IRRODL

THE INTERNATIONAL
REVIEW OF RESEARCH IN
OPEN AND DISTANCE LEARNING

Vol 6 No 2

July 2005

International Review of Research in Open and Distance Learning
ISSN: 1492-3831
Volume 6, Number 2.
July – 2005

Introducing IRRODL's Regional Editors: Building a relevant pathway to a global village of distance education literature

Terry Anderson, Editor
Paula Smith, Managing Editor, IRRODL

Not only is distance education multi-layered and complex, life itself is multi-layered and complex – contextualized by politics, economics, and culture. This complicates IRRODL's vision as a global e-journal dedicated to the open access dissemination of open and distance education (ODL) research, theory, and practice worldwide. How can IRRODL be everything ODL to everybody interested in ODL? How can we judge what is truly relevant in, say, China, Brazil, Mozambique, the USA, Russia, and Pakistan?

The challenge of running an international journal was made apparent during a recent IRRODL editorial meeting, IRRODL's founding editor, Peter Cookson, offered sage advice when one editorial team member suggested that the content we are publishing is designed to help those developing countries, help themselves. Although we cannot recollect Peter Cookson's reply verbatim, it went something like this: "That maybe true. But don't ever assume that you are 'helping' people in developing countries – or even that they want your help to begin with. That often is not case!"

Peter's comment rang true in this discussion and is critically relevant to IRRODL's future. It also made us think about basic communication theory as applied to the dissemination of ODL literature via open access publishing vehicles, such as IRRODL. Specifically, it made us think about the theoretical underpinnings as articulated by Harold Adams Innis and Marshall McLuhan, and what impact communications theory implies for IRRODL.

Innis, a respected Canadian political economist, was dying of cancer when he wrote a thousand page manuscript examining the social history of communication media. His final work was later was published as a triology, the most notable being *The Bias of Communication* published in 1951. Innis' final work, however, was so involved and difficult to read that *Bias* was 'archived' in the University of Toronto library with little initial attention paid (Hissey, 1988). A decade later, Marshall McLuhan came upon Innis' work and the rest is history – Innis' theory was noticed and advanced through McLuhan.

For those of you who have read *Bias*, you will see the seeds of McLuhan's groundbreaking communications theory that, to this day, hold implications for all disciplines, including Distance Education. But where McLuhan (1968) saw the dawning of a "global village," emerging via an interconnected neural network of mass communication media; Innis recognized that the introduction of new media could be used as a vehicle of oppression and cultural hegemony. Put simply, where McLuhan ultimately saw a pathway to light (global community), Innis tended to see dark (hegemony, oppression, and leading to war). They explored opposite manifestations of the same phenomena, and whereas Innis' early death cut short his work, McLuhan diligently pushed it forward to explore theoretical pathways towards utopia – McLuhan's global village. In sum, both these scholars saw new media as either beneficial to, or inimical towards, society and social structures.

While it is clearly beyond the scope of this short editorial to do more than scratch the surface of Innis' and McLuhan's theoretical frameworks, suffice it to say these Canadian communication theorists did form the germ of an idea that will drive IRRODL from this point forward. We need to draw upon expertise from many global perspectives to create a forum that reflects the cultural diversity and practice of DE on an international scale.

We are pleased to announce the introduction of IRRODL's Regional Editorial Team. These scholars, listed below in alphabetical order, were invited to serve as Regional Editors based on their rigorous dedication to the advancement of ODL research and their strong contribution to the Journal over the previous five years. And while some Regional Editorial Team members might be well known to you, it is likely many are not. For as small as the world is today, it is still a pretty big place. IRRODL's Regional Editors are not window dressing – they are dedicated scholars and practitioners committed to adding value by articulating a regional perspective. We are honoured they have accepted our invitation to serve as Regional Editors, and we are proud to present IRRODL's Regional Editors:

Rashid Aderinoye, PhD, University of Ibidan, Nigeria
Dr. Aderinoye is responsible for Central Africa and South Africa
Cengiz Hakan Aydin, PhD, Anadolu University, Turkey
Dr. Aydin is responsible for North Africa and Middle East (i.e., Morocco, Iran, Afghanistan)
Patrick Danaher, PhD, University of South Australia
Dr. Danaher is responsible for Australia, New Zealand, and Oceanana
Insung Jung, PhD, Christian Women's University, Japan
Dr. Jung is responsible for Asia Major (i.e., China, Korea, Japan)
Sanjaya Mishra, PhD, Indira Gandhi National Open University, India
Dr. Mishra is responsible for Asia Minor (i.e., India, Pakistan, Nepal)
Fredric Litto, PhD, University of São Paulo, Brazil
Dr. Litto is responsible for South and Central America and Mexico
Fred Rovai, PhD, Regents University, USA
Dr. Rovai is responsible for North America
Morten Flate Paulsen, PhD, Norgesuniversitetet, Norway
Dr. Paulsen is responsible for Scandinavia and Northern Europe (i.e., Sweden, UK, Germany)

OPEN: Eastern Europe and the Former Soviet Union
OPEN: Southern Europe

With this new decentralized editorial structure, IRRODL aims to increase its relevance to – and be reflective of – regionally localized context. IRRODL's Regional Editors will: (1) provide editorial guidance on submissions on a region-by-region basis; (2) solicit papers from their respective regions; (3) and edit a special regional-focus issue approximately every five years.
The purpose of IRRODL's Regional Editor Team structure was made clear during the 2005 Canadian Association of Distance Educators (CADE) conference in Vancouver Canada, wherein the Commonwealth of Learning sponsored several delegates from South Africa, Zambia, Namibia, and Ghana. These scholars and practitioners presented papers on topics that many of us living, working, and researching in developed countries have certainly heard about, but rarely – if ever – have personally had to deal with. These African delegates shared their experiences of delivering DE classes in Africa (e.g., remote teacher training, AIDS orphans, basic literacy, etc.) when the channels for course materials dissemination are wholly inadequate, or totally non-existent. Richard Siaciwena (IRRODL board member) said that in many African villages, DE classes are broadcast via radio – a pedagogical tactic used to overcome barriers of space and basic literacy. Moreover, because there are no schools in many African villages, radio-based DE classes are often held under a large, shady tree. And while presenting DE lessons from under the tree, curious villagers of all ages, typically drop-in unannounced. "It is not uncommon for such classes to swell from 20 'registered' students, to several dozen or even a hundred 'unregistered' students," said Richard. "But these people are just as intent on learning as the 'registered' students." What Richard described at the CADE conference is the DE experience throughout many regions in the world. And this is exactly why IRRODL must pay heed to the warnings of Innis (and Peter Cookson) and this is why we must continually strive to be sensitive to academic rigor and literature dissemination on a region-by-region basis – with the vision of building a global village of distance educators. Indeed, if one is teaching basic literacy skills to villagers from under a large, shady tree, it is perhaps not too much of a technological fantasy to imagine these students accessing content and interacting with others via mobile cell phone technology under that tree? But regardless of the media, IRRODL's content must be relevant to the audience for which it is intended on a region-by-region basis – whether it is disseminating literature on qualitative content analysis, a comparative analysis of asynchronous and synchronous distance delivery, exploring the emerging role of m-learning, or teaching basic literacy via radio to students under a tree.

Introducing Cider Notes

In this issue of IRRODL, we have five Main Section papers, three Book Reviews, and four Technical Note reviews. For those of you with adequate bandwidth, we have cross-linked to an archived series of live audio-graphic presentations called CIDER Sessions, which were sponsored by the *Canadian Institute for Distance Education Research* and *Elluminate*, and held online in Spring 2005. While this research hails from Canada, we feel this work holds value for ODL researchers and students around the world. These CIDER Sessions are: 1) Distance Education Research, Design-based Research and the CIDER Solution; 2) Research on Formal Virtual

Learning Communities in Higher Education; 3) Content Analysis of Online Asynchronous Discussions; 4) Learning Object Repository Network; 5) Investigating How Technology Innovation is Decided and Implemented in an Inter-organizational Collaboration; 6), Affect as a Presence in the Community of Inquiry Model; 7) e-Learning 2.0; 8) Games as Learning Environments: Research strategies and issues. We hope you will be able to download the free JAVA engine and JAVA applets from *Elluminate*, and sample these hour long CIDER Sessions.

The Main Section

In this issue, we start with an insightful paper: *An Assessment of the Academic Achievement of Students in Two Modes of Part-time Programme in Nigeria* by Kola Adeyemi and Austin Osunde at the University of Benin. These authors report on a post-hoc study that analyzed the academic achievement of outreach and on-campus students at three dual-mode Nigerian universities. Adeyemi and Osunde wrap up with several suggestions for improvement.
Next in *Increasing Access to Higher Education: A study of the diffusion of online teaching among 913 college faculty*, The State University of New York's Peter Shea, Alexandra Pickett, and Chun Sau Li, report on research on American professors engaged in dual mode distance education delivery. The purpose of this work is to determine barriers to adoption of online teaching in dual mode college and university contexts.

University of Ottawa's Colla J. MacDonald and Terrie Lynn Thompson report on an analysis of e-Learning experiences using the Demand-Driven Learning Model (DDLM) to evaluate an online Masters in Education course, in their paper: *Structure, Content, Delivery, Service, and Outcomes: Quality e-Learning in higher education*. Using multiple data collection methods, they find that all five dimensions of the DDLM model must work in concert to implement a quality e-Learning course.

In *Navigating Distance and Traditional Higher Education: Online faculty experiences*, Alice G. Yick, Pam Patrick, and Amanda Costin from Capella University in the US, report on a qualitative study designed to explore faculty members' experiences in a DE, online university vis-à-vis the traditional environment of higher education. Explored are issues such as tenure, professional practice, program development, and policy.

In *Selected Topics from a Matched Study between a Face-to-face section and a Real-time Online section of a University Course*, Mia Lobel and Randy Swedburg of Concordia University, and Michael Neubauer, Stanford University, report on a matched study designed to compare interaction of two groups of students studying the same course, one enrolled in an online section using LBD eClassroom©, and the other in a face-to-face section.

Our final Main Section paper: *Identifying Sources of Difference in Reliability in Content Analysis*, by Elizabeth Murphy and Justyna Ciszewska-Carr, Memorial University of Newfoundland, Canada, complements CIDER Session #3: Content Analysis of Online Asynchronous Discussions. In this paper, the authors discuss important reliability issues involved in quantitative content analysis of transcripts of online asynchronous discussions.

Book Notes

This issue features three book reviews of recent DE publications. Lending his expertise in leadership issues in distance education, Don Olcott Jr. reviews: *Reflections on Research, Faculty and Leadership in Distance Education*, edited by Michael F. Beaudoin. Next, Erin Keough brings her insights on technology application to her review of *Distance Education and Technology: Issues and Practice*, co-edited by David Murphy, Ronnie Carr, James Taylor, and Wong Tat-meng. Finally, Stacy Ludwig reviews the latest volume from the Oldenburg series *Learner Support in Open, Distance and Online Learning Environments*, co-edited by Jane Brindley, Christine Walti, and Olaf Zawacki-Richter.

Technical Notes

We wrap up this issue with four installments of the popular Technical Notes section which examine 1) a comparison of Wiki products; 2) rubrics and exemplars in text-conferencing; 3) learning objects and instructional design; and 4) optimizing synchronous conferencing freeware.
We hope you will enjoy and benefit from this latest issue of IRRODL, and we trust you will continue to visit and reference previous issues of IRRODL. And we trust that you will subscribe to IRRODL so you can continue to grow and learn and expand your horizons with us.

Terry Anderson, Editor
Paula Smith, Managing Editor
Edmonton, Canada, June 30, 2005

References

Hissey, L. (1988). *History of Communication Theory*. Burnaby, BC: Simon Fraser University.

Innis, H. A. (1951). *The Bias of Communication*. Toronto: University of Toronto Press.

McLuhan, M., and Fiore, Q. (1968). *War and Peace in the Global Village: An inventory of some of the current spastic situations that could be eliminated by more feedforward.* New York: Bantam.

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

An Assessment of the Academic Achievement of Students in Two Modes of Part-time Programme in Nigeria

Kola Adeyemi and **Austin Osunde**
University of Benin
Nigeria

Abstract

This study analyses the academic achievement of students enrolled in part-times studies at on-campus and outreach centres at three dual-mode Nigerian universities, during the 1996/97 to 1998/ 99 academic years. Research subjects in this study were examination and record officers employed by on-campus and outreach institutions. A checklist was prepared to collect students' grades; these checklists were then transcribed into grade points (GPAs) for data collection purposes. Simple percentage mean (x) and t-test statistic were used for data analysis. Interviews were also conducted with key stakeholders to add qualitative context to the quantitative data collected. This study shows that there was significant difference in the academic performance of students enrolled in the on-campus versus outreach-based, part-time programmes in selected disciplines. Also the average mean (x) performance of students enrolled in the on-campus programme was higher than those students enrolled in the outreach centres. Based on the findings of this study, it is recommended that the government provide adequate funding to increase access individuals seeking higher education in Nigeria. The establishment of functional Open University system is also recommended to provide students with distant learning opportunities and likewise increase access. Several quality improvements are likewise recommended: the use of modern information technology for instructional delivery, recruitment of skilled teachers, improved teaching/ learning facilities, and strict adherence to standardized student admission requirements as specified by the National Universities Commission (NUC). We wrap up with practical suggestions, such as providing orientation sessions for outreach students to learn practical skills such as how to access library materials.

Keywords: academic achievement; part-time programmes; on-campus; outreach; distance education; quality assurance; Nigerian universities; students

Introduction

Two types of part-time degree programmes are offered by Nigerian universities: on-campus and those offered via outreach programmes. The on-campus, part-time programmes are offered at main campuses; outreach programmes are offered at satellite outreach centres, often located many kilometres from the parent campus, typically in large commercial urban centres. To gain entry into part-time programmes of study, in theory part-time students must meet the same admissions requirements as their full-time student counterparts. On-campus students studying part-time are

taught by regular faculty, use the same facilities, and attend lectures during the evenings, weekends or vacations, as fulltime students studying on-campus. Outreach or satellite programmes, on the other hand, offer part-time programmes that are administered and delivered at designated 'outreach' centres that are physically located off-campus, outside confines of the parent institution. Outreach centres are typically located in large urban and commercial centres, so as to attract students who could afford to pay for their academic upgrading and education. These outreach centres, however, tend not to be as well equipped compared to their parent universities. Moreover, those hired to teach outreach programmes are typically recruited from outside the parent university's faculty.

The National Universities Commission (NUC) admission requirements are the exact same for both the on-campus and outreach programmes. Both programmes are to teach the same curriculum, use the same course syllabi and course contents, and administer the same examinations as used in 'mirror' programmes offered in the regular university system. All programmes of study are moderated, controlled, and approved by the senates of their respective operating universities. It is safe to assume, therefore, that there are standardized quality control measures in place that warrant the award of the same degrees and certificates to successful graduates of these programmes.

In reality, however, this is not the case. Indeed, there are currently many contentious disagreements among academics, experts, and critics as to the *modus operandi* and quality of education of part-time programmes offered through Nigeria's higher education system. Madunabum (1997), for example, opines that part-time – and especially out-reach programmes – are inferiors due to their mode of operation and commercial aspects. Such criticisms of Nigeria's outreach programmes range from awkward lecture times, large number of students, and lack of qualified academics/ lecturers needed to teach outreach courses. Such 'substandard conditions' are typically tolerated by the public, however, primarily because outreach centres are operated under the umbrella of the parent university, and hence tend to have an aura of legitimacy about them. The fact still remains, however, that outreach centres are typically looked upon as inferior to 'real university programmes' by the general public. They believe that the quality of lecturers recruited to teach in these centres to be 'questionable,' along with the quality of instruction and course dissemination – observations that echo findings from this research study. It was found that Nigeria's outreach facilities are substandard and that the parent universities often do not exercise direct day-to-day supervision of their centres. They are extremely commercial, and many critics argue that they may trade-off academic excellence expected of normal university degree programmes in order to get paying students through the door. Obemeata (1999) for example, notes that admission requirements approved by the appropriate authorities have been unilaterally relaxed so they can enrol more and more students. In addition, Falua (1989) found that across Nigeria, outreach classes were overcrowded and that little tangible consideration was paid to lowering the lecturer-to-student ratio – conditions which he says could negatively impact truly effective teaching and learning.

These criticisms – especially those made against out-reach programmes in recent years – have resulted in government's 2001 directives to the National University commission (NUC) through the Federal Ministry of Education, which reported: ". . . the Federal Executive Council at its sitting . . . considered the report on the verification visits to satellite campus and out-reach centres of existing universities . . . and concluded that all campuses and study centres be closed" (Federal Ministry of Education, 2001). Operators of the outreach centres, however, refute these criticisms with the claim that the quality of programming offered to outreach students is not substandard vis-à-vis on-campus students enrolled in traditional part-time programmes. To support their claims, outreach administrators point to the 'superiority' of the facilities used to support course delivery – especially the instructional aids used. They also claim that they use the same course

syllabi, use the standardized courses, and administer the same course examinations as their parent universities. They also cite the 'fact' that they are moderated and approved by their parent university's senate. But is this actually the case?

In the mid 1990s, a similar debate surfaced in Europe, which focused on quality and standards. This debate compelled the Socrates Programme of the European Commission to fund a year-long research study in 1997 entitled: "Making it work: European Universities and Lifelong Learning" (Taylor, 2001). The European study analysed the extent to which lifelong learning and practices were, in fact, were being practised in universities in four European countries: the Netherlands, Germany, Finland, and the UK.

Guided by the premise that technologically-driven change will result in the development of a "knowledge-based society," this study found that focus on continuous learning and retraining for all Europeans must be a top priority to ensure Europe's economic competitiveness and prosperity in the global economy (Taylor, 2001). Moreover, Europe's educational system must not only be perceived as open and flexible – it must in actual practice be open and flexible. As a result of this study, countries across the European Economic Union – and particularly those countries in this study – have proactively increased student access to open and distance education, primarily through the use of new educational technologies.

The European study also reported that emphasis on quality and quality control across the economy has been pervasive – some would say obsessive – in the 1980s and 1990s. The fact remains, however, that monitoring of 'quality' in higher education is notoriously difficult, if only because of various quality approaches to higher education. In a country like the UK, however, its educational system has evolved a complex quality assurance bodies, all of which are quasi-autonomous organisations established from within the higher education system itself. According to Taylor, as competition increases between higher education institutions for external 'customers,' quality assurance issues are likely to assume even greater, more central importance.

While investigations into student performance in educational institutions may not be new or novel, the authors of this particular study argue that it is unique and important because it critically examines part-time programmes operated on-campus and in outreach centres operating in Nigeria. The finding from this research study, therefore, offer educational researchers concrete data upon which to compare and contrast on-campus and outreach part-time degree programmes in terms of their societal relevance in developing countries, as based on students' actual academic achievement. To determine if (and what) differences exist between these two programs, questions must be asked regarding the ongoing desirability of part-time and outreach programmes, and the actual quality of instruction vis-à-vis students academic achievement. These questions are:

1. What is the desirability of the two programmes?

2. What is the academic achievement of students in these programmes?

3. Is there difference between the academic performances of the students in the two programmes?

To find answers, the following research question was answered and a hypothesis tested: *What is the level of compliance to the NUC minimum standard by the on-campus and outreach organised part-time programmes?*

Ho1: There is no significant difference in the academic achievement of students enrolled in the on-campus and outreach part-time degree programmes.

Rationale for Part-Time Education in Nigeria

To satisfy individuals' quest for knowledge, and cope with growing societal-demands by school leavers and adult workers seeking more opportunity to actively participate in Nigeria's future, there has been a surge in demand for university-level education in recent years (Adeyemi, 2001; Nwadiani, 1993). In response, there has been significant expansion of Nigeria's university system, as witnessed by the establishment of 36 publicly-funded universities, and three privately owned universities (National Population Commission, 2000). Such development can be seen as phenomenal in the sense that Nigeria's university system has grown from only one university in 1960, to six in 1970, to 13 in 1980 (National Universities Commission, 1981), to 36 new universities by 2000. Student enrolment has also increased dramatically. For instance, enrolment was 77,791 in 1980; 172,463 in 1990; and 253,121 in 1996 (NUC, 1989; 1990; 1997).

The above figures, however, constitute only a small fraction those individuals actually seeking higher education; the fact remains that for all those who have applied and passed the university entry matriculation exams, space remains limited and only a lucky few can be enrolled in university-level studies (Obemeata, 1999; Omoregie, 1999). According to Nwadiani (1993), between 1980 and 1990, 1,887,576 Nigerian citizens applied for entrance into university, while only 316,528 (16.8%) were admitted, thereby leaving the remaining individuals (82.2%) stranded, without access. This arguably dismal statistic can be compared to UNESCO's findings, which showed a huge increase in university-level student enrolment in developed countries in the 18-23 age group – which jumped from 15.1 percent in 1969; to 21.7 percent in 1979; to 30.7 percent in 1980; to 40.2 percent in 1991. UNESCO predicts a sizable increase in student numbers enrolled in higher education worldwide – from 65 million in 1991; to 79 million in 2000; to 97 million in 2015; and 1000 million by 2025 (Taylor, 2001).

Increasing demand and the recent and unprecedented expansion of its higher education system has placed tremendous pressure has been placed on the government's shoulders to fund all levels of higher education in Nigeria (Adeyemi, 1995; Ejiogu, 1997). Unfortunately, due to an economic recession that is currently crippling the country's economy, government funding for Nigeria's universities has dwindled dramatically. Current economic conditions have forced the government to issue directives their universities, asking them to generate additional funds internally (i.e., for-profit courses) to help finance basic university programmes.

Thus, the double-edged need to increase access to higher education AND generate much needed revenue has informed the intent, development, and ultimately the introduction of current part-time programmes of study offered by Nigeria's university system. According to Obemeata (1999) and Afe (1999) the expansion of part-time programmes must aim to accommodate both students seeking a university degree, as well as provide on-the-job training opportunities for those individuals who require new skills and/ or academic upgrading. In chronicling the relevance of outreach part-time programmes, Akintayo (1990) concluded that due to under-utilization of resources (i.e., physical capacity), coupled with increasing student demand for access to higher education opportunities, university's must implement outreach programmes to address growing demand. Similarly, Rumble and Harry (1982), Jianshu (1988), McIsaac, Murphy, and Demiray (1988), Bernard and Amundsen (1989), all agreed that open access to distance learning programmes will improve student access to higher education.

The need to accommodate thousands of Nigerians yearning for a university education formed the crux of discussions between the Joint Admission and Matriculation Board (JAMB) and the Commonwealth of Learning (COL) during the World Education Market in Vancouver, Canada (The Guardian, 2001). Faced with ever increasing demand for higher education across Nigeria,

(e.g., over 700,000 Nigerians applied to attend university during the last university matriculation examination), JAMB's registrar, Prof. Bello Salim voiced his concerns to COL's president, Gajaraj Dhanarajan, that increased access to distance learning education opportunities was essential to Nigeria's future welfare (The Guardian, 2001). Prof. Bello Salims' concerns are reflected in hard numbers. In 1999/ 2000 approximately 460,000 Nigerians wrote the UME; and in 2000/ 2001 over 700,000 in 2000/2001 wrote the UME – of which only about 10 percent of will eventually get placed. Prof. Bello Salim: "I am deeply worried about those young boys and girls who desire to study in our universities will, unfortunately, have access to limited spaces" (The Guardian, 2000, June 28, p.42).

In 1984, an attempt was made to address problems of access when an Open University was established to offer distance and part-time degree programmes. These programmes, however, were discontinued in 1985 due to unstable political considerations. The present government, however, is resurrecting Nigeria's distance and part-time educational system, as witnessed by the dramatic expansion of access to university education in recent years.

The need of raising alternative sources of revenue (to supplement government funding) has resulted in a dramatic increase in part-time programmes offered by many universities (Obemeata, 1999). These part-time programmes are offered on a 'for-profit' basis, which in turn financially subsidize regular students enrolled in Nigeria's federal universities, who are required to pay tuition fees. Nonetheless, Briner and Pauli (1971) as cited in Omoregie (1999) saw the implementation of part-time programming as a viable strategy to increase access to those desirous of higher education. In sum, according to these academics, if a society or a political system fails to offer its people access to basic and higher education, the whole population suffers.

Method of Study

This descriptive study used an *ex post facto* design. At the time of this study, there were 36 state and federal government owned universities in Nigeria. All 36 universities operated one form of part-time degree programme, either university-based (on-campus) or satellite-based (outreach). Only 12 universities, however, operate both on-campus and outreach programmes. It is these 12 dual-mode universities that formed the population of our study. These 12 dual-mode universities were then further divided into three sub-groups: (1) first generation universities (established before 1970); second-generation universities (established between 1971 and 1983); and new generation universities (established from 1985 onward) as classified by the National Universities Commission (NUC). From each generation, one university was randomly selected. In total, three universities were randomly selected for our study (25 percent of Nigeria's dual mode universities).

