." Traxler and Dearden also reported that SMS "is not frozen . . . enabling topical content and responses to emergencies and contingencies" (p. 7). The system "can be used peer-to-peer, in local decentralized groups" (p. 7), and is socially inclusive.

Conclusions

Just as North America has been the driving force behind Internet-based distance education, Asia will play the leading role in mobile learning (i.e., m-learning), particularly with respect to the educational use of mobile phones. Qiu and Thompson (2007) write that the leap in mobile phone diffusion in the late 1990s was coupled with "the impressive production capacity of Asia as the world's leading manufacturer of mobile handsets and accessories" (p. 897). In a study of mobile communication in Japan, Ito, Okabe and Matsuda (2005), as cited in Qiu and Thompson, stated that it "is more likely to be influenced by local uses and the surrounding contexts as opposed to the personal computer (PC)-based immersive technology experienced typically in the West" (p. 897). Qiu and Thompson extrapolated this argument to the entire Asian region, arguing that "Asia offers excellent cases for the exploration of something one may call 'mobile modernities' – i.e., a particular set of technological, social and cultural realities that are supplementary and antithetical to the singularly conceptualized 'Internet modernity'" (p. 898). Asia will continue to be the driving force in educational uses of the mobile phone for the foreseeable future owing to its willingness to band together under a unified digital network. The Global System for Mobile Communications (GSM) is the standard for digital mobile network in Asia. In North America, the lack of a unified digital network and the reliance on an analogue system has prohibited 3rd-generation (3G) mobile phone diffusion. GSM allows Asian learners to download "video to their cell phones from pay services, while North Americans are largely scratching their heads over the curiosity of downloading content to a mobile device" (Gizmocafe.com, 2005, ¶ 2).

There is clearly great promise for the use of mobile phones in education in Africa also. As a DE delivery mode, SMS has already proved to be cost-effective and efficient. Visser and West (2005) noted that the next generation of mobile phones "have started to include full Internet access and introduce an 'always on' cellular technology which enables the cellular telephone user to access the Internet directly" (p. 120). Two of the driving forces for mobile phone technology in developing countries will be the development of the under US $20 handset and 3G network expansion (ETForecasts.com, 2008). With increasing cell-phone penetration, the use of SMS in both formal and non-formal education can benefit learners at a fraction of the cost of other methods.

Kirkwood (1998) cautioned against letting the tail of technology wag the pedagogical dog. Internet applications in Asia can be very seductive to administrators looking to create DE courses, but they are a poor fit for the Asian region; and they are an *especially* poor fit for developing countries. Many areas of Asia and Africa are isolated from the rest of the world owing to poor geographical and physical infrastructure; and the cost of connecting these areas via the Internet is prohibitive. Dholakia and Dholakia (2004) wrote that "in regions with difficult geography or poor economic conditions, mobile networks can be designed and implemented in far quicker and cost-efficient ways than fixed networks" (p. 1393). It is vital, therefore, for DE providers in the developing world to resist the desire to adopt technology for technology's sake. Internet-based learning may be an effective method in western countries where Internet access is more prevalent, but it has not shown its worth in Asia. In Korea and China, Web-based learning has been plagued by poor instructional design, poor instructor training, poor matching of technology with learner skills, a lack of technology, and a lack of accessibility. Korea is one of the most wired nations in the world and Internet-based learning has been strongly supported in China; so the inability of these nations to develop efficient e-learning methods should act as a deterrent for the developing nations considering a move to Web-based learning.

It would be a serious disservice to both learners and instructors if Asian and African DE were to cast their lot with Web-based learning. It is an educational medium that is a poor match for all involved. Mobile phone technology is widespread, easy-to-use, and is familiar to both learners and instructors; and Asian DE has the opportunity to be the leader in the development of the mobile phone's educational uses worldwide. Mobile phone use in DE will not only benefit learners in Asia, but can be exported to other developing and developed areas around the globe. Mobile phone diffusion in Asia particularly is spreading at a dramatic rate with the advent of cheaper handsets and better services. The unified GSM mobile network allows phones to operate in different countries and to be used for sharing images, Internet access and videos; and Asian educators can now take advantage of mobile phone ubiquity by designing educational content for use on the technology. Whether in the so-called advanced countries of Asia (i.e., Korea, Japan) or in the lesser developed nations (e.g., Thailand, Mongolia, and the Philippines), cell-phone usage for learning, has proved to be beneficial for both instructors and learners, not only as a cost-efficient method, but as an effective educational tool.

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