One thousand students were then selected from each of the programmes (on-campus and outreach), translating to 200 students per discipline studied (five disciplines in total). The five disciplines selected for the study – Public Administration, Accounting, Computer Science, Business Administration, and Technical Education – were chosen because they are the most sought after disciplines and most universities offer these programmes in both on-campus and outreach modes. It should also be noted here, however, that most part-time programmes are geared towards the delivery of management-type courses, because such courses are less cost-intensive to design and deliver compared to science courses, which are obviously more expensive (i.e., no need for laboratories and workshops). In addition, management courses are relatively easy to administer and teach both on-campus and at the outreach centres. Finally, current market conditions are such that many Nigerians are actively seeking out managerial courses, so they can work in big multinational companies and make big and quick money. Hence, at present there is a

huge demand for these types of courses. Additionally, based on pure pragmatics, because part-time programmes generate much needed revenue, universities are very keen in increasing access to areas of education that can attract more students and hence more money to underwrite their overall activities.

Finally, it is important to note that this study covered the 1996/97 to 1998/99 academic years. An *ex post facto design* was used because growing labour unrest throughout Nigeria's university system has resulted in interrupted academic years. As such, these particular years were analysed because they were complete and thus yielded more reliable data.

We prepared a standardized checklist to collect student score data. We then asked the examination and records officers employed by the three universities and outreach centres in our study, to populate these checklists with student scores. Data from the checklists (students' scores) were then translated into grade point averages (GPAs), as based on criteria established by the National Universities Commission's (NUC) guidelines (see Figure 1). To flesh out our quantitative data with qualitative data, staff and participants in the programmes were interviewed on the relevance, desirability, and sustainability of their respective on-campus or outreach programmes, using semi-structured interviews. The interviews were used to provide qualitative context to the quantitative data collected. The GPAs of students enrolled in the various programmes were compared to determine whether statistically significance differences existed between them. In other words, the academic performance of the randomly sampled students enrolled the five selected disciplines in both on-campus and outreach programmes of study were statistically compared.

Table 1. GPAs as based on criteria established by the National Universities Commission's (NUC) guidelines.

A	=	70% and above	=	5 points
B	=	60 - 69%	=	4 points
C	=	50 – 59%	=	3 points
D	=	45 – 49%	=	2 points
E	=	40 – 44%	=	1 points
F	=	0 – 39%	=	0 points

Source: NUC Approved Scoring and Grading System, University of Benin (Internal Memorandum July 22, 1991)

The NUC has determined that the following factors can impact on student academic achievement. These factors are: teaching manpower; quality of instructional delivery; entry requirements; facilities/ equipment; course contents and mode of assessment. From these factors, the NUC developed 'minimum operational standards' that must be met in delivering degree programmes and in awarding degrees. The NUC parameters for minimum standards in Nigerian Universities are as follows:

1.(a) Teaching manpower: professorial (20%); Senior Lecturer (35%); other (45%)

(b) Teacher/ Student ratio: ranged between 1:24 for Education courses to 1:10 for Medical Sciences, Sciences, Engineering, Pharmacy, and Agriculture.

(a) Academic staff/ Academic support staff ratio:

- One senior administrative staff to 12 academic staff
- One senior technical staff to 20 academic staff
- Two junior non-technical staff to three academic staff (for all academic departments and units).

Based on this NUC's minimum standards cited in Table 1, this study assumes that quality of instructional/ educational delivery of will be determined by the prescribed NUC's minimum standard ratios above.

2. **Library Facilities:** The NUC prescribes a minimum standard for library services, with adequate number of books and journals for university departments and faculties.

3. **Entry Requirements:** The NUC recommends five credit pass (including English and Mathematics) at Ordinary Level, and at least a one credit pass at Advanced level or other related certificate for direct admission to any 5-year or 4-year degree programme respectively. Admission requirements for the part-time programmes (on-campus and outreach) are flexible for mature candidates over age, which is 35 years and above.

4. **Instructional Facilities/Equipment:** The NUC prescribes a minimum standard for laboratory, workshop, accommodation, recreation, lecture room/halls, etc.

5. **Course Contents:** Curricula appropriate to class/ level are determined by the senate of the various universities.

6. **Mode of Assessment:** NUC prescribes ac course of continuous assessments, tests, and examinations of the modes of student assessments.

Based on these minimum standards, the following values were used to rate the compliance level of the outreach centres and the on-campus programmes.

* Very good - 5 points
* Good - 4 points
* Fair - 3 points
* Poor - 2 points
* Very poor - 1 point

A questionnaire that focussed on the NUC parameters was developed and administered by the researchers through personal visits to the institutions. Data and information obtained were analysed by using simple mean, percentage and *t*-test statistics.

Testing Institutional Input Factors and Students Academic Achievement

Research Question: *What is the level of compliance to the NUC minimum standard by the on-campus and outreach organised part-time programmes?*

Answers to this question are in Table 2.

Table 2. Rating of Academic Performance induced Factors Based on NUC Minimum Standards (Level of Compliance)

	Factors	Univ. 1		Univ. 2		Univ. 3	
		Ocp	Op	Ocp	Op	Opc	Op
1	Teaching manpower	4	2	3	2	3	1
2.	Quality of institutional delivery	3	1	4	2	2	1
3.	Entry requirements	4	2	4	2	3	2
4.	Instructional facilities/ equipment	4	1	3	1	3	1
5.	Quality of course contents	4	3	4	2	4	3
6.	Mode of assessment	4	2	3	3	4	2

Note: Figures in parenthesis represent percentage response rating
Ocp = On-campus programme
Op = Outreach programme

As based on the NUC's minimum standards for academic performance factors, the data presented in Table 2 shows that neither the on-campus or outreach programmes met the NUC's minimum standards. Moreover, a consistent rating pattern between on-campus and outreach programmes can be noted – with the on-campus programmes showing more favourable results than 'same/ similar' programmes offered by the outreach centres.

These findings indicate that the teaching/ learning processes use in these programmes do not meet the minimum standards as set by the NUC, which in turn, may negatively impact student achievement. These findings also show that on-campus students tend to learn more and perform better academically than their student counterparts enrolled in the outreach centres. To address this position the following hypothesis was tested.

Hypothesis: *There is no significant difference in the academic achievement between students in the on-campus and outreach part-time programme.*

Table 3. Summary of *t*-Test Analysis of the Students Academic Achievement between On-campus and Outreach Part-time Degree Programmes

S/N	Degree Courses	On-Campus			Out-Reach			Calculated
		N	SD	$\bar{X}$	N	SD	$\bar{X}$	t-Value
1.	Public Administration	200	14.61	42.10	200	11.76	36.84	14.61
2.	Accounting	200	16.48	62.42	200	21.98	64.36	-18.86
3.	Computer Science	200	10.53	48.52	200	12.90	40.12	24.71
4.	Business Administration	200	10.50	44.12	200	8.75	35.72	27.10
5.	Technical Education	200	9.34	43.96	200	7.66	32.81	38.45

All t-values are significant at $P < .05$.

Table 3 above shows the calculated *t*-values for the degree courses (Public Administration at 14.61; Accounting at -18.86; Computer Science at 24.71; Business Administration: 38.45) are greater than the table/ critical value of 1.96 at alpha level of .05. Therefore the hypothesis, *There is no significant difference in the academic achievement between students in the on-campus and outreach part-time programme,* is rejected. From this finding, it can be logically concluded that there is a significant (negative) difference between in the academic achievement of students enrolled in the on-campus and outreach centre-based part-time programmes in the disciplines selected for this study.

Discussion

This study shows that there is a significant gap between supply and demand for higher education throughout Nigeria. It also shows that there is logical justification for expansion of Nigeria's higher education system and that the part-time, degree granting programmes do play a significant role in addressing societal demand for access to higher education. This finding echoes similar developments found across the globe (Asmal, 2000; Taylor, 2001).

Our study has revealed, however, that the *standard or quality* of learning, as currently on offer in the both part-time on-campus and outreach centres could hamper effective teaching/ learning. Moreover, the part-time programmes offered through the outreach centres were found to be inferior to similar/ same part-time programmes of study offered on-campus, with the exception of Accounting. In sum, the level of compliance to the minimum standard set by Nigeria's quality control agency for the university education (NUC) was found to be below average for both programmes (see Table 3). While the standards of the on-campus programmes were superior to that of the outreach centres, they too remained below national standards.

Unfortunately, the lack of a coherent and reliable information technology infrastructure does not help matters, particularly in the area of knowledge dissemination and information distribution, especially as flowing from the university campuses to their respective outreach centres. These are critical technological issues that impact seriously on student learning, and by logic, could likely translate into lower/ substandard academic performance.

Our findings also showed that students enrolled in the on-campus, part-time programme performed better than their counterparts in the outreach centres, with the exception being

Accounting, which recorded a higher mean score in the outreach centres. This finding, however, could be explained by the fact that experienced professionals (i.e., Chartered Accountants) are typically hired to teach in the outreach centres on a part-time basis. Moreover, 'teacher retention rates' for those teaching accounting on university campuses tends to low, so less experienced professionals make up the ranks of the on-campus lecture workforce (Adeyemi, 2000). Indeed, most accountants typically opt for better-paid employment scenarios in Nigeria's banks, oil companies and other industries – and these are the skilled accounting professionals that typically teach in outreach centres. It is not surprising, therefore, to see the mean performance for Accounting courses taught in the outreach centres to surpass those of the on-campus Accounting programmes, simply because these outreach courses are taught by 'gurus' currently working in the field.

For the remaining four programmes in this study, on-campus students (as seen in the mean scores) performed better than their counterparts studying the same courses at outreach centres. This finding suggests that on-campus university environments provide more conducive teaching/ learning environments and yield (albeit still below standard) better academic performance as seen in the mean scores. Regular university faculty also teach the part-time on-campus courses. These experienced teachers and lecturers have more access to – and arguably more familiarity with – the larger array of campus-based facilities such as libraries, lecture rooms, etc. Part-time students' studying on-campus also have more informal contact with their full-time student counterparts – a process of 'academic osmosis' that enhances student learning, an observation that has been corroborated by Obemeata (1999) who noted that students typically learn better through informal discussion among themselves.

Although the entry requirements for both programmes are the exactly the same, our investigations revealed that the NUC's admission procedures at the outreach/ satellite campuses are abused. This finding may explain why government ordered the closure of outreach/ satellite programmes. In sum, differences found in student performance in the two programmes may be attributed to adulterated admission processes. The low mean performance by students enrolled in the outreach centres seem to confirm the fears raised by Madunabuan (1997) and Falua (1989), who questioned the quality of knowledge dissemination and educational facilities available in the outreach centres, which they say operate well below national standards. Clearly, this could negatively influence learning outcomes.

This study showed significant differences exist between the academic achievements of on-campus and outreach students. This finding is not surprising, however, owing to the fact that the two programmes operate in distinct, different teaching/ learning environments, many conditions of which were described in greater detail earlier. Nonetheless, students enrolled in the on-campus part-time programme were also found to be armed with better academic orientations and exposures than their outreach counterparts, a finding that suggests that base-line entry requirements are lower for outreach students.

Based on the above findings and discussion, critics who find part-time programmes lacking – especially those in outreach centres – are typically met by counter-arguments of those critics who say the trade-off (lower standards) is worth turning a blind eye to NUC minimum standards. Nonetheless, the findings of this study do support the fears raised by Madunabum (1997), who asserted that quality programming is central to producing quality graduates, and that graduates tend to reflect the quality of intakes and their learning environment – and that Nigeria's part-time programmes, offered on-campus and through outreach centres, are producing inferior graduates. Our findings may also offer an explanation for the federal government recent decision to suspend operations at the outreach and satellite centres until restructuring is complete. The pressing need to dramatically increase access to higher educational opportunities, however, does seem to be

outweigh concerns raised by critics of the outreach centres and the findings of this study – in particular, those programmes that aim to train and educate mature candidates who may not be well equipped to participate academically and may, by necessity, require more flexible, open access to upgrade education.

Limitations

While the finding of this study are persuasive, the study itself holds limitations. Several extraneous factors that could influence our finding were not within the scope of this study. Such factors include: learning environment, especially for outreach programme, facilities available, quality of staff, period of study, etc. For further research, it is suggested here that similar studies can be carried out at the polytechnics and colleges of education levels, since they also operate the on-campus and outreach programmes.

Conclusion and Recommendations

Owing to growing demand for university education, part-time programmes and other forms of distance education alternatives designed to increase student access to higher educational opportunities in Nigeria are indispensable. As this study clearly shows, however, increasing access may result in the provision of substandard facilities and less than optimal teaching situations. Clearly, failure to adhere to the basic minimum standards established by the NUC will likely produce inadequately prepared graduates – those very people who need quality skills and knowledge to guide Nigeria's future social and economic development. This study also found significant differences in academic performance of those students enrolled in the part-time on-campus and outreach programmes. This finding is explained by difference in quality of the two programmes (e.g., type of faculty and facilities used).

Findings from this study warn of serious implications for Nigeria. While it is evident that Nigeria must dramatically increase access for its growing population so they and the nation can benefit from opportunities afforded by a higher education, this takes money combined with strategic planning to make it happen. As such, the call is made here for all stakeholders – governmental, public, and private sector – to increase funding, so both meaningful and strategic expansion of existing facilities (on-campus and outreach) can be achieved to deliver the quality of instruction need to meet the NUC's basic minimum standards.

To expand access, Nigeria's governments must act quickly to establish an integrated, high-quality open university system (i.e., a system comprised of distance learning programmes, outreach programmes, and on-campus programmes of study). It is also suggested that an overarching quality control agency independent of the NUC be established to review, monitor, and guide the activities of the various part-time, distance, and outreach programs that currently operate under the purview of Nigeria's various public and private university senates. Minimum standards monitored by this proposed independent quality control agency should include: teaching/ learning facilities; admission requirements; quality of faculty/ lecturers; and student to faculty ratios.

Nigeria – like many nations across Africa and throughout the developing world – also lags behind developed nations in terms of infrastructure to support learning technologies. Nigeria's major telecommunication carrier (NITEL) is largely inefficient; continued private multinational participation in the funding and provision of information technology could therefore be of immense assistance to Nigeria's long term development.

Students enrolled in outreach centres should be provided more access (e.g., orientation sessions) with their parent universities, which will enable them to learn how to access on-campus facilities such as libraries and workshops. If, and where possible, examinations should be conducted on the main campuses of the parent universities. In terms of admission requirements, it is suggested that the university admission criteria be rigidly applied to all potential applicants. Nonetheless, the fact remains that because many part-time programmes aim serve the educational needs of mature learners, and as such, flexibility in admission are essential so as not to impede access. Therefore, remedial learning programmes should be put in place to help mature learners obtain the basic skills and knowledge they need to become rigorous students, and true contributors to Nigeria's future.

Finally, more attention must be paid to the expansion and development of other tertiary forms of higher education (e.g., polytechnics, monotechnics, vocational institutions, and other professional colleges) in order to expand access to higher education.

These suggestions are imperative as Nigeria joins the rest of the responsible global family in increasing access to education at all levels, and to provide the qualitative manpower to cope with the over-increasing areas of human developmental endeavours.

References

Adeyemi, J. K. (1995). "An analysis of resources allocation and productivity level of Secondary education in Nigeria" *Nigerian Journal of Professional Studies, 3*(1), 4 – 6.

Adeyemi, J. K. (2000). "Academic manpower needs of nigerian universities" *Higher Education Review, 32*(2) 36 – 44.

Adeyemi, J. K. (2001). "Equality of access and catchment area factor in university admissions in Nigeria" *Higher Education, 42*(3) 307 – 332.

Afe, J. O. (1999). "Teacher education part-time programme in Nigeria: History, rationale, problems and prospects" In Oshodin O. G., Ehiametalor, E. T., and Awanbor, D. (Eds.) *Teacher Education Part-Time Programmes in Nigeria.* Benin City, Nigeria: University of Benin Publishers, 7 – 12.

Akintayo, M. O. (1990). The relevance of outreach programmes to capacity under-utilization of resources in higher education in Nigeria in the '90s. *The Educational Planner, 1*(3/ 4), 89 – 103.

Asmal, K. (2000). Characteristics of elements of a lifelong learning higher educational institution. Ministerial speech, conference on *Lifelong Learning, Higher Education and Active Citizenship*, Cape Town, South Africa, October 10-12. Hosted by UNESCO and Danish National University of Education.

Brimner, M. A., and Pauli, l. (1971). *Wastage in Education: a world problem.* Paris: UNESCO/ IIEP, 9.

Bernard, R. M., and Amundsen, C. L. (1989). Antecedents to dropout in distance education: does one model fit all? *Journal of Distance Education,* 1(2), 25 – 46.

Ejiogu, A. (1997). The changing fortunes of higher education in Nigeria. In A. Ejiogu and K. Ajayi (Eds.) *Emergent Issues in Education, 2*. Lagos, Nigeria: University Consult.

Falua, O. (1989). Continuing education or mis-education centres: an absolution of the problem of underachievement among Nigerian students. *African Journal of Educational Management, 3*(1), 67 – 74.

Federal Ministry of Education (2001). *Closing of outreach Centres and Universities' Satellite campuses.* A Federal Government Circular to all Universities and other related institutions. Abuja: Federal Ministry of Education.

Jianshu, Z. (1988). The development of higher distance education in China. *Developing Distance Education,* 450 – 452.

Madunabum, M. A. (1997). In-service education a neglected dimension of the professional development of the Nigerian science teacher. *West African Journal of Educational Research,* 1(2), 183 – 186.

McIsaac, M. M., Murphy, K. L., and Demiray, U. (1988) Examinating distance education in Turkey. *Distance Education, 9*(1).

National Population Commission (2000). *Annual report,* Abuja, NPC.

National Universities Commission (1981). *Annual report,* Abuja, NUC.

National Universities Commission (1989). *Annual statistical digest* (1980/81 – 85/ 86). Abuja, NUC.

National Universities Commission (1990). *Annual report*, Abuja, NUC.

National Universities commission (1997). *Statistical information on Nigerian universities.* Abuja, NUC.

Nwadiani, M. (1993). Planning higher education in Nigeria in the '90s and beyond: Rationale and challenges. *Journal of Higher Education 16*(2), 283 – 292.

Obemeata, J. O. (1999). Part-time Programmes: Concept and development in Nigeria. In O. G. Oshodin, E. T. Ehiametalor, and D. Awanbor (Eds.) *Teacher Education Programmes in Nigeria*, Benin City: University of Benin Publishers, 1 – 6.

Omoregie, O. S. B. (1999). Teacher education part-time programme in Nigerian tertiary institutions as strategy for arresting wastage in education. Benin City: University of Benin Publishers.

Oshodin O. G., Ehiametalor, E. T., and Awanbor, D. (Eds.) *Teacher Education Part-Time Programmes in Nigeria.* Benin City, Nigeria: University of Benin Publishers.

Rumble, G., and Harry, K. (1982). *The distance teaching universities*. London: Groom Helm.

Taylor, R. (2001). Lifelong Learning in Higher Education in Europe: Myth or reality? *Adult Education and Development, 56,* 127 – 146.

The Guardian (2001). *COL discuss distance learning.* June 28. Lagos, p. 42.

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

Increasing access to Higher Education: A study of the diffusion of online teaching among 913 college faculty

Peter Shea
University at Albany, State University of New York

Alexandra Pickett
SUNY System Administration

Chun Sau Li
University at Albany, State University of New York

Abstract

Online learning environments provide an unprecedented opportunity to increase student access to higher education. Accomplishing this much needed goal requires the active participation and cooperation of university faculty from a broad spectrum of institutional settings. Although online learning has seen rapid growth in recent years, it remains a relatively small percentage of the entire curriculum of higher education today. As a relatively recent development, online teaching can be viewed through the lens of diffusion of innovation research. This paper reports on research from 913 professors from community colleges, four-year colleges, and university centers in an attempt to determine potential barriers to the continued growth in adoption of online teaching in higher education. It is concluded through factor and regression analysis that four variables are significantly associated with faculty satisfaction and their likelihood, therefore, to adopt or continue online teaching – these include levels of interaction in their online course, technical support, a positive learning experience in developing and teaching the course, and the discipline area in which they taught. Recommendations for institutional policy, faculty development, and further research are included.

Keywords: online teaching, faculty satisfaction, faculty development, diffusion of innovation, access, higher education, study

Introduction

Online learning in higher education is a topic that has received much attention in recent years, in large measure due to its explosive growth. According to the Sloan-Consortium report, *Sizing the Opportunity: The Quality and Extent of Online Education in the United States*, it is estimated that more than 1.9 million college students were engaged in learning at a distance via Internet-based technologies in Fall 2003 and that this number is expected to grow to 2.6 million in Fall 2004. The authors also report that more than 33 percent of such students took all of their courses online, and more than 80 percent of US colleges now offer at least one fully online or blended course

(Allen and Seaman, 2004). Others have reported similar growth rates for online education in the U.S. and Canada (Lewis, Levin, and Green, 1999; LaGrange and Foulkes, 2004; U.S. Department of Education, 2004). This growth is also reflected in the online program studied here, The State University of New York Learning Network (SLN), which in the 2003-2004 academic year offered more than 80 complete online degree programs to approximately 70,000 students enrolled across 40 campuses. These numbers compare to just eight online courses offered to 56 students in four institutions in the 1995-96 academic year.

The benefits cited by faculty of offering online learning opportunities to students have been well documented (Dziuban, Shea, and Arbaugh, 2005) and include greater and higher quality interaction with students (Kashy, Thoennessen, Albertelli, and Tsai, 2000; Hartman, Dzuiban, and Moskal 2000; NEA, 2001; Shea, Fredericksen, Pickett, Pelz, and Swan, 2001; Smith, 2001; Swan, Shea, Fredericksen, Pickett, Pelz, and Maher, 2000); increased convenience and flexibility for their teaching and students' learning (Arbaugh, 2000; Hartman and Truman-Davis 2001; NEA, 2001); better access to student populations and increased access for students to higher education (NEA, 2001); enhanced knowledge of educational technology (Fredericksen, Pickett, Pelz, and Swan, and Shea, 2000; Rockwell, Schauer, Fritz, and Marx, 1999; Thompson, 2001), increased opportunities for professional recognition and research (Hartman and Truman-Davis, 2001; Hislop and Atwood, 2000; Smith, 2001), high levels of student learning (Hartman, Dzuiban, and Moskal 2000; NEA 2000, Shea et. al., 2001, 2002; Thompson, 2001), greater necessity and opportunity for more systematic design of online instruction and a corollary positive impact on student learning and on classroom teaching (Shea, Pelz, Fredricksen, and Pickett, 2003).

While these benefits suggest that most faculty members may be quite willing to engage in online teaching, experience indicates there are still significant barriers and resistance to such technology-mediated instruction. Commonly cited barriers include more time required (Clay, 1999; Hartman and Truman-Davis, 2001; Hislop and Atwood, 2000; NEA, 2001; Thompson, 2001; Schifter, 2000); inadequate compensation (Betts, 1998; NEA, 2001; Rockwell et al., 1999; Smith, 2001; Wolcott, 1997), ownership issues (NEA, 2001; Twigg, 2000; Werry and Mowbray, 2001); more work to develop and teach online (though possibly counterproductive to professional advancement) (Betts, 1998; Schifter, 2000), technical difficulties (Chizmar and Williams, 2001; NEA, 2001, Schifter, 2000), and inadequate training, support and the addition of new roles (e.g., faculty become the helpdesk) (Fredericksen et. al, 2000; Hartman and Truman-Davis, 2001; Schifter, 2000; Thompson, 2001).

If the benefits associated with online teaching are to be realized – especially those most clearly revered, such as increasing access to higher education – faculty participation and engagement is critical. Higher education enrollments are growing and are expected to continue to grow – for example between 1997 and 2003 an additional 111,225 students participated in higher education in New York State alone (The Nelson A. Rockefeller Institute of Government, 2004). While there has been a tremendous growth in the complete online learning enterprise, it still remains a small fraction of the higher-education curriculum relative to the traditional classroom – for example the Pew Internet and American Life Project estimates that, despite rapid growth in online learning, less than one percent of Americans who log onto the internet on a typical day do so to study online for college credit (Pew Internet and American Life Project, 2004). It is estimated that less than 10 percent of the curriculum of American colleges is available online (Mayadas, 2004), a trend that is also true within the organization studied here. While growth in online education has been dramatic, it seems clear that much more can be done to accommodate the increasing demand for higher education through online teaching and learning environments.

Part of the explanation for the limited use of online teaching and learning is its incompatibility with the teaching styles of many professors. It is often claimed that faculty are more likely to adopt Web-enhanced and hybrid options, rather than complete online teaching and learning (due in part to the complexity and time investments of the latter). While this makes sense intuitively – and despite the fact that more than 80 percent of public four-year colleges provide faculty access to course management systems to offer online learning – it is estimated that faculty only use them in 20 percent of their courses (Lynch, 2002). Thus, it appears that even Web-enhanced and hybrid uses of Internet-based technologies for higher education teaching and learning remain quite limited. Understanding and responding to the concerns of professors is crucial to the further expansion of online teaching and learning opportunities. In order to respond to bold calls for increasing the number of online courses and students by ten-fold in the next ten years (Mayadas, 2004), careful attention must be paid to the participation of such faculty, without whom even existing levels of online offerings will not be sustainable.

This study reports result of research on faculty satisfaction with online teaching conducted through a large, state-wide online program – the SUNY Learning Network. The SUNY Learning Network (SLN) represents fertile ground for investigations of faculty adoption of this innovation – more than 1,000 professors across a broad range of colleges teach using the technologies and supports provided through the program each semester. With the assistance of the SLN instructional design and technology support staff these faculty have developed, and the program has delivered more than 3,000 online courses to more than 250,000 student enrollments since 1996.

The issues surrounding faculty engagement and satisfaction in online teaching and learning have been explored by a variety of researchers. Faculty adoption and use of online learning technologies may be considered an instance of the larger realm of diffusion of innovation in higher education generally. A number of theoretical models on diffusion of innovation exist (Dooley, 1999; Hall, Wallace, and Dossett, 1973; Rogers, 1963, 2003) which are relevant to discussions of faculty engagement with online teaching. The most commonly cited model is Rogers' (2003) who suggests that faculty go through several stages in the adoption process, which is influenced by specific characteristic of the innovation. The stages of adoption include knowledge of the innovation, persuasion, decision, implementation, confirmation, and in some instance, reinvention (Figure 1).

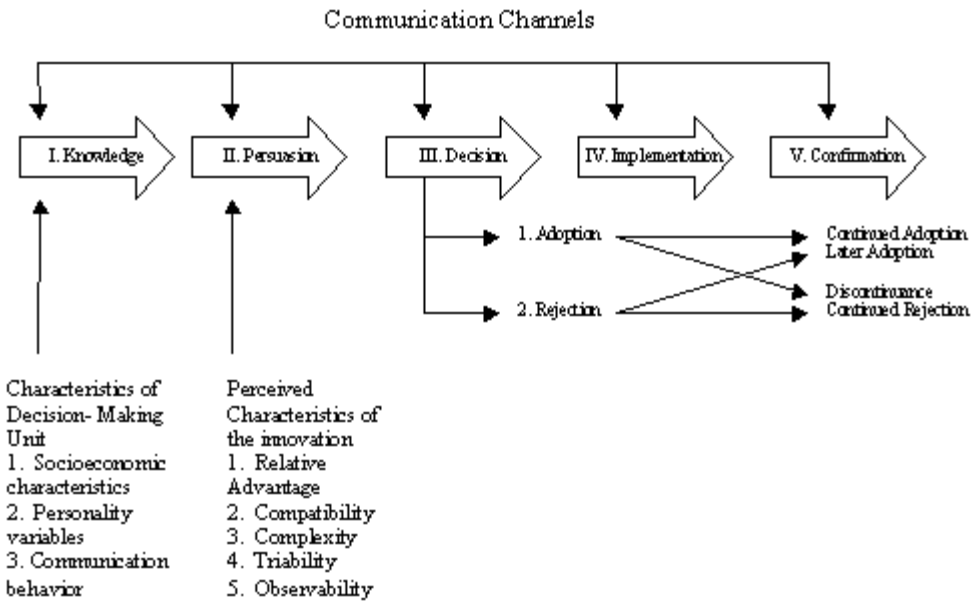


Figure 1. Rogers' (2003) Diffusion of Innovation Model

Within the knowledge stage, individual characteristics of the decision maker bear on whether the process will continue to the next stages – these include socio-economic and personality variables and communication behaviors (Rogers, 2003). Individual characteristics of the decision-maker support or undermine the decision to be persuaded in the next stage. The knowledge stage also has a bearing on administrative decisions about whom to consider for support or inclusion in online teaching initiatives. A good alignment of the appropriate individual characteristics should be assessed, because innovations tend to fail due to the audience to whom they are initially disseminated.

In the persuasion stage the individual considers the relative advantages, compatibility, "observability," "triability," and complexity of an innovation. Relative advantage refers to the degree to which the adopter perceives the innovation to represent an improvement in either efficiency or effectiveness in comparison to existing methods. The adoption of an innovation such as online teaching is, to a certain extent, contingent upon the existence and success of faculty development and training efforts. In these efforts it is essential that potential adopters are made aware of the relative advantages of the innovation under consideration. The online program studied here has made significant efforts in this regard; with more than 100 days of face-to-face training offered each year, the program has endeavored to ensure that new online professors are given relevant information on the advantages of online instruction. The relative advantages of online instruction communicated to new faculty include its flexibility, interactivity, and the programmatic and technical support offered by the SLN to students and instructors (Shea et. al., 2002).

Observability refers to the ease with which the technology can be seen, imagined, or described to the potential adopter (Rogers, 2003). Through the SLN's faculty development process, new faculty members are provided access to views and examples of the technology and pedagogy of online learning. This is accomplished through access to both online courses for observation and an online all-faculty conference that allow new faculty to see the environment in which online teaching and learning occur. Through demonstration activities, potential adopters are assisted through this stage (Shea, Fredericksen, Pickett, and Pelz, 2004).

Triability refers to the capacity to experiment with the new technology before adoption. The greater the opportunity to test the new technology, the more likely it will be adopted (Rogers, 2003). Again, through the SLN's all-faculty conference, through links to live and archived online courses for observation and through the provision of technical scaffolding, new faculty in the SLN are given ample opportunity to test online teaching before they actually engage in it. The all-faculty conference allows new instructors to engage in online teaching and learning in the same environment that their future students will use (Shea, Fredericksen, Pickett, and Pelz, 2004).

The fourth characteristic in Rogers' model is complexity – the degree to which the innovation is difficult to understand or apply (Rogers, 2003). Managing complexity is among the greatest challenges to the diffusion of innovation. The online program studied here provides both technical and human resource support to assist faculty to deal with complexity issues. The provision of wizard-driven online course templates for the SLN's course developers allows potential adopters to manage the complexity of creating a complete online course "from scratch." With the click of a button, new faculty are prompted through the creation of an outline for their online course, which includes options for a course syllabus, a schedule, and learning modules with embedded documents for modules overviews, lectures, readings, assignments, tests and self tests, discussions, and small groups. Through this kind of scaffolding, new faculty are assisted to deal with the inherent complexity of designing a complete online course (Shea, Fredericksen, Pickett, and Pelz, 2004).

Beyond the technical assistance provided by scaffolding technologies as described above, the SLN provides programmatic support through its Multimedia Instructional Design (MID) group and faculty and student helpdesk (Shea, Pickett, and Pelz, 2004). The MID program consists of a core group of instructional designers and more than 40 campus-based instructional support professionals. The SLN provides training and community development infrastructure to create and sustain a culture across the system that supports faculty efforts to use technology effectively. Through MID training activities, an annual "summit," and ongoing monthly meetings, the MID group shares and continues to grow the knowledge needed to support faculty's decision to adopt and implement online learning. The SLN provides more than 100 days of training per year in the design, development, delivery, and assessment of online teaching and learning.

The SLN's faculty and student helpdesk provide a single point of contact to address technical issues as they arise in the development and delivery of online learning. To obtain rapid assistance with technical issues, faculty may contact the SLN's helpdesk via phone, email, or via Web-based form. Providing such support reduces the threat that the complexity of the technology will impede adoption or lead to cessation of use of innovations such as online teaching. The SLN's student helpdesk removes the burden from faculty of handling student technical support issues, another threat that exists between the decision and confirmation stages in the Roger's diffusion model.

In order to assess the functioning of the program, each semester the program implements an online survey of both faculty and students. The faculty survey attempts to collect various measure of satisfaction and solicits faculty reactions to different components of the online teaching experience. A copy of the questionnaire is included in appendix A. This survey provides opportunity to assess certain elements of Rogers' diffusion of innovation theory – particularly the decision and confirmation stages of the model, and to determine whether and how the model applies to the issue of faculty adoption of online teaching within the broad context represented by the SLN. The measures of satisfaction that the survey items solicit are measures of confirmation in the model. Lack of satisfaction or confirmation assessed through the survey may point to factors in the decision stage that explain likelihood of continuation or discontinuation. Responses to items may provide alternative rationale that support, or are not accounted for, by the model. Additionally, given the relatively large sample size and number and diversity of institutions

represented, other organizations involved in the development of online learning initiatives may be interested in these results for lessons learned and potential obstacles to avoid in diffusing technological innovations to higher education faculty.

Method

Participants

Participants in this study included 913 faculty members who taught at 33 colleges in the SLN in the 2003-2004 academic terms. Approximately 43 percent of the respondents were male and 57 percent were female. The age range included faculty who were under age 25 (less than .2 percent) to over age 66 (more than 5 percent). The largest group was age 46-55 (nearly 40 percent) followed by 56-65 (30 percent). Additional demographic characteristics of faculty respondents are summarized in Table 1.

Table 1. Demographic Characteristics of Faculty Respondents (see table next page)

	Number (N)	Percentage (%)
Total Sample Size	913	
Time		
Fall 03	545	59.69
Spring 04	368	40.31
Gender		
Male	388	42.50
Female	525	57.50
Age		
Under 25	2	.20
25-35	81	8.90
36-45	147	16.10
46-55	360	39.40
56-65	276	30.20
66+	47	5.10
Content Area		
Math/Science	219	24.00
Humanities	150	16.40
Business/Prof. Dev.	181	19.80
Art	6	.70
Social Science	190	20.80
Other	167	18.30
Institution type		
University Center	47	5.10
University College	222	24.30
College of Technology	22	2.40
Specialized College	54	5.90
Statutory College	8	.90
Community College	520	57.00
Other	40	4.40

This sample represents approximately 34 percent return rate for these semesters. This rate of response, while low, is in alignment with rates reported by others using online survey methods (Sheehan, 2001). It is hypothesized that many Internet users are "survey saturated," and inasmuch as assessments are implemented each semester in this program, faculty in the online environment studied here may also suffer from such overload – leading to lower response rates. Given the nature of the sample, which was limited and self selected, caution needs to be taken in applying these results – though this is a relatively large and diverse sample, there may still be issues of generalizability to the larger population. The levels of satisfaction presented here may be a function of the sample, again, though large and diverse, members of the sample may be more interested or simply more persistent and diligent and thus could be more satisfied than non-respondents. It must be admitted that inter-institutional research on recent technological innovations, such as presented here, does present certain challenges; for example, comparable demographic information for individual online faculty across these institutions is not collected or maintained in any single database, making estimates of generalizability to broader population parameters difficult to derive.

Instrument

Participants in the study responded to a 35 item survey assessing their levels of satisfaction, interaction, technical preparedness, technical difficulties, time investment, appropriateness of the online environment (for their discipline), student learning, and the influence of the online course development and delivery experience on their understanding of new methods of pedagogy, assessment, and its likely impact on their classroom teaching. Most items included were composed using a five-point Likert-type scale in which participants responded to statements about their online teaching experience. A copy of the instrument is included in Appendix A.

Procedure

Faculty were contacted via email three times during an eight-week period asking for their participation in both the fall 2003 and spring 2004 academic semesters. Respondents were also solicited through posted announcements on the SLN's website. To encourage faculty participation, local campus support groups were also contacted by the researchers. The survey was available in an online format, and faculty were prompted to complete the survey when they logged into the online teaching and learning system. Instructors completed the survey using a Web-based form. The survey was also accessible from a link sent to the faculty in their email.

Faculty from 36 of the 40 campuses offering courses (90 percent) were represented. These campuses were fairly representative of the overall categories of colleges eligible to participate. Those campuses that are not represented included two community colleges, one four-year college, and one university center – i.e., campuses that were not represented did not cluster around a single institution type.

Results

Descriptive results

Generally speaking, results for the survey disclose that respondents were highly satisfied with the experience of developing and teaching online courses. Approximately 90 percent reported that they were satisfied with the course they had just completed, with online teaching in general, and that their students learned a great deal in their online course (see Table 2). A large majority of the

faculty reported they felt the online environment was appropriate for teaching in their content area (93.0 percent), and that they would like to teach an online course again (97.6 percent), or would recommend online teaching to a colleague (91.9 percent) (see Table 3). When asked to compare the performance of students in the online course they just finished teaching with the performance of students in similar courses they had taught in the classroom, the majority felt there was no difference, although approximately 33 percent of respondents thought that their online students performed better than classroom-based students, and only about 9 percent felt that their classroom students performed better (see Table 4).

Table 2. General faculty satisfaction with online teaching (N=913)

	Very satisfied with teaching this current course	Very satisfied with online teaching in general	Students learned a great deal
Strongly Agree	50.2%	71.1%	47.3%
Agree	40.0%	24.5%	50.4%
Neutral	7.1%	2.8%	/
Disagree	2.5%	1.3%	1.8%
Strongly Disagree	0.2%	0.2%	0.5%

Table 3. Additional indicators of faculty satisfaction with online teaching (N=913)

	Online was an appropriate environment for teaching	Would teach online again	Would recommend online teaching to colleagues
Yes	93.0%	97.6%	91.9%
Undecided	6.1%	1.6%	6.5%
No	0.9%	0.8%	1.6%

Table 4. Faculty perception of online and classroom students' performance (N=913)

1 Classroom Students Performed Better	8.8%
2 No Difference	37.6%
3 Online Students Performed Better	32.6%
4 I did not teach this course in the classroom	21.0%

Factor analysis

To determine which sets of variables in the overall results might form coherent subsets, a factor analysis was performed on the data. Variables that correlate with each other, but are, for the most part, independent of other subsets are grouped into factors. Such factors are thought to reflect underlying processes that are represented by the correlations between the variables (Tabachnick and Fidell, 2001). Analysis of the results via factor analysis may provide guidance in determining the validity of the Rogers model in a number of ways, for example do the results cohere in ways that reflect stages in the model and the overall results?

In the factor analysis questions 5 to 33 were input to examine their correlations. It was found that questions 5, 7, 8, 16, 26, and 28 had small correlation coefficients (less than .30) so that they were not included in the analysis following conventions established for this statistical approach (Tabachnick and Fidell, 2001). The correlation matrix of the remaining 21 items from the faculty online teaching and learning survey is presented in Table 5. A principal component extraction method with oblique rotation was performed to determine the dimensionality of the 21 items. Delta was equal to zero and Bartlett's test of sphericity was acceptable for factor analysis ($c2 = 4523.80$, $p<.001$). Five factors were extracted and 57.2 percent of total variance could be accounted for. Variables are ordered and grouped by size of their loading to facilitate interpretation. The pattern matrix is presented in Table 6; the five factors were labeled as: Interaction, Time, Faculty Learning, Technical Support, and Satisfaction Measures.

Reliability analysis was performed to examine the internal consistency of the factors. Results showed that Interaction, Faculty Learning, and Satisfaction Measures have satisfactory internal consistencies, the Cronbach's alphas were .81, .78, and .75, respectively. The internal consistencies of Time and Technical support were moderate, with coefficients of .57 and .60.

Table 5. Item Correlation Matrix

	6	9	10	11	12	13	14	15	17	18	19	20	23	24	25	27	29	30	31	32
9	.53																			
10	.33	.37																		
11	-.04	.03	.10																	
12	-.05	.05	.09	.53																
13	.36	.35	.42	.11	.23															
14	.23	.21	.36	.08	.15	.53														
15	.04	.07	.02	.35	.24	.08	.02													
17	.35	.30	.30	.02	-.02	.24	.22	.05												
18	.26	.17	.12	-.05	-.04	.08	.04	-.06	.27											
19	.34	.20	.24	-.16	-.11	.20	.09	-.09	.30	.38										
20	.61	.43	.37	-.09	-.07	.37	.23	.00	.41	.39	.57									
23	.38	.27	.13	-.05	-.05	.19	.14	-.02	.12	.15	.22	.37								
24	-.26	-.15	-.10	.11	.19	-.07	-.05	.09	-.07	-.05	-.07	-.19	-.36							
25	.33	.30	.39	.06	.08	.61	.48	.03	.24	.15	.21	.39	.19	-.10						
27	.24	.24	.13	.14	.08	.20	.14	.19	.14	.09	.17	.23	.22	-.10	.25					
29	.27	.29	.19	.05	-.02	.30	.15	.17	.24	.16	.23	.32	.21	-.09	.30	.61				
30	.24	.21	.15	.06	.06	.20	.16	.11	.14	.17	.21	.29	.14	-.09	.18	.34	.42			
31	-.41	-.32	-.28	.08	-.02	-.43	-.30	-.10	-.28	-.20	-.23	-.45	-.19	.11	-.51	-.20	-.27	-.14		
32	.25	.21	.16	.04	.04	.20	.21	.11	.10	.08	.21	.28	.19	-.07	.24	.39	.47	.60	-.24	
33	.23	.12	.03	-.12	-.13	.07	.08	.08	.03	.06	.06	.18	.38	-.32	.15	.22	.16	.08	-.22	.15

Table 6. Pattern Matrix

	Interaction	Time	Faculty Learning	Technical Support	Satisfaction Measures
q14 Interaction between Students	.82				
q13 Interaction with Students	.81				
q25 Knowing Students	.78				
q10 Student Performance Compared	.56				
q31 Feelings of Isolation	-.52				
q11 Preparation Time		.83			
q12 Teaching Time		.72			
q15 Course Development Time		.66			
q32 Opportunities for Alternative Instruction			.82		
q30 Opportunities for Alternative Assessment			.78		
q29 Effects on Classroom Instruction			.74		
q27 Opportunities to Reflect on Classroom Teaching			.68		
q33 Usability of the online program LMS				-.75	
q24 Effects of Technical Difficulties				.72	
q23 Satisfaction with online program				-.69	
q18 Teach Online Again					.74
q19 Recommend a Colleague					.69
q20 Online Teaching Satisfaction					.66
q17 Online Appropriate for content					.60
q6 Satisfaction Level with Course					.49
q9 Student Performance					.37

Descriptive analysis

The factor values were obtained by calculating the mean of the items within the factor. Table 7 presents mean score, standard deviation and Pearson correlation coefficients of the factors:

Interaction, Time, Faculty Learning, Technical Support, and Satisfaction Measures. It was found that faculty satisfaction was significantly and positively associated with interaction (=.45, p<.001), faculty learning (=.38, p<.001), and technical support (=.33, p<.001).

Table 7. Mean, Standard Deviation, Correlations

	M	SD	Satisfaction		Interaction		Time		Faculty Learning	
Satisfaction	3.54	.33	1.00							
Interaction	3.29	.80	.45	***	1.00					
Time	3.70	1.17	-.05		-.04		1.00			
Faculty learning	4.04	.60	.38	***	.30	***	.16		1.00	
Technical support	4.08	.72	.33	***	.22	**	-.11	***	.21	

*** p<.001 ** p<.01

Based on previous investigations the model which emerges from the factor analysis appears to reveal underlying variables important to faculty satisfaction and the likelihood to adopt or continue to engage in online teaching. As noted in the review of literature above, each of these clusters of variable reflect important considerations identified by previous investigators analyzing faculty engagement with online teaching. Some researchers (e.g., Nachmias, 2002) have tied these variables to a diffusion model such as Roger's, and they do appear to fit well into one or more of the stages he outlines – each factor represents a well defined and recognized support or impingement on satisfaction with the experience of developing and teaching in an online environment and subsequent decisions to reject, adopt, or persist with it. One test of these categories is the degree to which the satisfaction variables are associated with the others – time, technical support, faculty learning, and interaction variables – identified in the factor analysis.

To confirm the relative usefulness of these factors in understanding faculty engagement and persistence with online teaching, a regression analysis was conducted. The results are presented below.

Multiple regression analysis

A sequential multiple regression was applied to examine the relationship between online teaching satisfaction and other variables. The dependent variable was online teaching satisfaction as identified by the cluster of variables in the factor analysis, the independent variables were Time, Technical Support, Faculty Learning, Interaction, demographic (such as gender, age) and program information (such as content, institution type, and etc.), and reason of online teaching.

Results of the assumption check led to transformation of the variables to reduce skewness and number of outliers, and to improve the normality, linearity, and homoscedasticity of the residuals. Logarithmic transformations were used on the Time, Faculty Learning, Technical Support, and Satisfaction Measures. The Interaction factor was not transformed because the scores of skewness and kurtosis were small, approximately equal to zero. Additionally, with the use of a p<.001 criterion for Mahalanobis distance, 15 cases were identified as outliers and regarded as missing data.

The intercept, the un-standardized ( ) and standardized regression coefficients ( ), R2 statistics, adjusted R2, and change in R are presented in Table 8. R was significantly different from zero at the end of each step, after Step 5, with all IVs in the equation, R=.59, F(33, 864)=14.30, p<.001. After Step 1, the regression of the Interaction factor on Online Teaching Satisfaction factor resulted in adjusted R2 = .22, Finc(1, 896) =258.62, p<.001. After Step 2, with the Technical Support factor added to the prediction of Online Teaching Satisfaction, R2 = .29, Finc(1, 895) =76.17, p<.001. The R2 change was again significant. The factors for Faculty learning and Time were added into the equation in Steps 3 and 4 with adjusted R2 = .31, Finc (1, 894) =33.43, p<.001, and adjusted R2 = .31, Finc (1, 893) =.49, p>.05, respectively. The R2 change was found to be significant in Step 3, but not significant in Step 4. After Step 5, the variables of instructor gender, age, content area taught, institution type (community college through university center), numbers of course enrollments, years of online teaching experience, primary reason for online teaching, and the extent to which the course was fully developed before it began were added into the equation, the adjusted R2 = .33, Finc (1, 864) =1.95, p<.01. The regression analysis showed that Interaction, Technical Support, Faculty Learning significantly contribute to predict the satisfaction of faculty teaching, whereas the time variables did not. The content area variable was significant and implies that instructors of math/science, humanities, business/professional development tend to report higher levels of satisfaction than instructors in other discipline areas. The other demographic and contextual variables were not significant.

Table 8. Sequential Regression on Faculty Online Teaching Satisfaction

		Intercept	Interaction	Technical Support	Faculty Learning	Time	Demographic /program	R^2	Adj. R^2	R^2 Change
Model										
#1	Beta	.27***	.06***	/	/	/	/	.22	.22	.22***
	SE	.01	.00	/	/	/	/			
	St. Beta		.49	/	/	/	/			
#2	Beta	.22***	.05***	.14***	/	/	/	.29	.28	.06***
	SE	.01	.00	.02	/	/	/			
	St. Beta		.41	.25	/	/	/			
#3	Beta	.17***	.04***	.12***	.11***	/	/	.31	.31	.03***
	SE	.02	.00	.02	.02	/	/			
	St. Beta		.37	.23	.17	/	/			
#4	Beta	.17***	.04***	.13***	.12***	-.01	/	.31	.31	.00
	SE	.02	.00	.02	.02	.02	/			
	St. Beta		.37	.22	.18	-.02	/			
#5	Beta	.23***	.04***	.12***	.11***	-.03***	√	.35	.33	.04***
	SE	.03	.00	.02	.02	.02	√			
	St. Beta		.38	.22	.17	-.06	√			

Content Area: math/science (Beta =.03*, SE=.01, St. Beta = .12), humanities (Beta=.02*, SE=.01, St. Beta=.08), and business/professional development (Beta=.02*, SE=.01,St. Beta=.08)

Note: *p<.05, **p<.01, ***p<.001

Finally, we performed a regression analysis on those significant factors and results showed that R was .57 and adjusted R2 was .32, which indicated 32 percent of total variance in faculty online teaching satisfaction could be accounted for by measure of interaction, technical support, faculty learning, and discipline area of instruction - math/science, humanities and business/professional tend to express higher levels of satisfaction. Presented in Table 9 are the un-standardized, standard error, and standardized regression coefficients. Examination of the tests revealed that online teaching satisfaction was linearly related to interaction (t=12.76, p<.001), technical support (t=7.94, p<.001), faculty learning (t=5.52, p<.001), and discipline area of instruction - Math/Science (t=4.05, p<.001), Humanities (t=3.04, p<.01), and Business/Professional (t=2.17, p<.05).

Table 9. Contributions of Predictors to Faculty Online Teaching Satisfaction

Variable	Beta	Standard Error	Standardized Beta	t	
Intercept	.19	.02		12.22	***
Interaction	.04	.01	.38	12.76	***
Technical Support	.13	.02	.23	7.94	***
Faculty Learning	.11	.02	.16	5.52	***
Math/Science	.03	.01	.12	4.05	***
Humanities	.02	.01	.09	3.04	**
Business/Professional	.02	.01	.07	2.17	*

* p<.05, ** p<.01, *** p<.001

Discussion

The results presented here suggest that interaction, technical support, opportunities for learning, and discipline-specific factors are significantly linked with faculty satisfaction in online teaching, including measures that indicate adoption and continued engagement with this innovation – two elements of the Rogers diffusion of innovation model. We use the terminology "suggests" intentionally – it appears from these results that faculty satisfaction in online teaching may also depend on factors not identified here, as a significant proportion of the variance in the factor reflecting satisfaction remains unexplained by this study. The results reported here, however, are consistent with concerns frequently cited in the literature on faculty engagement in technology-mediated instruction. Each of the variables is discussed below.

Interaction

Perhaps the most frequently cited variable in discussions of quality in online learning environments is interaction. As indicated above, high levels of interaction are frequently mentioned as one of the potentially positive aspects of online teaching and learning. Enhanced opportunities for interaction online, when properly managed so as not to be overwhelming, may be reasonably associated with the relative advantage in the Roger's diffusion of innovation model. The results presented here support the centrality of well-managed interaction and suggest

that levels of interaction influence faculty decisions to adopt, reject, or continue with online teaching. The factor reflecting interaction in this study included faculty perceptions of levels of interaction with their students, between their students, their level of knowledge of students, and faculty feelings of isolation in the online environment. The multivariate regression analysis indicates that higher reported levels of interaction with and between students, greater knowledge of students, and lower feelings of isolation are positively associated with the variables in the satisfaction factor – including reported likelihood to teach again online, likelihood to recommend a colleague to teach online, satisfaction with online teaching in general, and satisfaction with the specific online course just completed. Each of these measures reflects components of the diffusion model proposed by Rogers (2004). For example, interaction in online environments can represent a measure of complexity in the model – which may impinge upon adoption and continued used. Faculty members new to online teaching, often report being overwhelmed by increased interaction levels. The supports offered to instructors in this program (Shea, Fredericksen, Pickett, and Pelz, 2004) are designed, in part, to allow them to cope with higher levels of interaction and thus overcome this complexity issue reflected in the Roger's model. The results reported here suggest that faculty who were likely to continue to engage in this innovation as measured by the satisfaction factor, were able to view interaction in a positive light rather than as overwhelming.

Technical support

As with the interaction variables, the same may be said about the significance of faculty satisfaction with technical supports and technical barriers – the addition of this variable to the regression resulted in a significant change in the adjusted R2 value. Positive perceptions regarding the usability of the SLN's Learning Management System, low levels of reported technical difficulties, and higher levels of satisfaction with faculty support services, contribute significantly to the regression equation for the cluster of satisfaction variables previously identified. The existence of technical support may also reasonably be associated with overcoming complexity issues identified in the Roger's model. It appears that faculty who reported satisfaction with these elements of the technical and programmatic support system, were more satisfied as measured by the factor containing items that reflect satisfaction with online teaching and the course they just taught, likelihood to teach online again, likelihood to recommend a colleague, etc.

Faculty learning

The variables included in this factor focused around the opportunities for gaining new knowledge, skills, and insights about the act of teaching as a result of the experience of developing and instructing an online course. Faculty who were more likely to report that this experience afforded them opportunities to consider – alternative means of instruction, alternative means of assessment, how they taught in the classroom, and that developing and teaching and online course would likely improve how they taught in the classroom – accounted for more of the variance in responses to the cluster of satisfaction variables. Faculty who felt that developing and teaching online was a learning experience for themselves, tended to report more positive outcomes – higher levels of satisfaction, greater likelihood to teach again, greater likelihood to recommend a colleague, etc., important considerations for the diffusion of this innovation. Support provided to faculty in the training cycle affords opportunities for reflecting on developing and teaching online courses as a learning experience (Shea, Fredericksen, Pickett, and Pelz, 2004); such an orientation may be viewed as an additional "relative advantage" in Roger's model for these instructors when considering whether to adopt or continue to use this innovation. It appears that this advantage is

associated with satisfaction with this innovation and increased probability of adoption or continuation.

Time

Concerns about the additional time and effort associated with online teaching are quite common in the literature surrounding e-learning (Schifter, 2000; Betts, 1998; Clark 1993; Taylor, 1991). The variables included in the factor associated with time in this study did not contribute significantly to the regression equation. One interesting correlation may help explain this result. While concerns about additional time requirements for online teaching would suggest that faculty who reported high levels of time commitment to develop and deliver online courses would be more likely to express dissatisfaction, the opposite appears to be true. Faculty who reported more time in developing their online course reported more satisfaction with the course they had just finished teaching. Other correlations concerning time appear to be inconclusive or non-significant – for example, combining the means of all the satisfaction measures and comparing satisfaction levels by reported teaching time and reported course development time reveals no significant differences (i.e., faculty who reported that the spent only 30 hours developing their course were no more or less satisfied than those who reported spending in excess of 150 hours). While few researchers have engaged in comparisons measuring actual time investment in online and traditional teaching, the results of this line of inquiry suggest that they may actually be equivalent (e.g., Lazarus, 2003), thus leading to the conclusion that, in the end, these time considerations do not significantly influence levels of satisfaction with online teaching. Finally, it is not unlikely that this factor needs to be refined to increase reliability; additional items related to time should be generated and included in an expanded and more reliable factor.

Discipline specific variables

The evidence suggests a small but significant effect for the discipline of instruction on the factors reflecting faculty satisfaction. It appears that faculty identifying themselves as teaching courses in faculty in Math/ Science, Humanities and Business/ Professional Development have higher levels of satisfaction than those identifying themselves as teaching in the Social Sciences, Art, or “Other” categories. Given the relatively small contribution of this factor and the skewness of the members within each of the categories (e.g., only nine faculty reported teaching within the “Art” discipline area), this finding requires additional investigation and confirmation.

Recommendations

These results suggest that a number of variables significantly correlate with faculty satisfaction in online teaching. In order to meet the challenge of increasing access to higher education through the diffusion of online teaching and learning, institutions need to be mindful of the potential to impact faculty in at least three large, inter-related areas: Faculty Development, Technical Support, and Course Design. These are discussed further below.

Faculty development

It is now commonly accepted that high quality online teaching and learning must be supported through systematic and well organized faculty development initiatives. In previous research we have outlined the nature of the faculty development process in the SLN program studied here (Shea et al. 2001, 2002, 2004) and presented results indicating that faculty development efforts influence not only faculty satisfaction, but impact on the reported learning and satisfaction of the

students of faculty who receive such training (Shea, Pickett, and Pelz, 2004). The current study also implies that faculty development efforts that encourage instructors to participate in ways that highlight the opportunity to explore, learn, create, and apply their learning to their traditional teaching methods, may lead to higher levels of adoption and continued use. Engaging experienced online faculty in training and development efforts who can attest to this impact, are likely to strike a resonant chord with other potential adopters of this innovation. Veteran faculty members played a large role in training efforts in this program – experienced online instructors are invited to new faculty training sessions and their experiences, both positive and negative, allow the uninitiated to better understand the nature of this innovation, thus increasing opportunities deemed facilitative in Roger's diffusion model (more on this below). Planning for substantial online teaching and learning programs should include adequate resources allocated to faculty development and support (including policies recognizing online teaching in tenure and promotion considerations). The program studied here allocates an estimated 5-6 month development period for the design, development, and implementation of each cohort of faculty-created online courses. Instructional designers and trainers spend 100 days per year in face-to-face training and many additional hours involved in follow-up, online support. While resource intensive, such efforts play a crucial role in assisting faculty through the persuasion and decision stages of the technology adoption model posed by Rogers. For example, learning from peers who have already adopted the innovation has an impact on at least three of the five elements of the persuasion stage in Roger's model, including relative advantage, compatibility, and complexity. Understanding relative advantage is made easier when a successful adopter explains it to a new online instructor – real and credible examples can be offered, as is the case in trainings offered in this program. Learning from veteran online faculty peers also demonstrates that online teaching is, at least potentially, compatible with academic culture and values – if it were not peers would not make a positive adoption decision. Opportunity to interact and learn with experienced online instructors also provides new faculty with strategies that have been successfully employed to overcome complexity issues – which are highlighted in the trainings offered in this program (Shea, Fredericksen, Pickett, and Pelz, 2004).

Technical support

Technical support is also recognized as a crucial element in the success of significant online teaching and learning endeavors. The current study supports this largely anecdotal conclusion with result from nearly 1,000 online instructors. Organizations that wish to scale-up to meet the growing demand for quality and access to online higher education have recognized the need for technical support for students – these findings suggest the same level of attention may be needed to encourage ongoing faculty adoption and continued engagement with online teaching. The continued diffusion of this innovation may rest upon the ability to persuade faculty that adequate technical support will be available as they decide whether to participate. Planning for significant online teaching and learning programs should include adequate resources allocated to technical support. The program studied here includes a professionally staffed helpdesk that is shared by the 40 colleges participating in the program. Such resource allocation avoids un-needed redundancy and avoids costs, while building a shared knowledge base that benefits all. In the program studied here, technology supports are designed in ways that assist faculty with other two elements of the persuasion stage of Roger's model not mentioned above: "triability" and "observability." For example, through the "All Faculty Conference" the program offers new faculty an opportunity to experience online learning as their students will, in the same online environment in which they will teach. Opportunities to engage in the technology environment (and to simultaneously gain exposure to online pedagogy) increase the "triability" and "observability" of the online teaching innovation, reduces the mystery, and based on these results, may reasonably be expected to increase the likelihood of adoption and continuation. Institutions wishing to increase access to

their academic offerings through online teaching and learning may benefit from offering similar opportunities to address these elements of the diffusion of innovation challenge.

Interaction

Again, while it is commonly understood that high levels of interaction in online higher education is associated with student reports of satisfaction and learning, these results suggest the same is true for faculty. Given the results relative to the issue of interaction several recommendations seem reasonable. Large scale implementations of online teaching and learning often require the use of scaffolding mechanisms to assist faculty with issues of complexity identified in the Roger's model – in the case of the SLN studied here, these include the use of course templates that encourage sound instructional design and organization, the facilitation of productive discourse, and effective direct instruction (Shea, Fredericksen, Pickett, and Pelz, 2004). Common, yet flexible course designs that enable instructors to encourage high levels of interaction with and between students coupled with faculty development efforts that support their implementation are likely to increase interaction and faculty satisfaction as well. Ongoing support from and access to academic technology specialists and or instructional designers has allowed the program studied here to grow and succeed. The expense for these human resource supports may be shared between institutions to avoid costs, but the provision for such supports seems integral to the successful adoption of this innovation.

It has been argued here that online teaching and learning represent an enormous opportunity to increase access to higher education – a much needed and unqualified benefit in our growing knowledge-based society. While online learning remains a relatively small segment of the entire higher education curriculum, better understanding of *how* this innovation may be successfully diffused to a wider audience of faculty, will enable institutions to grow to meet a larger portion of the demand for higher education in the years ahead. It is clear that limitations in this study call for additional research to understand faculty adoption and continued use of this innovation; there is much we do not know about why faculty accept or reject online teaching. It also appears clear that attention paid to the concerns of professors will facilitate their acceptance of online teaching, and evidence presented here provides some guidance in this regard. Appropriate emphasis on interactive pedagogy, faculty training, technical support, and recognition of the time-investment needed to develop and deliver online instruction will advantage institutions that are wishing to increase access to their instructional programs, and will help ensure they are delivered in a high quality online format.

Acknowledgement

The authors wish to thanks the Office of SUNY Learning Environments for its direct support of this research. The authors also wish to express their gratitude to the Director of the SUNY Learning Network and the SLN Team – especially Doug Cohen for his outstanding technical support of this research. SUNY Learning Environments is an office of the Provost and Vice Chancellor of the State University of New York.

References

Allen, E. I., and Seaman, J. (2004). *Entering the Mainstream: The quality and extent of online education in the United State, 2003 and 2004*. Needham, MA.: Sloan Center for Online Learning in Education (SCOLE).

Arbaugh, J. B. (2000). Virtual classroom characteristics and student satisfaction in internet-based MBA courses. *Journal of Management Education 24*, 32 – 54.

Betts, K. S. Factors influencing faculty participation in distance education in postsecondary education in the United States: An institutional study. (Doctoral dissertation. The George Washington University, 1998). *Dissertation Abstracts International*: UMI.

Chizmar, J. F., and Williams, D. B. (2001). "What Do Faculty Want?" *EDUCAUSE Quarterly 24*(1), 18 – 24.

Clark, T. (1993). Attitudes of Higher Education Faculty toward Distance Education: A National Survey. *The American Journal of Distance Education 7*(2), 19-33.

Clay, M. (1999). Faculty attitudes toward distance education at the State University of West Georgia. *University of West Georgia Distance Learning Report*. Retrieved January 28, 2005 from: http://www.westga.edu/~distance/attitudes.html

Dooley, K. E. (1999). Towards a Holistic Model for the Diffusion of Educational Technologies: An integrative review of the educational innovation studies. *Educational Technology and Society 2*(4), 35 – 45.

Dziuban, C., Shea, P., and Arbaugh, J. (2005). Faculty roles and satisfaction in ALNs. In S. R. Hiltz and R. Goldman (Eds.) *Learning together online: Research on asynchronous learning networks*. (pp. 169-190). Mahway, NJ: Lawrence Elrbaum Associates.

Fredericksen, E., Pickett, A., Pelz, W., Swan, K., and Shea, P. (2000). Factors influencing faculty satisfaction with asynchronous teaching and learning in the SUNY Learning Nework, *Journal of Asynchronous Learning Networks 4*(3), 245 – 278.

Hall, G. E., Wallace, R. C., and Dossett, W. A. (1973). *A developmental conceptualization of the adoption process within educational institutions.* Austin Research and Development Center for Teacher Education: University of Texas at Austin.

Hartman, J., Dzuiban, C., and Moskal, P. (2000). Faculty Satisfaction in ALNs: A dependent or independent variable. *Journal of Asynchronous Learning Networks 4*(3). Retrieved December 21, 2004 from: http://www.aln.org/alnweb/journal/jaln-vol4issue3.htm

Hartman, J. L., and Truman-Davis, B. (2001). Factors relating to the satisfaction of faculty teaching online courses at the University of Central Florida. In J. Bourne and J. C. Moore (Eds.) *Online Education Volume 2: Learning Effectiveness, Faculty Satisfaction, and Cost Effectiveness*. Needham, MA.: SCOLE.

Hislop, G., and Atwood, M. (2000). ALN teaching as routine faculty workload. *Journal of Asynchronous Learning Networks 4*(3). Retrieved December 21, 2004 from: http://www.aln.org/alnweb/journal/jaln-vol4issue3.htm

Kashy, E., Thoennessen, M., Albertelli, G., and Tsai, Y. (2000). Implementing a large on-campus ALN: Faculty perspective. *Journal of Asynchronous Learning Networks 4*(3), 231 – 244.

LaGrange, A., and Foulkes, E. (2004). Emergent framework for ICT integration within faculties of education in Canada. Ottawa: *Report prepared for Industry Canada on behalf of Canadian Association of Deans of Education*.

Lazarus, B. (2003). Teaching courses online: How much time does it take? *Journal of Asynchronous Learning Networks 7*(3), 47 – 54.

Lewis, L., Levin, D., and Green, B. (1999). *Distance education at postsecondary institutions: 1997-98.* National Center for Education Statistics, U.S. Department of Education.

Lynch, D. (2002, January 18). Professors should embrace technology in courses. *Chronicle of Higher Education Review* Retrieved June 17, 2005 from: http://chronicle.com

Mayadas, F. (2004). *Opening remarks*. Presentation at the Annual Meeting of the Sloan Asynchronous Learning Networks Conference in May 2004 at Orlando FL.

Nachmias, R. (2002). Research framework for the study of a campus-wide web-based academic instruction project. *Internet and Higher Education 5* (3), 213 – 229.

Nachmias, R. (2002). A research framework for the study of a campus-wide Web-based academic instruction project. *Internet and Higher Education 5*(3), 213 – 229.

National Education Association (2000). *A survey of traditional and distance learning higher education members*. Washington DC.

National Education Association (2001). Focus on distance education. *Update 7*(2). Washington, DC.

Pew Internet and American Life Project (2004). *Daily Internet Activities*. Retrieved January 26, 2005 from: http://www.pewinternet.org/trends/Daily_Activities_4.23.04.htm

Rockwell, K., Schauer, J., Fritz, S. M., and Marx, D. B. (1999). Incentives and obstacles influencing higher education faculty and administrators to teach. *Online Journal of Distance Learning Administration 2*(4). Retrieved December 21, 2004 from: http://www.westga.edu/~distance/rockwell24.html

Rogers, E. M. (1963). *Diffusions of Innovations.* New York: Free Press. First Edition

Rogers, E. M. (2003). *Diffusions of Innovations.* New York: Free Press. Fifth Edition

Schifter, C. C. (2000). Faculty Participation in Asynchronous Learning Networks: A Case Study of Motivating and Inhibiting Factors, *Journal of Asynchronous Learning 4*(1), 15 – 22.

Shea, P., Fredericksen, E., Pickett, A., Pelz, W., and Swan, K. (2001). Measures of Learning Effectiveness in the SUNY Learning Network. In J. Bourne and J. C. Moore (Eds.), *Online Education (Volume 2) Learning effectiveness, faculty satisfaction, and cost effectiveness* (p. 7-31). Needham, MA.: SCOLE

Shea, P., Pelz, W., Fredericksen, E., and Pickett, A. (2002). Online teaching as a catalyst for classroom-based instructional transformation. In J. Bourne and J.C. Moore (Eds.) *Elements of quality online education* (p. 103-126). Needham, MA.: SCOLE

Shea, P., Pickett, A., and Pelz, W. (2003). A follow-up study of teaching presence in the online program. *Journal of Asynchronous Learning Networks 7*(2), 61 – 80.

Shea, P., Pickett, A., and Pelz, W. (2004). Enhancing student satisfaction through faculty development: The importance of teaching presence. In J. Bourne and J.C. Moore (Eds), *Elements of quality online education: Into the mainstream - Volume 5 in the Sloan-C Series* (p. 39-59). Needham, MA.: Sloan Center for Online Education.

Shea, P., Fredericksen, E., Pickett, A., and Pelz, W. (2004). Faculty development, student satisfaction, and reported learning in the SUNY Learning Network. In T. Duffy and J. Kirkley (Eds.) *Learner-centered theory and practice in distance education* (p. 343-377). Mahway, NJ.: Lawrence Elrbaum Associates.

Sheehan, K. (2001). Email survey response rates: A review. *Journal of Computer Mediated Communication 6*(2). Retrieved May 12, 2005 from: http://jcmc.indiana.edu/vol6/issue2/sheehan.html

Smith, L. (2001). Faculty satisfaction in LEEP. A web-based graduate degree program in library and information science. In Bourne and Moore (Eds.) *Online Education (Volume 2) Learning effectiveness, faculty satisfaction, and cost effectiveness* (p. 87-108). Needham, MA.: Sloan Center for Online Education.

Swan, K., Shea, P., Fredericksen, E., Pickett, A., Pelz, W., and Maher, G. (2000). Building Knowledge Building Communities: Consistency, contact and communication in the virtual classroom. *Journal of Educational Computing Research 23*(4), 359 – 383.

Tabachnick, B. G., and Fidell, L. S. (1996). *Using multivariate statistics*. (3rd. Ed.), New York: Harper Collins College Publishers.

Taylor, J. C., and White, V. J. (1991). Faculty attitudes towards teaching in the distance education mode: An exploratory investigation. *Research in Distance Education 3*(3), 7 – 11

The Nelson A. Rockefeller Institute of Government, State University of New York (2004). *New York State Statistical Yearbook online.* Retrieved December 21, 2004 from: http://www.nysstatistics.org/yearbook/04/data/J_1.pdf

Thompson, M. (2001). Faculty Satisfaction in Penn States World Campus. In J. Bourne and J. C. Moore (Eds.) *Online Education (Volume 2) Learning effectiveness, faculty satisfaction, and cost effectiveness*, (p. 129-144). Needham, MA.: Sloan Center for Online Education.

Twigg, C. (2001). *Who Owns Online Courses and Course Materials? Intellectual Property Policies for a New Learning Environment.* Retrieved December 21, 2004 from: http://www.center.rpi.edu/PewSym/mono2.html

U. S. Department of Education, National Center for Education Statistics (2004). *The Condition of Education 2004* (NCES 2004-077). Washington, DC.: US Government Printing Office.

Werry, C., and Mowbray, M. (2001). *Online Communities: Commerce community action, and the virtual university*. Upper Saddle River, NJ.: Prentice Hall

Wolcott, L. L. (1997). Tenure, promotion, and distance education: Examining the culture of faculty rewards. *The American Journal of Distance Education, 11*(2), 3 – 18.

Appendix A

Online Faculty Survey Questions

1. Gender:
o Female
o Male

2. Age:
o Under 25
o 25-35
o 36-45
o 46-55
o 56-65
o Over 65

3. Content Area (If you answered "Other" to question 3, please specify your content Area)

o Math/Science – includes Engineering-Technology-Health
o Humanities
o Business/ Professional Development
o Art
o Social Science
o Other

4. I taught this course through a (college or institution type)
o University Center
o University College
o Health Science Center
o College of Technology
o Specialized College
o Statutory College
o Community College
o Other

5. What was your level of personal computer skills before developing this online course?
o High – Quite competent – experience with the Internet
o Average – Some knowledge of one or more applications
o Low – Had used a personal computer
o Zero – Had never used a personal computer

6. Overall I was very satisfied with teaching this online course.
o Strongly agree
o Agree
o Neutral
o Disagree
o Strongly disagree

7. How many students were in this course?
o 1-10
o 11-20
o 21-30
o 31-40
o Over 40

8. How many times have you taught this course online through the online program?
o This was my first time.
o This was my second time.
o This was my third time.
o Fourth or more.

9. Overall my students learned a great deal in this online course.
o Strongly agree
o Agree
o Disagree
o Strongly disagree

10. If you have ever taught this course in the classroom, how would you compare your online students' performance to the performance of your classroom students?
o My online students performed better
o No difference
o My online students did not perform as well
o I have not taught this course in the classroom

11. Compared to the classroom, the preparation time for this online course took
o Much more time
o More time
o About the same amount of time
o Less time
o Much less time
o I did not develop this course
o I do not teach in the classroom

12. Compared to the classroom, teaching this course took
o Much more time
o More time
o About the same amount of time
o Less time
o Much less time
o I do not teach in the classroom

13. Compared to classroom-based teaching, rate your level of interaction with your online students
o Much higher
o Higher
o About the same
o Lower
o Much lower
? I do not teach in the classroom

14. Compared to classroom-based teaching, rate the level of interaction between your online students
o Much higher
o Higher
o About the same
o Lower
o Much lower
o I do not teach in the classroom

15. How many hours would you estimate you spent developing your online course?
o 0-30
o 31-60
o 61-90
o 91-120
o 121-150
o More than 150

16. When you began teaching your online course, to what extent was your course complete?
o 100%
o 75%
o 50%
o 25%
o Less than 25% complete

17. Do you think the online environment is appropriate for teaching your course content?
o Yes
o Undecided
o No

18. Would you like to teach an online course again?
o Yes
o Undecided
o No

19. Would you recommend teaching online to a colleague?
o Yes
o Undecided
o No

20. How satisfied are you with online teaching in general?
o A great deal
o Somewhat
o Neutral
o Not very much
o Not at all

21. How did you come to develop this online course?
o I was asked to/required to
o I volunteered

22. Which of the following was your primary reason for teaching this course online? If you answered "Other" to question 22, please specify your primary reason for teaching this course online:
- o Curiosity
- o Marketability of the skills
- o Wanting/ needing to telecommute
- o Course is only offered online
- o Interest in technology/Internet
- o Research
- o Fear of being left behind
- o Interest in online teaching and learning
- o Other

23. Overall, how satisfied are you with the online program support and services?
- o A great deal
- o Satisfied
- o Neutral
- o Not very satisfied
- o Not at all

24. Do you feel technical difficulties made it more difficult to teach in this environment than in the classroom?
- o Not applicable – I did not have any technical difficulties
- o Not applicable – I had technical difficulties but they did not affect my teaching
- o Not any more difficult than in the classroom
- o Yes – some somewhat more difficult
- o Yes – much more difficult
- o I do not teach in the classroom

25. Compared to the classroom how well did you get to know your students online?
- o Much better
- o Better
- o The same
- o Not as well
- o Not at all
- o I do not teach in the classroom

Instructions - please provide a response to the following statement.

26. In addition to text, this course presented content by using other media (for example - graphics, animation, audio, or video).
- o Strongly agree
- o Agree
- o Disagree
- o Strongly disagree

27. Developing and teaching this online course provided me with an opportunity to reflect on how I teach in the classroom.
- o Agree strongly
- o Agree
- o Neutral

o Disagree
o Disagree strongly
o I do not teach in the classroom

28. Think about similar courses you have developed for classroom-based delivery, relative to those courses, how likely were you to systematically design instruction before teaching?
o Much more systematic design of instruction online
o More systematic design of instruction online
o About the same
o Less systematic design of instruction online
o Much less systematic design of instruction online
o I do not teach in the classroom

29. I believe developing and teaching this online course has or will help me improve the way I teach in the classroom.
o Agree strongly
o Agree
o Neutral
o Disagree
o Disagree strongly
o I do not teach in the classroom

30. Developing and teaching this online course provided me with an opportunity to consider alternative means of assessment.
o Agree strongly
o Agree
o Neutral
o Disagree
o Disagree strongly

31. Developing and teaching this online course made me feel isolated from my students.
o Agree strongly
o Agree
o Neutral
o Disagree
o Disagree strongly

32. Developing and teaching this online course provided me with an opportunity to consider alternative means of instruction, i.e., new learning activities.
o Agree strongly
o Agree
o Neutral
o Disagree
o Disagree strongly

33. The course management software is very difficult to use.
o Agree strongly
o Agree
o Neutral
o Disagree
o Disagree strongly

34. It is possible to work offline in the course management software (i.e., to work on your course while disconnected from the internet). The ability to work offline is very important to me.
- o Agree strongly
- o Agree
- o Neutral
- o Disagree
- o Disagree strongly

What was one thing the "drove you nuts" about the course management software:

The authors would like to express their gratitude to Dr. David Porush, Executive Director of SUNY Learning Environments and the staff of the SUNY Learning Network for their assistance with this research project.

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

Structure, Content, Delivery, Service, and Outcomes: Quality e-Learning in higher education

Colla J. MacDonald and **Terrie Lynn Thompson**
University of Ottawa
Canada

Abstract

This paper addresses the need for quality e-Learning experiences. We used the Demand-Driven Learning Model (MacDonald, Stodel, Farres, Breithaupt, and Gabriel, 2001) to evaluate an online Masters in Education course. Multiple data collection methods were used to understand the experiences of stakeholders in this case study: the learners, design team, and facilitators. We found that all five dimensions of the model (structure, content, delivery, service, and outcomes) must work in concert to implement a quality e-Learning course. Key themes include evolving learner needs, the search for connection, becoming an able e-participant, valued interactions, social construction of content, integration of delivery partners, and mindful weighing of benefits and trade-offs. By sharing insights into what is needed to design and deliver an e-Learning experience, our findings add to the growing knowledge of online learning. Using this model to evaluate perceptions of quality by key stakeholders has led to insights and recommendations on the Demand Driven Learning Model itself which may be useful for researchers in this area and strengthen the model.

Quality has been defined in terms of the design of the e-Learning experience, the contextualized experience of learners, and evidence of learning outcomes (Carr and Carr, 2000; Jung 2000; Salmon, 2000). Quality and design of e-Learning courses, however, are sometimes compromised in an " . . . effort to simply get something up and running" in response to pressing consumer demands (Dick, 1996, p. 59). Educators and researchers have voiced concern over the lack of rigorous evaluation studies of e-Learning programs (e.g., Arbaugh, 2000; Howell, Saba, Lindsay, and Williams, 2004; Lockyer, Patterson, and Harper, 1999; Robinson, 2001). McGorry (2003) adds, "although the number of courses being delivered via the Internet is increasing rapidly, our knowledge of what makes these courses effective learning experiences is limited" (p. 160). In an economic environment marked by intensive competition between educational institutions, producing and ensuring quality e-Learning programs will be a competitive advantage to attract learners to post secondary institutions (Daniel, 1996; Duderstadt, 1999).

In this study we used a credible model, the Demand-Driven Learning Model (DDLM), (MacDonald, Stodel, Farres, Breithaupt, and Gabriel, 2001) and its companion evaluation tool (MacDonald, Breithaupt, Stodel, Farres, and Gabriel, 2002) to design and evaluate an online course. Several data collection methods were used to understand the experiences of key stakeholders in this case study: learners, design team, and facilitators. In addition to adding to the growing knowledge of online learning, our findings highlight additional elements that could be incorporated into the DDLM to further refine the model.

Review of the Literature

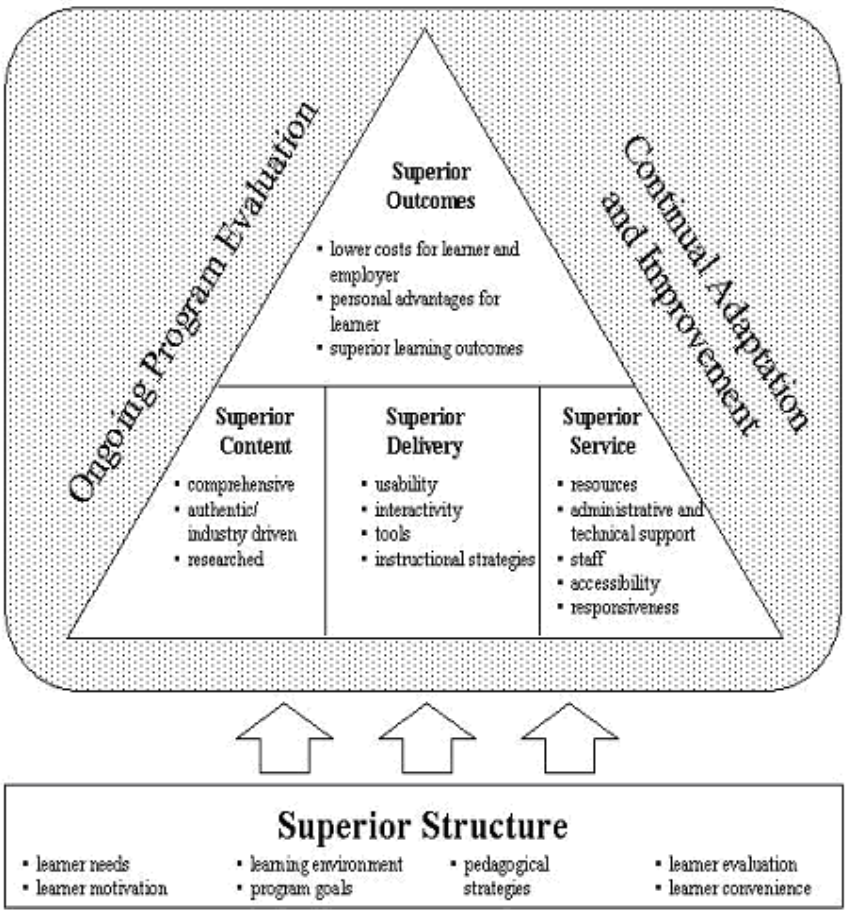
The availability of well-designed, effectively implemented, and efficiently delivered online courses is essential in order to satisfy the unique needs of growing numbers of adult learners (Daugherty and Funke, 1998; Palloff and Pratt, 2001). Some academics, however, regard the "potential benefits [of e-Learning] as utopian claims and unlikely to hold true in practice" (Furnell, Evans, and Bailey, 2000, p. 283). Still others caution that because the pedagogical soundness of e-Learning has not yet been fully investigated, there is not enough empirical evidence to support claims of its effectiveness (McElhinney and Nasseh, 1999; Noble, 2002; Reeves and Reeves, 1997; Speck, 2000).

The literature reveals a distressing gap between the use of technology and sound pedagogical models (Khan 1997; Salmon, 2000; Willis 2000). Several researchers have written about the need for quality standards to ensure the academic integrity of e-Learning programs (Benson, 2003; Carstens and Worsfold, 2000; DeBard and Guidera, 2000; Salmon, 2000; Speck, 2000). Defining these quality standards, however, can be challenging. In a qualitative study of 13 participants from six different stakeholder groups engaged in developing an online degree program, Benson (2003) found that although everyone wanted quality courses, stakeholders brought different definitions of quality, which impacted the planning process and shaped the learning experiences.

Because of these challenges, evaluating and assuring quality in e-Learning programs has become a critical issue. Not only is evaluation critical for program improvement and long-term success (Rovai, 2003), Marquardt and Kearsley (1998) suggest "evaluation is particularly important in the context of technology use because it [technology] is highly susceptible to fads and marketplace trends" (p. 246). Robinson (2001) reports that in her three-year international study of distance learning initiatives, evaluation efforts were limited, largely due to lack of time and expertise.

McGorry (2003) emphasizes that "theory-driven empirical research is necessary so that criteria for developing effective Internet-based programs are established"(p. 160). The DDLM proposes five inter-related dimensions that in concert, create a high-quality e-Learning experience: structure, content, delivery, service, and outcomes. In this case study, each of these dimensions is applied to a new e-Learning course and explored in-depth. Initial research demonstrates that the DDLM (see Figure 1) provides a psychometrically sound evaluation tool that can be used to assess the quality of e-Learning against reputable guidelines (Breithaupt and MacDonald, 2003).

Figure 1. The Demand Driven Learning Model (DDLM) (MacDonald, C. J., Stodel, E., Farres, L., Breithaupt, K., and Gabriel, M. A. (2001). The demand driven learning model: A framework for Web-based learning. *The Internet and Higher Education, 1*(4), 9 – 30.



In the DDLM, the *structure* of an e-Learning course provides the necessary foundation for quality content, delivery, and service. Structure includes anticipating learner needs, using appropriate pedagogical strategies, creating a positive learning environment, and conducting regular learner evaluations. The *delivery* of an e-Learning course includes usability, interactivity, and tools. The *content* of an e-Learning course should be comprehensive, authentic, and researched. *Service* includes resources, administration and technical support, accessibility, and responsiveness. Finally, the *outcomes* of an e-Learning course should include lower costs for the learner and employer, personal advantages, and achievement of learning outcomes.

The purpose of this study was to address the need for quality assurance in e-Learning. Specifically we wanted to:

- Use a research-based and tested learning model and evaluation tool (the DDLM) to evaluate an e-Learning course in a university setting
- Synthesize the experiences and needs of key stakeholders

- Provide recommendations to make the DDLM a more comprehensive quality standard.

Research Design

Merriam (2001) comments that the case study is useful for studying learning innovations. Creswell (1998) defines a case study as an exploration of a "bounded system . . . through detailed, in-depth data collection involving multiple sources of information, rich in context" (p. 61). The researcher's goal is to understand the complexities of the case (Stake, 2000). As we studied one group of people in a unique setting the results cannot be generalized (Wolcott, 1990). Nevertheless, Merriam advises that by providing detail, readers can determine themselves "whether the research setting sufficiently resembles their own situation to warrant adopting the same practices" (p. 222).

The unit of analysis in this case study was EDU 5199, the Synthesis Seminar, the last of 10 courses required to obtain an MEd degree at the University of Ottawa. Because this was the first course in the program to be offered online, learners had completed all other coursework in a F2F format. As the culminating course, participants reflect on their development and demonstrate that they can apply their learning to topical issues in their professional domain.

Participants in this case study were the learners, design team, and facilitators. The 19 learners in the 13-week course were primarily working adults. Thomas (1993) refers to adult education as "any form of education participated in by persons regarded as adults in the society to which they belong" (p. 25). In this study, we refer to the typical MEd student as an adult learner – those learners with at least one previous university degree, many who have family and community responsibilities, and the majority working in full-time jobs. The motivation for designing the course online was to meet the needs of these busy working learners. Attrition was low; 20 learners registered and only one dropped out in the third week reporting demands from her job and family as her reason.

The course design team was comprised of three members. Colla, a professor with 24 years of university level experience, has been researching, publishing, and supervising graduate students in the e-Learning field for several years. This was her first hands-on online teaching experience. The teaching assistant (TA), Terrie Lynn, was completing her MA. She works as a learning consultant, and has designed and delivered courses in several e-Learning media. The course developer, Sylvie, is an experienced *WebCT* instructional designer. The facilitation team consisted of Colla, assisted by Terrie Lynn. Salmon (2000) refers to an e-moderator as "the champion who makes the learning come alive" by enabling 'meaning making' rather than content transmission (p. 11). Accordingly, Colla referred to herself as the e-moderator, rather than professor or instructor.

Data Collection and Analysis

The literature suggests a number of strategies to increase the trustworthiness of a study. Specifically addressing case studies, Stake (1995) recommends member checks and triangulation. Interview participants were encouraged to revise and elaborate on their interview transcripts. Because each data collection strategy "makes the world visible in a different way" (Denzin and Lincoln, 2000, p. 4), relying on multiple strategies helped construct a multifaceted understanding of this e-Learning event. Data was collected in three ways: interviews, analysis of course transcripts and other course documents, and online survey instruments, including the DDLM online survey.

To increase credibility, the semi-structured interviews were conducted by a research assistant who was not involved in the course design or delivery. These interviews allowed us to follow-up on themes that emerged from the course generated data. For example, one re-occurring theme was that learners felt they missed F2F contact. Interviews provided the opportunity to ask learners to explain in greater detail what it was about F2F contact that they missed; we were able to ensure a more complete picture of the learners' perspectives emerged.

The three members of the design team as well as seven learners were interviewed six weeks after the course finished. Purposeful sampling was used to select learners who varied in age, gender, depth and breadth of course activity, previous e-Learning experience, course achievements, and concentration (the MEd program includes four concentrations: Administration, Teaching and Learning, Counselling, and Second Language Teaching). Eight interviews were conducted in-person, one by telephone, and one by email. Oral interviews were audio taped and transcribed.

Course documentation comprised the second data source and included postings in the e-discussions, emails sent and received by the e-moderator and TA, and course participation data. Other documents available for analysis included course design files, emails between the design team members, and course documents.

The third data source was the online surveys. The course was designed to include several evaluation mechanisms, creating what Levy (2003) refers to as a "close connection between learning and research activities" (p. 101). A required activity in the course, we had 100 percent completion of the three *temperature checks*. Completed in weeks 3 and 6, two of the temperature checks were short Likert-scale online surveys with a few open-ended questions. Although we could determine if a learner had completed the survey, responses were anonymous. The third temperature check was a reflective posting in the week 9 discussion group. In addition to the temperature checks, the DDLM companion survey (MacDonald et al., 2002) was adapted to align with this course. Learners completed this online survey, called the *e-Valuation*, during the final week of the course. Designed to evaluate the five dimensions of quality outlined in the model (content, delivery, service, structure, and outcomes), it included 41 six-point Likert questions and five open-ended questions. Data pulled from these online surveys is identified in the text as follows: *tc1*, *tc2*, or *tc3* refers to temperature check 1, 2, or 3; *e-V* refers to the final e-Valuation.

Merriam (2001) describes data analysis as the process of meaning making. The first grouping of the data was created as we re-read the data and started to see connections. We tried to find commonalties and concepts that would unite many divergent perspectives. Not surprising, the data did not slot neatly into categories. Themes evolved as we continued to work with the data, and we returned to the data to search for positive and negative evidence. For example, once community surfaced as a potential theme, we re-analyzed the interview transcripts to understand how the learners described the sense of community they felt. This level of analysis resulted in the creation of unifying concepts that more accurately encompassed the meaning emerging from the data. It also allowed us to search for connections between and among participants. Seven themes eventually emerged that attempt to capture the range of experiences and meanings of the participants.

As the research focus of this study was to use the DDLM as an evaluation tool, the model did frame some of our data analysis work. This framework, however, did not restrict the themes that emerged. Schwandt (2000) comments that we invent models to make sense of experience and we "continually test and modify these constructions in light of new experience" (p. 197). The five dimensions in the DDLM were broad enough to enable a grouping of all the themes that emerged.

In some instances the data highlighted aspects of e-Learning not reflected in the current DDLM model; these insights are presented in the Conclusion as recommendations for future work on the model.

Wolcott (1994) suggests that analysis reveals "key factors and relationships between them" (p. 10) and by discussing these relationships a case study presents "the potential for understanding something beyond it" (p. 33). Direct quotations are used throughout to present the voices of the participants, who have been given pseudonyms. As the two authors played dual roles as researchers and participants in this online learning experience, we have used our real names throughout this document, guided by Charmaz and Mitchell's (1997) argument for audible authorship. They state that voice "clarifies the researcher's place in, and experience of, that action" (p. 208).

The Context

Work began seven months before the course was to be offered. At that time, the only e-Learning technology supported by the university was *WebCT*, which established the online environment. Guided by the DDLM, design decisions linked this e-Learning technology with sound pedagogical principles.

The Synthesis Seminar, the final course in the MEd program, requires learners to reflect on their professional development throughout the program and demonstrate that they can apply new learnings by writing a 25-page research paper. There was no prescribed course content to be delivered. The content was primarily constructed by the learners as they wrote their paper and shared insights in the discussion groups and consequently, knowledge built throughout this learning experience was directly related to professional and personal interests. The only content provided by course developers were brief online documents designed to support learners in this constructivist learning environment; some provided guidance for writing sections of the paper while others provided insights into successful e-Learning (e.g., *About Netiquette*, *Tips for WebCT Discussions*). Even though this was an asynchronous course a sense of timing was established by creating a course chunked into 13 weekly modules, each ending Wednesday at midnight. The Road Map provided structure by identifying the learning events for each module.

As mandated by the University, this pass/ fail course was based on assessment of the research paper. To help learners produce the best possible paper, a series of assignments guided them step-by-step through the process of writing an academically rigorous research paper. Learners were required to: (a) participate in online activities; (b) develop a conceptual framework; (c) create an outline of the paper; (d) submit a first draft of the paper; (e) develop an online poster presentation, and (f) produce a final paper. All assignments were evaluated and extensive feedback was provided on each. Although only the final paper was given a grade, the cumulative assignments facilitated formative assessment and enabled learners to build their final papers in stages as they continually refined their research and arguments. To help define "online participation," several online documents were available (e.g., *Building a Learning Community*, *Hints for Successful e-Learning)*. As there was no mark assigned per se to online participation, we relied on several strategies to encourage it: (a) online participation was included in the list of course requirements to emphasize its importance; (b) we also tried to design online forums that learners would find useful and that had the potential to engage a diverse group of people in a meaningful dialogue that would enhance their research paper; and (c) the focus of each discussion group was highlighted in the course outline and Colla posted frequent reminders and encouragement.

A constructivist philosophy underlies the DDLM. While there are different viewpoints among constructivists (Barab and Duffy, 2000), Levy (2003) suggests they all acknowledge that learning is active, situated, and social. She adds that "in practice this leads to a commitment to participatory and dialogic approaches to learning design and facilitation, including . . . participation in learning communities" (p. 93). Consequently the following strategies were implemented to facilitate a sense of community: (a) learners were grouped into triads and expected to provide constructive feedback and support to their triad members; (b) dialogue in the discussion groups was emphasized; and (c) learners were able to meet the facilitation team and other learners during an initial three-hour F2F class.

The course design included an optional three-hour long F2F orientation session in the first week, designed to help ease learners into their first e-Learning experience and ensure a successful online experience. While the intent was to enable learners to participate online at anytime and from anyplace, in order to facilitate community and orient them to *WebCT*, this F2F session became a course design element. In this respect, offering one of the thirteen classes F2F reflects a blended approach. It is possible, however, for learners to successfully participate in the online course without attending this F2F session.

The triads were designed to provide feedback and support mechanisms. Learners self-selected triad members during the initial F2F session. With one learner dropping out and learners grouping themselves by interest areas there were five triads of three members, and two triads of two members. Triad members were expected to give each other feedback on various course assignments. Learners used special forms to provide each other feedback and attached the feedback forms they have received when they submitted their assignments. The feedback they were given by their triad members and the quality of the feedback they provided to their triad members was assessed.

Eight one-week discussion groups were strategically placed throughout the course. In the discussions, learners were asked to share: 1) aspects of their paper; 2) opinions and insights; 3) their journey as e-learners; and 4) how their research related to challenges in their professional work. The facilitation team was responsive and active in the discussion groups. Learners also used *WebCT* email and chat tools to dialogue.

To help learners orient themselves to the e-Learning environment we created *E-Venture*, a series of activities learners completed in the first week to familiarize themselves with *WebCT*. One of these activities was to create and post an e-Page, which included a short introduction and image (optional). We also tried to anticipate challenges learners might face in writing the research paper. This led to the design of tools such as the online American Psychological Association (APA) self-assessment to help learners figure out the nuances of academic referencing. Strategically placed at three-week intervals, three temperature checks gave learners an opportunity to provide learner feedback, enabling us to respond to learner needs as the course progressed. Toll free technical support for password, connectivity, and hardware problems was provided by the University help desk, although it was not a 24 x 7 support service.

Findings

Learners had their own perceptions of quality and used other learning experiences as benchmarks. One learner comments: "I have taken one other course via *WebCT*. The organization of EDU5199 was exceptional and much higher than my expectations!" (e-V) Another shares, "I really felt supported to rise towards the next step. Ironically, I felt more support than I have in other courses,

even though there was no face-to-face contact" (e-V). Learners believed that the design and facilitation teams demonstrated a commitment to quality and continuous improvement. J. explains:

> I think they were very open to suggestions of how this could be improved and what was working well . . . Asking people to comment in this fashion is a very good sign that they're trying to take where it is and make it easier for people . . . It looks easy to the outside person like me – all the professor had to do was start this up and then step back. But that took a lot of work at the front end and there's obviously a commitment too at the tail end, going back and trying to refine and change(Interview).

Learners reported that this online course was a positive experience. For example: "This has been a challenging and rewarding experience. In my opinion, this is how e-Learning should be. We had relevant work to do, great organization and support, and almost no technical glitches" (Posted by C. on Sunday, December 01, 2002: 13:50 p.m.). For one learner however, the stress caused by having to take a course online was perceived as too great:

> I learned a lot from it, but to me the stress that I suffered because of having to go through that [online course] . . . It just didn't work for me . . . And people I have talked to loved the course, but it did not meet my needs (M., interview).

While the standards in this online course were extremely high, learners felt they were set up to succeed and all passed. In her opinion, Colla found that the quality of the learners' work was high in comparison to other graduate courses she had taught. For example, her perception was that the quality of the first drafts of the learners' conceptual frameworks were strong. Several factors might help explain this perception. First, Colla developed an online document that included a step-by-step process and examples of conceptual frameworks. In F2F courses, such detailed upfront documentation rarely occurs as the professor can rely on his/ her knowledge and experience to react to learners concerns and questions. However, perhaps learners in this course benefited from information organized and presented in this written readily accessible format. Due to the online nature of the course, the design team also organized learners into learning triads to provide additional support. A second reason the quality of the assignments was higher may be due to learners providing feedback to others in their triad prior to submitting assignments.

The DDLM model provides a framework for exploring the findings in more depth. Seven themes emerged from the data: a) evolving learning needs; b) search for connection; c) becoming an able e-participant; d) valued interactions; e) social construction of the course content; f) integration of support by delivery partners; and g) mindful weighing of benefits, drawbacks, and trade-offs. These themes will be discussed under the five components of the DDLM: structure, content, delivery, service, and outcomes.

Structure

This section discusses two structure-related themes that emerged: evolving learning needs and a search for connection.

Evolving learning needs

In the fall term, EDU5199 was the first course offered completely online and was available only in an online format. In the interviews, all but one learner expressed feeling angry or anxious. P., however, was happy when he heard the news: "There was no stress at all. If I could have picked to do every course online I would have done that" (Interview). Although learners reported being told they could take the course F2F if they waited until the next term, for most this was not a viable option. Given a choice at that point, most would have elected to take this course F2F. Moreover, learners were made aware that the course was being offered online three weeks prior to the first class, which seemed to add to their anxiety level.

Although the majority of learners reported feeling forced to take the course online, when it was over, most saw it as a feasible, and even enjoyable, learning experience that they would try again. It seems learners' reactions to their first e-Learning experience reflect both the perceived attractiveness of the learning option as well as "do-ability." Most learners experienced a shift in their attitude, in part because of the structure and design. K. explains:

> During the first class I felt 'Wow this is too much. I don't know if I'm going to make it' . . . Once you were online though, I found that that was completely gone. Everything was set in place and if you had any inquiries you could contact someone. So the design of the whole online program was excellent, really easy to use (Interview).

Our findings suggest that many learners experienced an initial *doubting* phase when they wondered if they could do this e-Learning course. Learners' perceptions of their own e-Learning competence and attitude toward this new learning experience seemed to influence their level of confidence which in turn influenced how they engaged in the course. D. and J. admitted to limited technical competence, yet looked on this e-Learning experience as an adventure and with a few early successes felt a sense of progress, and eventually competence. The data suggests that perceptions may shift during the experience. J. shares, "I went from nervousness about it to feeling a bit better, to feeling quite good about it towards the end (Interview).

In contrast, M. ended up feeling defeated. Although her self-reported technology skills were similar to D. and J., the technology seemed to create insurmountable barriers despite the level of effort she put in: "I tried so hard and even with trying so hard there were just too many obstacles" (Interview). As the course progressed her confidence decreased while her stress increased. Her initial feeling of "horror" at learning this would be an online course never abated. She admits that she would not rush into taking another course online.

Studying learners' perceptions of starting an online course, Conrad (2002) also found that some learners felt fear and anxiety; others were eager and excited. Students also experienced "initial discomfort with the online medium" (p. 215). Our data supports her finding that courses with "good beginnings" are characterized by organization and social ambience (p. 215). Consistent with Palloff and Pratt's (2001) assertion, it seems some learners struggle, while others adapt successfully and easily to the online setting.

Search for connection

Design efforts focused on fostering a sense of community. Learners reported that the triads were invaluable and did foster a sense of working together towards a common purpose. There were

differing views, however, on the value of the e-discussions and three challenges related to fostering community via the e-discussion venue emerged. The first challenge of learning to manage the volume of postings is logistical in nature. Several learners felt guilty about not reading and responding to all the postings. All shared the strategies they used to cope with the volume.

Bridging the diversity of professional backgrounds (teachers, school administrators, and counselors) and research topics presented a larger challenge to fostering a sense of community. For some learners, a lack of interest or expertise in the topics areas explored by other learners created a barrier to dialogue. Learners were uncertain how to respond and some doubted that their comments would be perceived as credible. Several learners, however, not only managed to bridge this apparent gap, they valued the diversity of perspectives and enjoyed the exchanges with others. They drew on their own experiences to connect with the issues that others were exploring.

Third, the search for connection with others in the course seemed to influence the way people participated and the resulting feeling of community. Some learners found it more difficult to establish a social context in this online environment. A few learners attributed this to lack of non-verbal cues, while others felt that more F2F time together at the beginning would have provided a stronger foundation. Many learners met their triad members in-person or communicated synchronously by telephone. Some learners shared that they needed to work harder to find and create the exchanges that seem to occur so naturally in a F2F session. J. elaborates:

> I like to be able to sit back and listen to the exchange of ideas among people . . . Initially I didn't find that in this particular setting, because you have to go looking for it and it's in the print form as opposed to engaging in a conversation and dialoguing. That was different for me . . . At the beginning it was more stressful to create that same exchange of ideas that takes place in a classroom (Interview).

One course element that seemed to help participants create a connection with others was the e-Pages. Many of the participants, including the e-moderator, referred back to the e-Pages throughout the entire 13 weeks. This type of bond made the learning experience more real for some participants in this study. Other researchers have also found that bringing participants together F2F before the online component and posting each person's digital picture helps to build an online community (Bichelmeyer, Misanchuk and Malopinsky, 2001; Song, Singleton, Hill and Koh, 2004). In a recent study which examined the perspectives and experiences of 22 learners in an asynchronous online course, Vonderwell (2003) found that students were not comfortable interacting with others they did not know. By turning to synchronous communication modes in their triads, learners in this study instinctively discovered a strategy consistent with Macdonald's (2003) findings of online collaborative learning: a F2F meeting, teleconference, or online chat helped learners establish a working relationship before working online.

Macdonald (2003) also found that individuals contribute to the group process in several ways including group moderation, responding encouragingly to others, or locating information. In exploring how learners attempted to span diverse interests, our study goes one step further by highlighting the importance of a common language in building connections, and ultimately a community. Wenger (1998) suggests that coherence in a community comes with mutual engagement, joint enterprise, and a shared repertoire (words, ways of doing things, stories). While learners in this study were dispersed across four professional domains, three 'shared repertoires'

or common languages seemed to emerge and learners used these to connect with others: emotional support, technology, and the process of e-Learning.

Even though participation in the discussion groups was not evaluated per se, it was a course requirement and our findings support assertions in the literature that some learners may not feel obligated to participate and some will be more enthusiastic participants than others (Macdonald, 2003; Vonderwell, 2003). Learners reported that they participated in the online discussion groups largely because this was a course requirement. More spontaneous and genuine participation, however, occurred when they found them useful, were interested in what others were doing, felt they had something to contribute, wanted to provide support to others, and in order to maximize the return on their tuition investment. There was also a sense in this study that learners participated in the spirit of reciprocity: 'give in order to receive.' Synthesizing the findings of several case studies, Hammond (2000) concluded that learners who focused on the opportunities provided by the discussion groups became "communicative learners" while "learners who focused on the constraints perceived a high threshold to cross before they could join in" (p. 256). Our findings illustrate the diverse factors that learners weigh when deciding on their level of participation and the value they derive from a joint learning endeavor.

Some learners in this study seemed to bring F2F expectations with them. In her personal inquiry into e-Learning, Mann (2003) shares that she tried to "engage with others through written communication as if I was in a F2F conversation" (p. 118). She argues that, "A whole new communication process has to be learned. It is not simply a process of shifting from speaking and listening to reading and writing" (p. 119). While most learners felt there was a sense of community in this e-Learning experience, the findings highlight how ability to connect and dialogue with others influences if, and how, a sense of community emerges. It seems that being able to dialogue meaningfully in the online environment is a pre-requisite for building community. Although community was planned into the design of this course, more active facilitation and purposeful focus on this dimension was likely required to help it take root and blossom.

Delivery

Two themes illustrate how delivery influenced the quality of this online learning experience: becoming an able e-participant and valued interactions.

Becoming an able e-participant

For some learners a source of anxiety was *perceived* technology incompetence and an inability to confirm whether they had the necessary technology skills to be successful in this e-Learning experience. Learners were not the only one who doubted their e-Learning skills. Colla shares: "[The learners] think they were intimidated or scared? I was scared too. I'm not a technology person and never ever pretend to be and to take this on you have to be crazy. So I was scared too" (Interview).

Despite technology skill building activities, such as e-Venture in the first week, for many learners there were two learning curves in this course: the technology and the research paper. Comments in the first temperature check (week 3) reveal that computer-related struggles seemed to eat up time and energy often at the expense of the paper. Even as learners expressed frustration at coping with the challenges of a new learning environment, for many there was a realization that the technology was becoming less of a barrier:

> It was difficult in the beginning . . . but by the end of the course I felt very comfortable with everything . . . After 3-4 weeks, I was right on track and felt I could do it very competently and with speed (D., interview).

Three weeks into the course, much of the stress over the technology and consequently the stress in the class appeared to subside. Interestingly, learning to use PowerPoint to create a conceptual framework, as well as basic word processing skills, seemed to create more obstacles than using *WebCT*. For some, this challenge eclipsed all others. By week 6, midway through the course, there was a positive shift in the learners' confidence and ability to use *WebCT* (see Table 1). Now 15 participants compared to 9 three weeks earlier, were feeling comfortable with the online environment.

Table 1. Growing Confidence in the e-Learning Environment

I feel confident in my ability to use WebCT to participate in this e-Learning experience.	Temperature Check 1 Week 3 n=20	Temperature Check 2 Week 6 (%) n=19
Strongly Disagree	1	1
Disagree	4	1
Neutral	6	2
Agree	6	12
Strongly Agree	3	3

The data suggests that not everyone slides easily into this e-Learning medium. There is a sense of adjustment and struggle and the biggest hurdles varied from learner to learner. For some, it was dealing with hardware, software, and networks glitches; for others, adjusting to the lack of F2F contact. Some learners seemed to cope better than others. All became more cognizant of their computer skills. Learners also shared their emerging sense of self as an e-learner. With this increased self-awareness they developed strategies. Some focused on time management and although they knew what they needed to do, acknowledged that this online course ended up fitting haphazardly around the ebb and flow of other priorities. Several consciously bettered their technology skills.

For some participants there was a sense of progression. They acknowledged that next time they would be more proficient and therefore able to participate more meaningfully, taking full advantage of the online course elements. Budding e-Learning ability is referenced in the literature. Mann (2003) suggests that becoming an able e-participant takes time and reflects: "Potential was not realized, for in my mind I was still learning the ropes afforded by this new medium, was still translating it out of my previous experience, rather than experiencing it in its generative newness" (p. 121).

Most learners in our study did not face any major technology problems and shared that the e-Learning interface (*WebCT*) was easy to use and relatively problem-free. Most learners also indicated that they would consider taking other courses online. The findings support the literature that suggests that learner satisfaction with Internet-based courses will influence their perspectives of the usefulness of the technology for e-Learning and whether they take subsequent courses in this format (McGorry, 2003; Song et al., 2004). As Rheingold (2000) states, the way a technology

will be used depends on how well the "first people who are using it succeed or fail in applying it to our lives" (p. xxvii).

Valued interactions

Over the 13 weeks the survey, data suggests that the number of learners who believed they were engaged in this learning experience varied from 14 to 16. Despite this level of engagement, the data also reveals that half of the learners were either not sure or did not think they had enough interactivity with others (see Table 2).

Table 2. Perceptions of engagement and interactivity

	Temperature Check 1 Week 3 **I am engaged in this learning experience.** n=20	Temperature Check 2 Week 6 **I am engaged in this learning experience.** n=19	e-Valuation Week 13 **The course engaged me in the learning experience.** n=18	e-Valuation Week 13 **There was sufficient interactivity with my classmates.** n=18
Strongly Disagree	0	0	0	0
Disagree	0	1	1	5
Neutral	4	2	3	4
Agree	13	12	2	7
Strongly Agree	3	4	12	2

Perceptions of interactivity were in part influenced by the virtual nature of the exchanges. One learner comments: "I am feeling slightly isolated without the social aspects of learning, in spite of the fact that my triad has met several times in the chat rooms" (tc1). As the course progressed, the desire for F2F contact became more pronounced by some learners. Barely mentioned in the first temperature check, by week six, F2F meetings came up repeatedly as one suggested improvement. Perhaps it is the synchronous nature of F2F contact that is missed, as this comment suggests: "I do miss the F2F contact when I need some feedback or clarification right away" (tc2).

In the interviews, learners revealed several factors that influenced their interactions in the virtual space. Some learners did not participate because of divergent interests. How others might perceive them and uncertainty about the context in which others might be reading their comments also emerged, suggesting that perhaps the foundation of trust and support required to nurture a community was not strong enough for some learners. Other learners referred to time constraints and being selective in their interactions. JS. admitted that he was a lurker, reading more than he posted, and that his level of interaction was a conscious decision: "I didn't gain as much as I might have . . . I think I might have let the group down in that respect. But you also have to weigh your life demands as well" (Interview).

The data suggests that creating vibrant and open online interaction is a challenge given time constraints and a sense of uncertainty about how input would be regarded by others. The

interview data, however, also suggests that some learners found the degree of online interaction required was good. Perhaps learners' perceptions of the level of interactivity were influenced by how much they participated in the online discussions and how much they valued this type of interaction. CK was an international student and valued the text-based nature of course: "I can follow this course without losing track. Since all texts were written, I could go back to some points that I need to reread" (Interview). However, she confined her interactions to her triad members, and primarily with the one person she knew from a previous F2F class. In her interview she shared: "As for the other classmates, unfortunately, I had no relationship with anybody." Even though she adds: "I am sure the discussion groups facilitates interactivity among us," she admits that the "lack of communication with the other learners" was the least rewarding aspect of the course.

These findings raise questions: What strategies are necessary to facilitate an e-Learning course that encourages learners to value online interactions? Might the asynchronous text-based element of the medium be problematic? Would anything other than F2F contact and interactivity be sufficient? J. comments: "I can think of courses where a big part of it has been the professor and the interaction. I don't know that with Colla. I didn't get enough time to work with her F2F" (Interview). Despite the email dialogue between the e-moderator and J., comments they shared in the discussion groups, and the extensive amount of personal feedback she provided to him on five assignments, he is still not sure he really interacted with her. Differing perceptions of interaction and valued interaction point to the need for further research in this area.

McGorry (2003) acknowledges that creating interactivity, crucial to long-term interest in e-Learning, is one of the greatest challenges. McLoughlin and Oliver (1998) argue that the quality of an e-Learning experience is related to the social climate and the "opportunities created for interaction and exploratory talk between participants" (p. 134). The design team in this case study was focused on creating an interactive learning experience, a key component of the DDLM. Interactivity as outlined in the DDLM includes the interaction between the learner and other learners, the facilitators, and the content. The findings in this study illustrate the challenges in building an interactive e-Learning experience that appeals to everyone. Learners appeared to bring their own beliefs about the interactions they value with the content, themselves, the instructor, the interface, and other learners. Rather than being an all-encompassing concept, interactivity has multiple facets. The data suggests we need to be more precise in facilitating interactivity, which supports Thompson's (2003) finding in her study of online teaching and learning, that attention needs to be paid to the *type* of interactions promoted in the virtual classroom.

Content

The content-related theme emerging from the data is the social construction of the course content. Most course content was constructed by learners as they crafted their paper, exchanged feedback with triad members and the e-moderator, and shared ideas in the online discussion groups. Learners seemed to value the flexible nature of the content, as this comment illustrates: "It was a strength of the course that all of the course content was either directly related to writing the synthesis paper or our personal e-Learning. No time was wasted on irrelevant examples" (e-V). According to the *e-Valuation*, the content seemed to meet most learners' needs, have sufficient breadth and depth, and enabled learners to synthesize what they had learned throughout the MEd program (see Table 3 on the next page).

Table 3. Evaluation of the course content

e-Valuation Week 13 n=18	The course had sufficient breadth and depth.	The course enabled me to synthesize what I learned in the MEd program.	The course met my needs with respect to content.
Not Applicable	0	0	0
Strongly Disagree	0	1	0
Disagree	1	1	1
Neutral	2	4	4
Agree	7	4	8
Strongly Agree	8	8	5

This study provides a rich illustration of a constructivist approach to content. Learners in this study did not absorb knowledge; they constructed it; a key tenet of constructivism (Jonassen, 1991; Jonassen, 1994; Phillips, 1995; Vygotsky, 1978). There is also evidence that the learners' experience was consistent with Fenwick's (2000) assertion that constructivism is characterized by an experience in which learners "construct, through reflection, a personal understanding of relevant structures of meaning derived from his/her action in the world" (p. 248).

This study highlights the challenges of this constructivist approach. The small amount of prescribed course content, coupled with the personal and diverse nature of the topics explored in the papers, made it challenging for learners to find a common focal point as a group. The literature offers some insight. Hung and Chen (2001) suggest *commonality* (shared interests and problems) contributes to a vibrant community. Did the participants in EDU5199 see a valid reason to work together to address a challenge? To some degree, a sense of commonality did emerge in the triads as learners were invested in the feedback process on assignments. Within the large group, however, this sense of common purpose was not well-defined. Our findings indicate that if a key structural component of an online course is community, then the *content*, as well as the learning process and assessment criteria, need to align with this type of learning experience.

Service

Integration of support by delivery partners emerged as a theme that fits within the *service* dimension of the DDLM. Delivery partners in this e-Learning experience included the university technical support and faculty administrative staff. Not all learners interacted with the support staff. The interview data reveals that learners with higher levels of technology skills (i.e., P. and J.) did not seek technical support. Several learners, however, did express concern about the quality of technical support. The data also suggests that most learners built and relied upon a personal support network, which included the facilitation team, each other (triad members and the large group), and "experts" at home and work.

Learners repeatedly commented that they valued and benefited from the support offered by the e-moderator, TA, and their learning triads. Responsiveness of the facilitation team, demonstrated by

quick turn around on questions, concerted efforts to help solve problems, and comprehensive feedback to learners on their assignments illustrates a commitment to service. Table 4 highlights the learners' perceptions of this service.

Table 4. Perceptions of service

e-Valuation Week 13 n=18	The e-moderator was reliable and helpful.	The teaching assistant was reliable and helpful.	Feedback on assignments was quick.	Emails were responded to in a reasonable amount of time.
Not Applicable	0	0	0	0
Strongly Disagree	0	0	0	0
Disagree	0	0	0	0
Neutral	0	0	0	0
Agree	3	1	8	4
Strongly Agree	15	17	10	14

The interviews revealed that several learners with marginal technical skills successfully built support networks. Both D. and J. relied on IT personnel in their schools as well as calling on others in the course. Neither seemed hesitant to ask for help. M. however, did not seem to have a strong personal support network to help her through her numerous software challenges. Furthermore, she was not comfortable asking for help and struggled throughout the 13 weeks:

> My problem was probably that I was too reluctant to let on to [Colla] that I was having difficulties . . . I wouldn't contact her because I just thought I should be able to figure it out by myself. She was very supportive but I didn't reach out . . . I work with special needs kids . . . I did not reach out, which is typical of a learner in difficulty (Interview).

The data also reveals that the design and facilitation teams built an e-Learning support network as well, which included SY., who provided pedagogical assistance as well technical expertise and access to a resource network within the University. Findings also highlight the negotiation of resources that went on to build this support network. Terrie Lynn observes:

> I remember our initial meeting with the e-Learning center and then discovering these kinds of things take money and is there any money to do this? . . . It's not just a matter of creating an online course. This whole infrastructure has to also be created to support whatever you do (Interview).

Colla acknowledges the effort involved in providing the degree of support she did for the learners, admitting that she would be online first thing in the morning and continue to check email and e-postings throughout the day, often "10 times a day." Terrie Lynn provides insight into how the facilitation team juggled their service priorities:

> Colla was so busy marking the papers, and learners have commented so positively on the feedback she's given them, on how detailed it was . . . And that comes at a price. You can't be busy doing that, you know 50 hours a week plus reading all the discussion groups plus troubleshooting people's technical problems plus answering APA questions. I don't know how people who don't have a TA manage. You would maybe compromise by settling for a less interactive experience. But if there had been more time [it would have been good to] follow up [individually] on people who were low participants . . . and just say, "I'm just checking in to see how things are going"(Interview).

While the University technical support and faculty administrative staff are clearly part of an integrated delivery model of e-Learning, it is questionable how these groups see their role. Although they were integrated to some extent into an overall service framework, they are not necessarily prepared or committed to an intensive e-Learning delivery model. This study highlights that an integrated approach to *service* is an essential element of a quality e-Learning experience. Even with quality course design and delivery, shortfalls in the service aspect of a quality learning experience, which often fall outside the direct influence of the facilitators, can have a significant impact on learners' experiences.

In this case study, there was no faculty e-Learning strategy or departmental requirements or incentives to create e-Learning courses. The drive to create an online version of EDU5199 was primarily due to the determination of one professor and her ability to marshal the necessary resources and willingness to take a risk by trying something new. Our findings support the literature that suggests many of these early successes are linked with the enthusiasm and capability of the individual professor (McLachlan-Smith and Gunn, 2001; Robinson, 2001). Robinson observes that strategies used by e-Learning innovators include "working around intransigent procedures, making informal arrangements with selected administrators on a personal goodwill basis," and absorbing some of the administrative work themselves (p. 19). McLachlan-Smith and Gunn comment that learning innovation at the University of Auckland has been driven primarily by early adopters, who, against all odds, created e-Learning courses within the traditional infrastructure.

The findings in this study highlight the challenges faced by the design team in trying to access resources to develop and deliver an e-Learning experience. Observations by learners of the inconsistencies between an online course, on the one hand, and F2F registration systems and technical support that is not prepared for the 24 x 7 nature of e-Learning, on the other hand, support suggestions that institutions must develop e-Learning policies that will "maintain course integrity and quality and also foster innovation in the 'virtual classroom'" (McGorry, 2003, p. 160). Alexander (2001), however, observes that most e-Learning activity is at the course level and only a few institutions recognize that "successful e-Learning occurs within a complex system, composed of many inter-related parts" (p. 241). She concludes that to meet its challenges, higher education e-Learning initiatives will need to move beyond teaching strategies; her framework includes the support and development mechanisms within the entire university context.

Outcomes

One theme emerged to illustrate the outcomes dimension of an e-Learning experience: a mindful weighing of benefits, drawbacks, and trade-offs. Missing F2F contact was an issue that became more pronounced by some learners as the course progressed. It seems some learners missed the fluidity and familiarity of verbal exchanges. But even as some learners commented they wanted

more F2F meetings, by week 6, the convenience of this e-Learning experience was now being recognized:

> I miss F2F contact, but know I can seek that out for myself with my triad members. The only problem is that now that I am in a habit of NOT travelling to campus on a set night each week, it is more of a chore now to set up F2F meetings (tc2).

Learners commented favourably on the ease of submitting assignments, fewer transportation issues, cost savings, and increased flexibility. Persistence of the online dialogue was also an advantage to many. For some learners there was no sense of a trade-off in taking this course online rather than F2F. They were enthused about this course and enjoyed the learning experience wholeheartedly, as this comment illustrates:

> I loved the online format. It gave me the flexibility I needed, but the course was structured enough to support me in writing my paper. I'm an independent learner and was able to access support whenever required from my triad, the TA, or the instructor (e-V).

In the interviews several learners commented on the efficiency of this e-Learning experience. P. notes that the convenience aspect would *not* have been a benefit if the course had not been so well organized and efficient:

> I think if anything I gained more from this course because you aren't saddled down in those three hour classes where a lot of them you don't get anything out of . . . It was all in the organization. If it was haphazardly organized, we'd have been in big trouble (Interview).

For others, the convenience, novelty, and opportunity to experience e-Learning firsthand made this experience palatable. There was a sense of giving up the familiar comforts of the F2F classroom routine, but also a feeling that they gained much more than they gave up. For example: "I am thoroughly enjoying this experience. The convenience far outweighs any drawbacks. The technology works when I need it and I'm not running into any technical difficulties" (tc2). But for a few, this e-Learning experience did not work for them as the trade-offs and compromises were too great. M. shares: "My confidence has been challenged by the online learning format. There is a definite clash between my learning style and e-Learning" (Posted on Friday, November 01, 2002, 23:56).

Many of the learners reported that they were applying what they learned in their work context, consistent with the expectations of the DDLM. Furthermore, participants were now more versed in the e-Learning medium, valued the firsthand experience, and were now recommending online learning to colleagues. For many learners, a significant benefit was their personal growth. In the final *e-Valuation*, 100 percent of the learners indicated they achieved personal or professional growth. There was a sense of adventure. Perceived as a friendly push to take a risk and try something different, learners felt a sense of accomplishment at the end of the course. For many, this online course was a significant journey, as this posting from J. indicates:

> Early in September . . . as I looked ahead, with trepidation to e-Learning, I wondered if perhaps I had taken on more technology than I could handle . . . I am grateful for the feedback that my fellow classmates and instructors provided . . . I

> gained a great deal from the various courses along the way and e-Learning was the perfect cap to the program(December 02, 2002 20:35).

As the designer and facilitator of this course, Colla also felt a sense of accomplishment and shares, "it's rewarding to know that although it was so much time and effort it wasn't just for this course, materials can be used in other courses" (Interview).

Conclusions

This study highlights the challenges of offering a quality online experience in an organization still shaping an approach to e-Learning. Our findings suggest that the innovation and implementation of sustainable high quality e-Learning courses must be part of a systematic integration of technology into the learning processes of the university; a challenge in a traditional F2F program. As learners shared the challenges and successes of participating in this e-Learning experience, insights into the characteristics of an immersive robust e-Learning *culture* emerged. In such a setting, learners choose between different learning media. They are better prepared to participate successfully in a challenging high quality e-Learning experience because they are introduced to the use of learning technologies and software applications progressively throughout their program, building the requisite technology and learning skills. Along with the option to register online and access to other university support services online, learners have 24 x 7 access to reliable technical help. Such an e-Learning culture is characterized by a true integration of delivery partners: (a) technical support and administrative staff; (b) e-Learning design and facilitation teams; and (c) decision makers who determine resource allocation and media. As this study illustrates, quality e-Learning comes with a cost: significant investments in time and energy. For sustainable quality e-Learning programs, this investment must be acknowledged and supported. McLachlan-Smith and Gunn (2001) state that securing resources is "an ongoing concern in a university not used to the 'front end' resource implications" of e-Learning (p. 43).

Designing a quality e-Learning course is a complex process. Perceptions of quality in this course seemed to be strongly linked to: (a) a fit between the content and design of this e-Learning experience and the learners' needs, wants, and perceived competence; (b) ability to accomplish meaningful outcomes, including enhanced computer literacy – which Dewey (1938/1970) refers to as *collateral learning*; (c) overall learning efficiency; and (d) the quality of feedback from the e-moderator.

Furthermore, this study highlights that all five dimensions of the DDLM (structure, content, delivery, service, and outcomes) are intertwined throughout the design, delivery, and evaluation of an e-Learning course. It is the collective impact of these dimensions that leads to a cohesive e-Learning experience. Rovai (2003) suggests that since online programs consist of several components, such as the "e-Learning software, academic and technical support, presentation of content, and interaction, evaluators must recognize that all components of the program must work together in an efficient manner if the entire system is to be effective" (p. 113). The findings of this study go one step further by suggesting that there is more to designing and implementing a quality e-Learning experience that just understanding the key components. Process emerges as a key factor that links these components into a responsive and relevant situational learning experience. Given resource requirements and the degree of collaboration required to deliver a quality e-Learning event, a professional approach to instructional design and project management is essential.

Built on learning research, theory, and practice, the DDLM served as a framework to guide the design and delivery of a quality e-Learning experience. Evaluating the success of this online course based on the five dimensions outlined in the DDLM provided constructive feedback to the design and facilitation teams that can be used to improve future deliveries. Using the DDLM to evaluate perceptions of quality by key stakeholders has also led to insights on the model itself, which may be useful for researchers in this area.

First, although the model emphasizes the importance of collaboration and interactivity, it could be more robust by integrating the concept of community. Even though creating a supportive learning community was challenging in this course, it is still a relevant element in a quality learning experience and deserves further exploration and experimentation. Faced with similar findings, Song et al. (2004) argue that because community continues to be an issue, more research is needed. It seems there is a need to work with learners to assist them with establishing community or at least, feelings of connection in online contexts. As O'Connor (1998) notes, researchers are grappling with the tension between the collective and the individual. Perhaps socio-cultural theories and perspectives will provide additional theoretical insights.

Second, the structure dimension of the DDLM emphasizes the importance of understanding learners' needs and motivations. Findings from this study suggest that more attention must be paid to the sense of confidence and perceived level of competence that seems to influence the decisions participants make about if, and how, they will engage in an e-Learning course. Technology competence, however, is not only the ability to master the interface. Ability to use supporting applications (i.e., Word or PowerPoint), troubleshoot system problems, and self-assess e-Learning requisite skills is important. More precise articulation and separation of the Web interface from the supporting software applications in the survey questions (i.e., the e-Valuation) would provide more accurate data.

Lastly, MacDonald et al. (2001) suggest that the DDLM is "not a list of required ingredients of success; rather it is a recipe whereby any WBL program can succeed" (p. 27). To continue to improve the recipe, the model could feature more specific guidelines on how to design and deliver a quality e-Learning experience; this may enable more deliberate application of strategies that lead to a quality e-Learning experience. For example, this study reflected the ongoing nature of the design process; it didn't end once the course started. Moreover, design *is* intertwined with facilitation strategies. As suggested by the participants in this study, designing an e-Learning course that lends itself to rapid re-design as learners' needs become better articulated is characteristic of a quality e-Learning experience. Facilitation strategies that enable instructors to adjust the course design *in situ* may be useful to incorporate into the model.

The amount of anxiety *M*. experienced throughout the course is both disturbing and perplexing. It is disturbing as *M.* choose to keep her frustrations to herself. Had this become more apparent to the instructors, it is possible that additional support could have been provided which might have relieved some of her stress. *M's* experience invites further research into what prevents learners from reaching out for help when they find themselves in an online course that does not seem to suit their learning style and whether it is possible to turnaround a negative e-Learning experience. Alternatively, perhaps we have to resolve our thinking to the fact that e-Learning may not for everyone. This study also suggests other areas for research, such as: (a) including other stakeholders as study participants (e.g., administrative and e-Learning support staff as well as university leaders) to wrestle with how to create an integrated network of delivery partners; (b) exploring what kinds of interactivity are really valued by the learners so that they are able to connect with others and engage in more effective learning experiences; and (c) investigating how

to move stakeholders (learners, designers, and facilitators) past the first hurdles quickly so that they feel confident and competent.

The flexibility of the DDLM to guide both the design and evaluation of an e-Learning experience illustrates the dynamic intersections between theory and best practices. As Vogel (2000) explains, "[when] theoretical frameworks inform actions, and actions modify theories so that future actions grow out of what we have learned by experience and reflection, the entire system is energized" (p. 25). As researchers continue to build frameworks based on theory and reflection of practical experiences, the resulting insights will enable all stakeholders in an online experience to make more informed decisions to positively impact the quality of e-Learning. This study is one step in helping to build a broad base of theoretical knowledge informed by practical experiences.

References

Alexander, S. (2001). E-learning developments and experiences. *Education + Training, 43*(4/5), 240 – 248.

Arbaugh, J. B. (2000). Virtual classroom characteristics and student satisfaction with Internet-based MBA courses. *Journal of Management Education, 24*(1), 32 – 54.

Barab, S. A., and Duffy, T. M. (2000). From practice fields to communities of practice. In D. H. Jonassen and S. M. Land (Eds.) *Theoretical Foundations of Learning Environments* (25-54). Mahwah, NJ.: Lawrence Erlbaum.

Benson, A. (2003). Dimensions of quality in online degree programs. *The American Journal of Distance Education, 17*(3), 145 – 159.

Bichelmeyer, B. A., Misanchuk, M., and Malopinsky, L. (2001). Adapting a Master's Degree Course to the Web: A case analysis. *The Quarterly Review of Distance Education, 2*(1), 49 – 58.

Breithaupt, K., and MacDonald, C. J. (2003). Quality Standards for e-Learning: Cross validation study of the Demand Driven Learning Model (DDLM), *Testing International, 13*(1), 8 – 12.

Carr, C. S., and Carr, A. M. (2000). Instructional Design in Distance Education (IDDE): A web-based performance support system for educators and designers. *The Quarterly Review of Distance Education, 1*(4), 317 – 325.

Carstens, R. W., and Worsfold, V. L. (2000). Epilogue: A cautionary note about online classrooms. In R. E. Weiss, D. S. Knowlton, and B.W. Speck (Eds.) *Principles of Effective Teaching in the Online Classroom*, No. 84 (83-87). San Francisco: Jossey-Bass.

Charmaz, K., and Mitchell Jr., R. G. (1997). The Myth of Silent Authorship: Self, substance, and style in ethnographic writing. In R. Hertz (Ed.) *Reflexivity and voice* (193-215). Thousand Oaks, CA.: Sage Publications.

Conrad, D. L. (2002). Engagement, Excitement, Anxiety, and Fear: Learners' experiences of starting an online course. *The American Journal of Distance Education, 16*(4), 205 – 226.

Creswell, J. W. (1998). *Qualitative Inquiry and Research Design: Choosing among five traditions.* Thousand Oaks, CA.: Sage.

Daniel, J. S. (1996). *Mega-Universities and Knowledge Media: Technology strategies for higher education.* London: Kogan Page.

Daugherty, M., and Funke, B. L. (1998). University faculty and student perceptions of web-based instruction. *Journal of Distance Education, 13(*1), 21 – 39.

DeBard, R., and Guidera, S. (2000). Adapting asynchronous communication to meet the seven principles of effective teaching. *Journal of Educational Technology Systems, 28*(3), 219 – 230.

Denzin, N. K., and Lincoln, Y. S. (2000). The discipline and practice of qualitative research. In N. K. Denzin and Y. S. Lincoln (Eds.) *Handbook of qualitative research* (1-28). Thousand Oaks, CA.: Sage.

Dewey, J. (1970). *Experience and Education*. New York: Collier-MacMillan Canada. (Original work published in 1938).

Dick, W. (1996). The Dick and Carey Model: Will it survive the decade? *Educational Technology Research and Development, 44*(3), 55 – 63.

Duderstadt, J. J. (1999). Can colleges and universities survive in the information age? In R. N. Katz (Ed.) *Dancing with the devil: Information technology and the new competition in higher education* (1-25). San Francisco: Jossey-Bass.

Fenwick, T. J. (2000). Expanding Conceptions of Experiential Learning: A review of the five contemporary perspectives on cognition. *Adult Education Quarterly, 50*(4), 243 – 272.

Furnell, S., Evans, M., and Bailey, P. (2000). The Promise of Online Distance Learning: Addressing academic and institutional concerns. *The Quarterly Review of Distance Education, 1*(4), 281 – 291.

Hammond, M. (2000). Communication Within Online Forums: The opportunities, the constraints and the value of a communicative approach. *Computers and Education, 35*(4), 251 – 262.

Howell, S. L., Saba, F., Lindsay, N. K., and Williams, P. B. (2004). Seven Strategies for Enabling Faculty Success in Distance Education. *The Internet and Higher Education, 7*(1), 33 – 49.

Hung, D. W. L., and Chen, D. T. (2001). Situated Cognition, Vygotskian Thought and Learning from the Communities of Practice Perspective: Implications for the design of Web-based e-learning. *Education Media International, 38*(1), 3 – 12.

Jonassen, D. H. (1991). Objectivism versus Constructivism: Do we need a new philosophical paradigm? *Educational Technology Research and Development, 39*(3), 5 – 14.

Jonassen, D. H. (1994). Thinking Technology: Toward a constructivist design model. *Educational Technology, 34*(4), 34 – 37.

Jung, I. (2000). Technology Innovations and the Development of Distance Education: Korean experience. *Open Learning, 15*(3), 217 – 231.

Khan, B. H. (1997). Web-based Instruction (WBI): What is it and why is it? In B. H. Khan (Ed.) *Web-based Instruction* (5-18). Englewood Cliffs, NJ: Educational Technology Publications.

Khan, B. H. (2001). A Framework for Web-based Learning. In B.H. Khan (Ed.) *Web-based Training* (75-98). Englewood Cliffs, NJ: Educational Technology Publications.

Levy, P. (2003). A Methodological Framework for Practice-based Research in Networked Learning. *Instructional Science, 31*(1-2), 87 – 109.

Lockyer, L., Patterson, J., and Harper, B. (1999). Measuring Effectiveness of Health Education in a Web-based Learning Environment: A preliminary report. *Higher Education Research and Development, 18*(2), 233 – 246.

MacDonald, C. J., Breithaupt, K., Stodel, E., Farres, L., and Gabriel, M. A. (2002). Evaluation of Web-based Educational Programs: A pilot study of the Demand-Driven Learning Model. *International Journal of Testing , 2*(1), 35 – 61.

MacDonald, C. J., Stodel, E., Farres, L., Breithaupt, K., and Gabriel, M. A. (2001). The Demand Driven Learning Model: A framework for Web-based learning. *The Internet and Higher Education, 1*(4), 9 – 30.

Macdonald, J. (2003). Assessing Online Collaborative Learning: Process and product. *Computers and Education, 40*(4), 377 – 391.

Mann, S. J. (2003). A personal Inquiry into an experience of adult learning online. *Instructional Science, 31*(1-2), 111 – 125.

Marquardt, M. J., and Kearsley, G. (1998). *Technology-Based Learning*. Boca Raton, FL.: St. Lucie Press.

McElhinney, J. H., and Nasseh, B. (1999). Technical and pedagogical challenges faced by faculty and students in computer-based distance education in higher education in Indiana. *Journal of Educational Technology Systems, 27*(4), 349 – 359.

McGorry, S. Y. (2003). Measuring quality in online programs. *The Internet and Higher Education, 6*(2), 159 – 177.

McLachlan-Smith, C., and Gunn, C. (2001). Promoting innovation and change in a 'traditional' university setting. In F. Lockwood, and A. Gooley (Eds.) *Innovation in Open and Distance Learning: Successful development of online and Web-based learning* (38-50). London: Kogan Page.

McLoughlin, C., and Oliver, R. (1998). Maximising the language and learning link in computer learning environments. *British Journal of Educational Technology*, *29*(2), 125 – 136.

Merriam, S. B. (2001). *Qualitative Research and Case Study Applications in Education* San Francisco: Jossey-Bass.

Noble, D. F. (2002). *Digital Diploma Mills: The automation of higher education*. New York: Monthly Review Press.

O'Connor, M. C. (1998). Can we trace the "efficacy of social constructivism"? *Review of Research in Education, 23*, 25 – 71.

Palloff, R. M., and Pratt, K. (2001). *Lessons from the Cyberspace Classroom: The realities of online teaching*. San Francisco: Jossey-Bass.

Phillips, D. C. (1995). The Good, the Bad, and the Ugly: The many faces of constructivism. *Educational Researcher, 24*(7), 5 – 12.

Reeves, T. C., and Reeves, P. M. (1997). Effective dimensions of interactive learning on the World Wide Web. In B. H. Khan (Ed.) *Web-based Instruction* (59-66). Englewood Cliffs, NJ.: Educational Technology Publications.

Rheingold, H. (2000). *The Virtual Community: Homesteading on the electronic frontier*. Cambridge, MA.: The MIT Press.

Robinson, B. (2001). Innovation in Open and Distance Learning: Some lessons from experience and research. In F. Lockwood, and A. Gooley (Eds.) *Innovation in Open and Distance Learning: Successful development of online and Web-based learning*. (15-26). London: Kogan Page.

Rovai, A. P. (2003). A practical framework for evaluating online distance education programs. *The Internet and Higher Education, 6*(2), 109 – 124.

Salmon, G. (2000). *e-Moderating: The key to teaching and learning online*. London: Kogan Page.

Schwandt, T. A. (2000). Three Epistemological Stances for Qualitative Inquiry: Interpretivism, hermeneutics, and social constructionism. In N. K. Denzin and Y. S. Lincoln (Eds.) *Handbook of qualitative research* (189-213). Thousand Oaks, CA.: Sage.

Song, L., Singleton, E. S., Hill, J. R., and Koh, M. H. (2004). Improving Online Learning: Student perceptions of useful and challenging characteristics. *The Internet and Higher Education, 7*(1), 59 – 70.

Speck, B. W. (2000). The Academy, Online Classes, and the Breach in Ethics. In R. E. Weiss, D. S. Knowlton, and B. W. Speck (Eds.) *Principles of Effective Teaching in the Online Classroom*, No. 84 (73-81). San Francisco: Jossey-Bass.

Stake, R. E. (1995). *The Art of Case Study Research.* Thousand Oaks, CA.: Sage.

Stake, R. E. (2000). Case Studies. In N. K. Denzin and Y. S. Lincoln (Eds.) *Handbook of Qualitative Research* (435-454). Thousand Oaks, CA.: Sage.

Thomas, A. M. (1993). The New World of Continuing Education. In T. Barer-Stein, and J.A Draper (Eds.) *The Craft of Teaching Adults*, (21-38). Toronto: Culture Concepts.

Thompson, T. L. (2003). *Even a Virtual Synchronous Classroom has Walls: There's more to collective meaning making than the technology*. Unpublished master's thesis. University of Ottawa, Canada.

Vogel, L. J. (2000). Reckoning with the Spiritual Lives of Adult Educators. In L. M. English and M. A. Gillen (Eds.) *Addressing the Spiritual Dimensions of Adult Learning: What educators can do*, No. 85 (17-27). San Francisco: Jossey-Bass.

Vonderwell, S. (2003). An Examination of Asynchronous Communication Experiences and Perspectives of Students in an Online Course: A case study. *The Internet and Higher Education, 6(*1), 77 – 90.

Vygotsky, L. S. (1978). *Mind in Society: The development of higher psychological processes*. In M. Cole, V. J. Steiner, S. Scribner, and E. Souberman (Eds.) Cambridge, MA.: Harvard University Press.

Wenger, E. (1998). *Communities of Practice: Learning, meaning, and identity*. Cambridge, UK.: Cambridge University Press.

Willis, J. (2000). The Maturing of Constructivist Instructional Design: Some basic principles that can guide practice. *Educational Technology, 40*(1), 5 – 16.

Wolcott, H. F. (1990). *Writing up Qualitative Research*. Newbury Park, CA.: Sage.

Wolcott, H. F. (1994). *Transforming Qualitative Data: Description, analysis, and interpretation*. Thousand Oaks, CA.: Sage.

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

Navigating Distance and Traditional Higher Education: Online faculty experiences

Alice G. Yick, **Pam Patrick** and **Amanda Costin**
Capella University
USA

Abstract

The academic culture of higher educational institutions is characterized by specific pedagogical philosophies, assumptions about rewards and incentives, and values about how teaching is delivered. In many academic settings, however, the field of distance education has been viewed as holding marginal status. Consequently, the goal of this qualitative study was to explore faculty members' experiences in a distance education, online university while simultaneously navigating within a traditional environment of higher education. A total of 28 faculty members participated in a threaded, asynchronous discussion board that resembled a focus group. Participants discussed perceptions about online teaching, working in an institution without a traditional tenure system, and the role of research in distance education. Findings indicated that online teaching is still regarded as less credible; however, participants also noted how this perception is gradually changing. Several benchmarks of legitimacy were identified for online universities to adopt in order to be viewed as credible. The issue of tenure still remains highly debated, although some faculty felt that tenure will be less crucial in the future. Finally, recommendations regarding attitudinal shifts within academic circles are described with particular attention to professional practice, program development, and policy decision-making in academia.

Keywords: distance education; online education; online faculty experiences; academia; tenure

Introduction

Advancements in technology have expanded the traditional boundaries of education beyond the brick-and-mortar university or college on a land-based campus. Institutions realize online learning is a market demand. The Sloan Consortium found that during Fall, 2002, 1.6 million students took an online course (Allen and Seaman, 2003). More than three-quarters of all higher education institutions offer at least one online course; and recognizing that the demand will only increase, 67 percent stated that it remains in their future strategic planning (Allen and Seaman, 2003). In spite of the prevalence of online course offerings, many faculty members are still ambivalent about online teaching. They may have accepted the value and legitimacy of online learning, yet not all have embraced this new technological delivery system. This is consistent with other studies that indicate that faculty in traditional institutions are not enthusiastic about participating in distance education (Olcott and Wright, 1995). Distance education still holds a marginal status within a traditional institutional reward system based on tenure and advancing in faculty rank (Wolcott, 1997).

Most research studies have focused on faculty employed at land-based campuses and who teach online courses as part of their academic workload. Satisfaction among adjunct faculty teaching online (i.e., Fredericksen, Pickett, Shea, Pelz, and Swan, 2000; Hartman, Dziuban, and Moskal, 2000) and faculty attitudes toward online teaching (Jones, Lindner, Murphy, and Dooley, 2002; Redline, 2001) have been examined. An extant literature search showed that there are minimal studies about the experiences of faculty members from online universities – with the exception of Ryan, Carlton and Ali's (2004) study about nursing faculty experiences in teaching, communicating with learners, and new pedagogies in distance learning institutions. As online teaching becomes more entrenched, we will witness more studies about the experiences and social perceptions of faculty members in online universities, particularly their experiences as they navigate in an academic climate that is influenced by the values and norms of traditional brick-and-mortar institutions.

This qualitative study gave "voice" to faculty members who have chosen to teach at Capella University, an accredited, for-profit online university. For example, how do their colleagues in traditional institutions perceive their role as online faculty teaching at an online university? Would teaching at an online university adversely affect their opportunities to teaching at a traditional university? What are some of the issues raised about the credibility of distance education? After extrapolating the themes related to these online faculty members' perceptions and experiences, specific practice, program, and policy recommendations will be offered within the context of higher education. Such recommendations are particularly valuable in light of fact that technology continues to rapidly evolve as a means of delivering education and as traditional campuses are moving to incorporate online instruction with traditional face-to-face teaching.

In this article, distance education is a general term referring to:

> Planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, methods of communication by electronic and other technology, as well as special organizational and administrative arrangements (Moore, 1996, Para. 1).

Online distance education refers to curricula delivered solely through the Internet. It does not include blended courses, which encompass both face-to-face interactions and technology. Asynchronous discussions consist of text-based communications carried out on a non-real-time basis that spans different times and locations. Online faculty members are affiliated with an institution that delivers curricula solely through the Internet, while traditional faculty refers to those who teach in a physical classroom on a land-based campus. The term "faculty" will be used primarily to mean instructors who facilitate the online course room, although in distance education, the terms "tutor" and "mentor" have been substituted to reflect the pedagogical philosophy of shifting from teaching to learning (Rogers, 2000). Similarly, the term "learner" refers to students and is used in place of the term "student" reflecting again the philosophy learning-centeredness in distance education.

Literature Review

To understand the social realities and experiences of online faculty members, we have to recognize the interplay of factors, including prevailing attitudes among faculty and administrators about distance education, and the current and historical climate and philosophy about distance education. This is embedded within a culture of institutional values and assumptions, as well as a traditional tenure/ reward system found in higher education.

Pedagogy of distance education

The pedagogy of online learning is in contrast with that in brick-and-mortar institutions. Online teaching revolves around the learner, shifting being teacher-centered to learner-centered, which emphasizes that learners possess a wealth of knowledge where the teacher is not the only repository of information (Markel, 1999). The term "mentor" is applied to the faculty to capture the flavor of the new relationship between learner and teacher – more collaborative and less hierarchical (Markel, 1999). The new role of the faculty is to facilitate learning (Beaudoin, 1990).

Faculty perceptions toward distance education are mixed at best. Overall, faculty members appear reluctant to participate in distance education (Olcott and Wright, 1995). There is a perceptual disparity in academia that distance education is second best (Giannoni and Tesone, 2003). Others voice concern about the ability to reliably track learner's progress at a distance (Folkers, 2005). Other faculty wonder about any changes to already busy faculty workloads since distance education is time consuming (Ellis, 2000). Questions about the rewards associated with adopting distance education as part of the faculty teaching repertoire also are of concern (Folkers, 2005). It is possible that as distance education becomes more embedded in the culture of higher education, faculty perceptions will change? In a more recent large scale survey study by Berge (2002), employees in corporate settings who use distance technology for training, perceived barriers is also a function of the level of perceived maturity of the organization in using distance education. In other words, different perceived barriers exist during different stages of the implementation and maturation of technology within an organizational context. For example, the barriers of technical difficulties and support and organization culture and change become less burdensome when distance education becomes institutionalized or integrated in an educational institution's delivery structure.

Infrastructure of distance education and unbundling faculty functions

The infrastructure of distance education shifts from a campus-centric model to a consumer-centric model since learners become less reliant on an academic infrastructure based on human mediation. With distance education, learners now can obtain services more quickly through automated systems (Beaudoin, 1998). Ultimately, options increase for learners, and this transitions them to the role of consumers. Therefore, curricula must reflect learners' needs, and learners determine the location for learning, the time when they want to learn, and the pace of learning (Evans and Fan, 2002).

Since it was first introduced in the mid-1970s, the concept of unbundling faculty roles has resurfaced. Unbundling refers to the process of assigning costs associated with delivering distinct components of instruction (Paulson, 2002). Typically, in traditional institutions, faculty teach, conduct research, advise, and perform service within the parameters of a physical setting dedicated to those purposes. The faculty member develops and teaches the instructional units, thereby reflecting one individual's intellect (Sumler, 2004). In distance education, however, "unbundling" breaks up these activities, and each activity is assigned to a number of professionals including instructional designers, adjunct faculty, and technologists (Academic Leader, 2004).

Institutional culture of rewards

The reward structure in distance education environments is also distinctly different. Traditionally, tenure is one of the ways faculty members are rewarded. It is estimated that 90 percent of all four-year higher education institutions and 99 percent of public universities in the United States have a tenure track system (Brown, 1999). Tenure was originally designed in the early 20 th century to

protect professors who teach and write about controversial topics from fear of losing their positions (Chronicle of Higher Education, 2000; Lataif, 1998). It is based upon Western values promoting free inquiry, with the notion that if empirical inquiry was in any way constrained, then society will stagnate (Tierney, 1998). Many argue, however, that tenure provides lifetime employment without promoting quality work (No Author, 2000) and can discourage faculty experimentation with new technologies. The risk that this poses to the institution is that junior faculty who are not yet tenured will only want to devote themselves to activities leading to tenure.

Perceived institutional priorities traditionally shape faculty behaviors. Despite the expectation that teaching, research, and service are equally emphasized, faculty working in research universities perceive research and scholarship as highly valued (Wolcott, 1997). Although many administrators and faculty acknowledge that standards for tenure are often nebulous and will often times produce unhappy and anxious faculty, the universal goal is to obtain tenure (No Author, 2000). It is within this climate that we can better understand faculty members' attitudes toward distance education and the use of innovative technologies in delivering education.

Wolcott (1997) looked at faculty reward systems and how distance teaching is valued and rewarded within a culture of tenure. What Wolcott found was that the institutional reward system shapes decisions about participation in distance education activities. Faculty and administrators do not attach the same amount of prestige to distance education as with other activities such as research and scholarship. Wolcott found that many promotion and tenure documents do not mention distance education as activities for which faculty should receive "credit" toward achieving tenure. When distance education is counted, it is merely credited as teaching despite the contention that it involves greater time commitment and work. When counted as service, it is weighted less toward promotion and tenure (Wolcott, 1997).

These concerns are also reflected in Wolcott and Bett's (1999) qualitative study with 32 faculty members. Many noted that teaching via distance education involves much "hidden" work such as helping learners adapt to new technologies and creating extensive amounts of course materials, academic activities not recognized by tenure decision makers. Participants wrestled with viewing distance education as part of the teaching load or whether it should be treated as an overload – i.e., treated as "above and beyond" a regular teaching assignment. Those who decide to participate in distance education do so because they desire to grow professionally, and they recognize it fits within their professional values. This same issue of workload and time investment was noted in Rockwell, Schauer, Fritz, and Marx's (2000) qualitative interviews with administrators. Faculty were concerned about not receiving credit for incorporating distance education into the teaching workload.

Ellis' (2000) qualitative study explored the challenges encountered when full-time faculty members at the Pennsylvania State University World Campus, a large public institution, taught distance education courses. The majority of administrators and faculty indicated that release time is the major barrier to faculty participation in distance education. Release time is needed so that faculty can replace teaching on-campus courses with developing and/ or teaching distance education courses. Again, the time factor would detract from activities that affect promotion and tenure.

Traditional ways of managing the academic process cannot be directly applied to distance education institutions, such as online universities. As the for-profit sector increases its participation in distance education, it has not adopted traditional academia's taken-for-granted assumptions about tenure, administrative infrastructures, faculty roles, and pedagogy. Online faculty members' experiences therefore are influenced by both the climate in distance education as well as traditional institutions.

Methodology

Research design and context

This study utilized a qualitative research design, specifically, an asynchronous online threaded discussion board focus group. The use of discussion boards as virtual focus groups has become increasingly popular (Moloney, Dietrick, Strickland, and Myerburg, 2003). Virtual focus groups enhance participation because of convenience, particularly for this study where faculty participants were geographically dispersed.

The study was conducted with online faculty, including both core faculty (full-time) and adjunct faculty from the School of Human Services at Capella University. Capella University is a for-profit, accredited online university that offers strictly online courses.[1] . The School of Human Services is made up of diverse program areas: General Human Services; Criminal Justice; Healthcare Administration; Management of Non-Profit Agencies; Mental Health Counseling; Marital, Couple, and Family Counseling/ Therapy; Counseling Studies, and Social Work and Community Services. The university operates within a quarter system, in which learners take asynchronous online coursework to complete MS and PhD degrees. It does not adhere to the traditional tenure track system, and faculty performance is reviewed annually by the Program Area Chairs for each curriculum.

During the 2003 academic year when this study was conducted, there were 58 faculty members who were either adjunct or core faculty members in the School of Human Services. The majority (n = 43) were adjunct faculty, teaching two to four online courses a quarter on a part-time basis and advising a limited number of Masters and PhD learners. Adjunct faculty are often practitioners in their respective disciplines, and some also hold faculty appointments at traditional brick-and-mortar universities. There were 15 core faculty members, who are full-time and teach a maximum of two-to-three online courses a quarter, advise both Masters and PhD level learners, serve on committees, and perform other academic duties linked to the School of Human Services.

Sampling Design and Profile of Sample

A convenience sample was recruited from the faculty (minus the three researchers, all core faculty). An email was sent describing the study and soliciting participation, and the final sample consisted of 28 faculty members, representing 50 percent of the School of Human Services faculty. Slightly more adjunct faculty (n = 18) participated in the study than did core (full time faculty). The gender composition was evenly divided; however, there was noteworthy diversity in age, ranging from 31 to 69 years of age, with the average age of 51 years. Faculty represented diverse program areas; however, more participants received their terminal degree from a traditional university. All participants received their PhDs from regionally accredited institutions. Faculty participants were relatively new to the university, with the median time teaching at 1.5 years and a range of two months up to six years. The majority were practitioners and many worked as adjuncts in other traditional universities. Many participants had no previous online teaching experience. Table 1 summarizes the demographic and social profile of the sample.

Table 1. Demographic Profile of Participants (*n* = 28)

	N	%
Gender		
Male	13	46
Female	15	54
Affiliation		
Adjunct	18	64
Core	10	36
Program Areas		
Administration and Management*	7	25
Counselor Education**	11	39
Social Services***	10	36
Type of Institution of Terminal Degree		
Traditional University	19	68
Non-Traditional University	9	32
Previous Online Teaching Experience		
Yes	9	32
No	19	68

*Administration and Management comprises of both Health Care Administration and Management of Non-Profit Agencies)
**Counselor Education consists Mental Health Counseling and Marital, Couple, and Family Counseling/ Therapy
***Social Services include Criminal Justice, and Social Work and Community Services

Data Collection and Analysis

The study was approved by the university's Institutional Review Board. An online discussion board was set up and was active for a three-week period, and the three researchers took turns facilitating it. Each week, new discussion questions were posted, and all participants were encouraged to dialogue with one another, with the researchers moderating and facilitating the discussion. All participants were encouraged to revisit the previous week's discussion in order to continue conversations started during that period. The following questions were posted for faculty discussion:

1) How do you think your colleagues in traditional academia perceive your work teaching for an online university?

2) Do you think your work with an online University would help or hinder you if you decided to teach on the tenure track at a traditional university? Why or why not?

The following questions were posted as a result of recurrent discussion in the area of tenure and the role of research:

3) What types of reactions have you received about Capella University not having a "tenure" track?

4) What do you think faculty can do to begin building this research focus?

At the end of the study, participants completed a close-ended survey that consisted of demographic questions. All the discussion postings were downloaded, and content analysis was conducted to extrapolate recurrent themes.

Findings

Perceptions of online teaching

Participants were asked what their colleagues from traditional brick and mortar institutions thought about their teaching at an online university. Reactions were mixed. Negative reactions directed towards distance education still exist seemingly based on the notion that distance education is not credible or equivalent to traditional classroom education. As one faculty participant stated, it is a quality control issue since some traditional faculty still perceive that online education is "diluting the quality of higher education."

> For faculty not involved in this style of learning, many still do not believe it has equal value. (E.R.)
>
> My tradition-bound colleagues do not believe that the online university can 'do the job.' (K.Z.)

During this discussion about the perceived lack of credibility, one of the researchers posted: "Where is it ('the less credibility') coming from? What makes it 'less credible'?" Participants felt that much of the criticisms about distance education stemmed from lack of understanding, knowledge, and information about distance education – all of which can elicit fear. Without adequate knowledge, it is easy to attribute and perpetuate negative stereotypes about distance education. It is not easy, however, to completely understand the impact of online teaching until a faculty member actually employs the technology and then becomes a "convert."

> I think there is a fear factor involved – people criticizing that which they do not understand. For example, remember when University of Phoenix, National, Chapman, and many of the other night MBA programs began? They were deemed to be 'less serious (read less rigorous) programs, and therefore, the degrees were considered to be somehow not as good as those from a big name university with a traditional program. Now those degrees are respected (for the most part). (S.T.)
>
> It has been my experience that those who think this way have not really taken the time to look at all the types of online instruction. Rather these people have seen the worst of the courses and then equate online delivery with correspondence school material. The only converts that I have run into are those who have been forced to teach/ create a class. When one finds how well the students perform (the knowledge that is gained) s/he becomes a convert (R.A).

Furthermore, a sense of elitism pervades many traditional institutions, and ultimately, many faculty fear that technology will precipitate change – change that might affect their jobs. One participant noted with wry amusement about his colleagues' initial reactions about him working in an online university and how this changed when they had to teach an online course.

> Initially [my] colleagues who taught at traditional university were surprised and horrified. . . However, as their universities introduced a few online courses . . .

> hence they would phone me in panic, asking for advice and tips. Their initial responses, from my perspective, amounted to a lack of information and academic 'elitism.' (D.V.)

Finally, distance education still evokes images that harkens back to the "early days correspondence courses and the sheepskin in the mail" (S.T.). It is crucial to contextualize such negative reactions, however. One faculty normalized such negative reactions as being commonplace since technology often challenges the status quo, bringing about anxiety and fear. He noted: " . . . the university where I received my PhD, there has been much resistance to online teaching by faculty members in my department . . . they are most afraid of what will happen to them in terms of their status. Change is sometimes painful."

Technology is never static – it is continually improves, making it more friendly for users. Consequently, prevailing myths and negative attitudes may be shifting as the overall climate and landscape of distance education has begun to change. There also may be something to be said about "safety in numbers." As more traditional, land-based universities adopt technology for the delivery of instruction, online courses are becoming more commonplace. "Commonplace" seems to connote normality and acceptability.

> Two or three years ago, they thought that a distance learning education was Mickey Mouse. Today they are envious and trying to jump in . . . It is interesting that most of the brick and mortar institutions that are now also offering distance learning opportunities for their students and are making online teaching experience a requirement for faculty vacancies. (F.Y.)

> My experience has been that faculty working in traditional settings, along with teaching online, are much more open to distance learning. Many traditional schools now offer distance learning programs/ degrees and see the potential in the adult learning market . . . An interesting development is the use of Blackboard in the traditional classrooms basically utilizing the same functions as an online course. (E.R.)

> Witness the many universities that are now part of Sloan-C conferences – they realize that they need to offer at least some of their programs online in order to remain competitive. (S.T.)

Over time, participants have observed that their colleagues' interests are piqued, and many want to "get their foot in the door" of online teaching. Like the above faculty who noted how some colleagues are asking him for advice, others see similar changes in attitudes.

> Many have been referred to Capella to become faculty because of the intrigue of online teaching. There is something charmingly engaging and enigmatic about being a faculty in an online university. (B.Z.)
> Recently, in the last year or so, the spirit of the inquiries have changed to a different tone when asked 'So how does this work?' to 'Hey, can you put in a good word for me, I'd like to try it. (L.A.)

Measures of credibility and role of research in distance education

Three major "measures" of credibility or legitimization emerged from the data generated by the asynchronous focus group: 1) large student enrollment numbers; 2) accreditation; and 3)

scholarship/ research. First, size counts. Large student enrollment numbers give an aura of credibility to the university. One participant commented: "I taught at X university for many years. The status of bricks-and-mortar with a large enrollment in a city like XXX and satellite campuses adds credibility to the programs." Second, recognized and accepted regional accreditation legitimizes programs and the University. It is a stamp of credibility that is understood by other institutions, academicians, and the general public. Several months prior during this research study, Capella University received news that their Mental Health Counseling program received CACREP (Council on Accreditation of Counseling and Related Educational Programs) accreditation. One faculty participant asserted that "accreditation has gone a long way to improve [our] image." More work on accrediting other program areas is vital, however.

Third, the scholarship of faculty and learners also lends public credibility to the institution. Scholarship encompasses conducting research and the ensuing publications that would follow, bringing recognition to faculty and learners.

> In the circles in which I travel . . . it is expected that all are competent teachers . . . In most instances the thing that is used to separate folks in the credibility ladder is research based publications . . .What I am saying is that it will not matter if one teaches at an online school or a traditional one, professionally, the researchers are given more credibility in the field. Again the view is that the role of the faculty is not simply a teacher in a Ph.D. program, but a generator of new knowledge. (G.R.)

> The faculty were actively encouraged (even as adjuncts) to publish and present, and when they did (which they did often) it was highly publicized, including the link to University Y. In addition, students were actively encouraged to publish course papers that were great and the university helped find a home for a paper when the student was interested. Again the link to University Y was established and the public recognition added validation to the program. Despite our for-profit status, I think we need to establish a stronger link to research, including actively supporting faculty and learners in their possible endeavors. (S.T.)

As the topic moved into scholarship and research, participants were asked to expand on their thoughts regarding the role of research in an online university. Participants felt there are tremendous advantages to conducting research in a distance education institution, particularly one that specializes in online teaching. First, the resources in terms of talent are extensive and diverse. H.I. maintained:

> Capella has the ability to bring in layers of talent from the country. For example, the process of course development involves a number of different layers of talented individuals . . .The same model could be employed to develop a pool of talented grant writers, research assistants, and others who would want to be part of the process.

Second, an online university that taps into populations, not necessarily reached by traditional universities, offers the opportunity for research that includes diverse samples because the learners themselves are from diverse geographic areas, ethnicities, and have diverse and rich life experiences. This also applies to faculty members.

> Faculty living in various areas of the country can develop research proposals that take advantage of the geographical differences – urban/ rural, west/ east, Latino/

> Anglo populations, etc. Making comparisons in this manner adds an important dimension to any project. (H.I.)
>
> What classroom can you walk into that will have learners from a more culturally and ethnically diverse population than ours at Capella? Impossible. From these multi-diverse populations come comments and interactions that can only be generated from this type of environment. This diversity will definitely affect research efforts and outcomes. (Q.B.)

Finally, the opportunity for interdisciplinary and learner/ faculty collaboration is enhanced. Due to the range of program areas in the School of Human Services, scholarship can reflect this extensive and rich multidisciplinary setting. Learner/ faculty collaborations are strengthened because of the diverse interests of learners and faculty from a wide geographic area. Pooling resources through the use of technology can enhance research efforts.

> Interdisciplinary cooperation can be promoted and effectively incorporated into research proposals if made a core value from the start. This can take place between schools as well within schools. I know that at brick and mortar institutions, cooperation between disciplines can be very difficult to foster. In my experience, such cooperation was the exception. (H.I.)
>
> My experience tells me that some of the unique characteristics of Capella's virtual environment when compared to brick-and-mortar settings is that we are actively engaged with a wide variety of learners. The broader involvement should allow us to find learners with similar interests as ours and help us to collaborate with them to conduct further research. The same could probably be said of faculty collaboration. (Q.B.)
>
> I agree that as a virtual faculty we encompass a great variety of backgrounds and similarly have a multi-culturally diverse student population available to sample in research efforts. Just as the research/ practitioner model has been popular in counseling practice, becoming oriented as faculty/ researchers is a mental set that needs to be developed. (L.A.)

All three participants above also reinforced the view that research should not be a tangential activity; rather a "core value" or "mental set" promoted by the university. Conducting research is essential for the faculty working with doctoral learners and for the faculty's professional growth.

> I would see it as critical function of a faculty member in a doctoral program. As I have said many times in this set of discussions, the doctoral faculty member has a job of not only being a teacher but a generator of new knowledge. (G.R.)
>
> Research is fundamental to my growth as an academician and a human being. I employ my sociological imagination to create a variety of research tasks, some may be published and some never see the light of day. The outcome is often less important the process. (H.I.)

The only concern noted about having a research focus in an online university was the creation of a "class system" where those who conduct research are more valued than those who just teach. One faculty expressed: "I suppose that I am more worried about a research emphasis creating a "class system" as it has in other schools. Others mentioned this last week, that the 'less than' perception focuses on research activities, or the lack of them." (D.C.)

Tenure in distance education

Participants were asked if their work in an online university would help or hinder them if they were later to decide to teach at a traditional institution with a tenure track system. The majority of the participants were not concerned about this issue and felt that their current work at an online university only enhances their options. It has given them experiences that other faculty members at traditional universities have often not acquired.

> My full time position is at a traditional university. What I have learned and continue to learn at Capella only enhances my overall vita . . . This relationship has provided me with experiences other faculty members may not be exposed to. (E.R.)

> I don't think being tenured would make any differences. The experience of teaching will be valued. (T.B.)

> I already have experience working in a B&M [bricks-and-mortar] university so this additional experience can only strengthen my position. (L.A.)

Because other universities are now adding a distance learning component, participants felt that their online teaching experiences would only serve as an asset.

> The majority of tenure track institutions are including DL experience as either preferred or requisite for consideration for faculty vacancies. (F.Y.)
> A definite factor in the past. Assume it is becoming less so every day as traditional universities implement their own nontraditional programs. (J.U.)

> I do know that several non-tenured institutions are trying to get their courses online to meet the needs of the community. Experience teaching at an online university would be seen as an asset in this setting. (R.A.)

There were a couple of participants, however, who felt differently. For these faculty members, recognition that there currently is a lack of concerted research activity at online universities, combined with the fact that many traditional brick-and-mortar universities emphasize research activities in their tenure and promotion process, was viewed as holding the potential to hinder such a transition. G.R., for example, felt that his past teaching experience at a traditional university would help him make the transition back: "If I had no previous teaching/ research experience in traditional academia, I think it would seriously limit my chances if I did not have the previous experience."

On the topic of tenure, the facilitator then posed: "Out of curiosity, what type of reactions have you received about Capella not having a tenure track?" Several participants felt that in the future, not having a tenure system will be a more prominent trend in higher education.

> The only reactions I've ever had came from two colleagues at a former brick-and-mortar school who believed that this was probably the wave of the future . . . (H.I.)

> Tenure is one of those concepts that I believe is increasingly outmoded. I have been at the receiving end of poorly done courses that have been taught by a tenured faculty member who has not updated materials or stayed current with

> new thinking in many years. And the university has not way to remove him/ her due to tenure. (S.T.)
>
> If one does not have to offer it then why do it? I also am sure it is the wave of the future to not have tenure track positions. (G.R.)

A concern was expressed regarding not having a tenure system, however. Lack of such a system might stifle academic freedom.

> . . . they all also express concern regarding being replaced if they have a different political or philosophical view than the administration and the potential for loss of academic freedom. (F.Y.)
>
> Well, as a tenured faculty at a traditional university I do find the idea somewhat less desirable. What if I take an academic position that Capella finds it does not like? I have the academic freedom at my traditional university to call into question topics that are politically sensitive and not suffer any recriminations. . . (G.R.)

Finally, several participants expressed the viewpoint that tenure can affect quality of work and productivity in paradoxical ways: It can motivate faculty to higher productivity. G.R. observed: that "many schools are looking for ways to push teachers into being 'highly effective.' Tenure can, and often does, serve this role at most universities." However, it can have the opposite effect as noted by H.I. with respect to the "intractable problem of dead wood and dust collectors dragging down the quality of their department."

Discussion and Implications

The finding of negative attitudes toward distance education, particularly to online learning, is not surprising. Vestiges of the notion that distance education are less rigorous and credible, and more inferior to traditional academia, remain. Society, however, has shifted to a knowledge-based economy that requires that individuals be taught numerous times using a variety of delivery methods. Lifelong learning has become the central tenet in education and training (Klor de Alva, 2000). This may not, however, necessarily translate into a change of attitudes among faculty employed at traditional land-based institutions. Change neither comes easily nor without resistance, and it frequently triggers uncertainties that ultimately evoke fears on a personal level. Folkers (2005) observed this resistance does not merely involve faculty's discomfort with using technology if they are unfamiliar with it; rather, distance education challenges current notions of power and control in higher education. Traditionally faculty have control over the content of the knowledge they distribute, but with distance education, faculty have to collaborate with other staff such as instructional designers over curricula, and administrators have greater scrutiny and supervision over the curricula (Folkers, 2005). Over time, and with the improvements of technology, our faculty participants have noted that distance education is receiving more attention and respect, which is inevitable given the increase of learners taking online courses and evident trends that traditional institutions are incorporating distance learning components (Sloan-C-Resources, 2005).

When viewing how attitudes toward technical innovation change over time, it is essential to recognize that application of technology in educational settings is a dynamic and changing process. Over time, technology improves and is enhanced, becoming more user-friendly. Consequently, prevailing myths and negative attitudes toward distance education will change as

student enrollment increases in distance education and as more faculty members become more informed and comfortable in utilizing the technology. The literature has documented a pedagogical paradigm shift in education (Rogers, 2000) and, indeed, there is an intellectual acceptance of such a paradigm shift. Behavioral transitions, however, only begin when online instructors actually experience this delivery system and implement the new pedagogical philosophy of learning-centeredness. Meanwhile, their colleagues (some whom may be skeptical of online learning) are watching and listening to their experiences regarding how a computer mediated delivery system can be applied to teaching and learning, and how the role of the instructor is altered in the virtual environment. These "vicarious observations" of the hesitant or resistant faculty, where they observe the practices of colleagues who are teaching online, may be key to the process of changing negative attitudes toward distance education. Conversations about the online pedagogy and practice in this informal, collegial context can serve to reduce apprehension about online teaching in general and perhaps, serve to motivate faculty who are used to traditional face-to-face teaching to teach online. Reducing residual stigma about online distance education through this process is a softer, less threatening way to change attitudes about technology innovation in education. Ultimately, dissemination of information reduces fear of innovation although it may take a while for entrenched negative attitudes to completely dissipate.

Another key factor in this debate must be addressed: Online teaching is not suitable to all faculty members who wish to teach. While the pedagogy offers an option for teaching that is intriguing and engaging, these qualities may not be attractive to all campus-based instructors. Particular characteristics of an individual instructor (i.e., the art of teaching) may be more powerfully delivered by some in a face-to-face (FTF) format rather than an online format. Thus, the "best fit" argument is applicable to determining who will teach online and who will remain in the FTF setting. A central tenet of online distance education for learners is that it provides an educational option for those who otherwise would not have access to advanced degrees. The same holds true for the faculty member who wishes to teach, but for various reasons cannot do so from a campus setting.

In essence, there are three mechanisms that may aid in softening negative attitudes toward online teaching. First, administrative leadership in traditional settings may find that faculty resistance to online teaching reflects "best fit" considerations or that embarking on a new pedagogy is simply not appealing. It is essential in such circumstances that teaching assignments to online course development and teaching start with those faculty members who are intrigued and receptive. Based on this study's findings, the "bring along" effect may soften resistance; e.g., innovators receive the first assignments, obtaining appropriate training and support resources. As these pioneers experience success, other faculty may find the online teaching option more appealing.

Second, a faculty-to-faculty mentoring format holds the potential to provide collegial support for the first-time faculty venturing into online teaching. In this format, the experienced online instructor provides guidance and support to a colleague teaching his or her first online course. The mentoring process "transforms" the faculty through learning the specific and unique roles of the virtual instructor. Finally, a third option to soften resistance consists of team teaching. Using this option, administrators would assign two or three instructors to develop and teach their first online courses. Through shared experiences, the team of instructors can observe and learn from each other, encouraging each other to self-reflect about what works and what does not work. Central to the success of these strategies, however, is recognition that online teaching cannot be added on to a full workload of teaching FTF courses. Online teaching is intense, requires use of communication competencies that are different from those in a FTF setting, and therefore, administrative support and training are vital to ensure that these competencies are taught. This level of support ultimately paves the way to faculty success and satisfaction with the technology.

It is important to remember that despite the emergence of many for-profit educational institutions and new paradigms of learning, traditional institutions will not disappear. They have long-standing traditions, which continue to shape public perceptions about credibility and legitimacy. Accreditation and research/ scholarship, for example, will continue to be the benchmarks of validity and legitimacy. More online universities are applying for accreditation, and accrediting bodies find themselves evaluating whether standards that were employed for brick-and-mortar institutions are appropriate for distance education institutions. Accrediting bodies will continue to evaluate quality control issues in regard to the online institutions' mission, faculty, students, curricula, instructional resources and scholarship (Vincent and Ross, 2002).

There is often less discussion about research and scholarship in distance education universities, particularly if they are for-profit institutions where research may be secondary (or absent) in their mission statements (Ruch, 2001). Yet, findings from this study point to the fact that research and scholarship are also the hallmarks to credibility for other academicians and to the outside world of academia, and therefore there is a need for further research within the School. Beyond symbols of legitimization, research and scholarship are still important to online faculty members since that is what they are trained to do and is the essence of who they are as scholars and educators (Ruch, 2001). It is also part of each faculty member's professional growth. For distance education institutions with a doctoral program to espouse to learners that they are to become scholar practitioners means that faculty, too, must model that role. In many ways, emphasis on research and scholarship remains consonant with the learning-centric model. In this study, participants identified the value of interdisciplinary learner/ faculty collaborations. Such collaboration fits in with Beaudoin's (1990) thought about distance learning pedagogy's emphasis on "what students do, not what teachers do"(p. 21).

It is plausible that conceptualisations of research and scholarship need to be reconfigured and redefined in an online environment. Although Edgerton (1993) was not directly addressing distance and online education, he talked about Eugene Rice, a scholar at the Carnegie Foundation, who proposed a reformulation of faculty's roles of not merely fulfilling the standard tasks for teaching, research and service, but of "advancing, synthesizing and integrating, applying, and representing knowledge through teaching" (Edgerton, 1993, p. 13).

Apparent in distance education, particularly in for profit institutions, is the lack of a tenure system. Many participants in our study were not concerned about making the transition back to traditional brick-and-mortar institutions and did not feel that their work at an institution without a tenure track system would impede them in any way. They felt their experiences are unique, and indeed, Ruch's (2001) informal interviews with online/ distance educators at several for-profit institutions found that they enjoyed the lack of pressure of tenure, which gave faculty the opportunity for greater academic freedom and creativity to shape instruction as well as shape academic culture. Yet, because of the notable lack of research and a tenure system at the University, academic publishing becomes a self-initiated activity. As a consequence, the reality is that scholarship is relegated to a lesser priority given the day-to-day demands of teaching and dealing with learner issues. Concerted administrative support and resources are needed to implement mechanisms whereby faculty members are encouraged to pursue and engage in scholarly activities. For example, in an online environment where faculty members are dispersed geographically, isolation from the day-to-day contact with virtual colleagues is typical. In the "distant" educational environment, what are the different levels of faculty support that is needed and is appropriate in order to pursue scholarly activity? One solution would involve administrative leadership and faculty exploring strategies to use the same technologies faculty use to communicate with learners (i.e., video conferencing, teleconferences, etc.) for faculty support groups; e.g., writing groups to promote scholarly writing and publishing.

A discussion about tenure also brings up the issue of academic freedom. A couple of participants expressed the fear that without tenure, academic freedom would be hampered. Ruch's (2001) informal interviews found that academic freedom is now redefined in terms of freedom for innovation and creativity. Perhaps, in the shaping of a new academic culture, the definition of academic freedom will be expanded to include freedom in personal areas, which ultimately has positive influences on creativity. To be sure, administrators and chairs in online universities will need to incorporate new faculty development and ideas about sabbaticals to promote such academic freedoms. Will these "virtual" sabbaticals take the traditional form or will they be creatively defined in a different paradigm?

On the other hand, for some there is a concern that without tenure, productivity is decreased – i.e., a non-tenure system is a disincentive for academic activity. A counter to this argument focuses on a different set of "drivers" for performance: a stimulating, creative environment with a promising incentive structure and collegial spirit of innovation fostering high quality work (Ruch, 2001). Distance education and online universities, therefore, may have to reconceptualize new incentive structures to promote quality standards as well as encourage continued professional growth.

In general, there is the feeling that tenure is an outdated concept and that not having tenure track systems in higher education will be an increasing trend. According to Klor de Alva (2000), a 1998 poll of 50 state governors ("Transforming Post-Secondary Education for the 21 st Century") found that there was a gap between the goals of traditional higher education and society. Specifically, the least important item judged was maintaining traditional faculty roles and tenure.

Limitations of the Study and Directions for Future Research

This research study represents a launching pad for more empirical work to be done in the area of remaking the academy, as described by Klor de Alva (2000). The process now impacting higher education has affected the perceptions and experiences of online faculty as they continue to navigate an academic culture that is influenced by norms of traditional institutions of higher education. This current research study was limited by a sample that represented only one school; specifically, the School of Human Services at the University. It would have been helpful to determine if similar experiences and realities are shared by other online core and adjunct faculty members throughout the other schools at the University (i.e., Psychology, Business, Technology, etc.) who may have different cultures and core values associated with their professional disciplines. A sample comprised solely of online faculty members is also biased or skewed, since information obtained about perceptions are from faculty who have made professional decisions to seek opportunities to use a new delivery system for education. A study comprised of both online faculty and faculty from traditional land-based institutions who use only face-to-face instruction could have yielded rich data comparing and contrasting their perceptions about distance and online education and tenure.

Future research studies need to continue exploring the dynamics of the seemingly volatile issues that technology can bring in higher education; that is, the interaction of how technology challenges traditional notions of how knowledge is disseminated, who owns knowledge, power struggles over limited resources, and the reconfiguration of previously entrenched structures (Shedletsky and Aitken, 2001). Where specifically in higher education do issues of cognitive dissonance exist that seemly exacerbate the difficulties with online and traditional instruction? How can both delivery systems function alongside, complementing each other's strengths and limitations? How can a "bring along" effect be used strategically by higher education institutions to increase faculty comfort levels using the collaborative strategies discussed? These and other issues represent rich areas for further investigation.

The role of research and scholarship in online academia need to be explored in greater depth. Already scholars are debating the validity of online scholarship; for example, online refereed journals are deemed to be less credible (Shedletsky and Aitken, 2001). The prevalent notion is that anyone can create a website and place a document on the Internet for public consumption, and therefore, online scholarship is of lower quality ((Shedletsky and Aitken, 2001). Perhaps new conceptualizations of scholarship need to be examined. What are these new definitions as perceived by faculty and administrators? How do scholars ensure high standards given the rapid pace of information dissemination? How will scholarship be morphed or altered when educators become more involved in online education? Does the ancient paradigm of scholarship need to change with the changing delivery systems offered by computer technology? Questions about scholarship and research in the online environment of higher education can serve as the scaffolding for such a challenging exploration into uncharted territory. Based on the findings of this study, one outcome emerging from the data is certain: The landscape of education is dynamic and ever-evolving. It is currently infused with newness – new technological delivery systems, new concepts about learning, new roles of faculty and administrators, and new ways of teaching. How faculty and administrative leadership capitalize on these expanding opportunities will choreograph much of the future of higher education that embraces the technological revolution.

References

No Author (2004). Seven Faculty Distance Ed Trends. *Academic Leader, 20*(2), 7.

No Author (2000). The impact of incentive systems on faculty behaviors. *Change, 32*(2), 53 – 57.

Allen, E., and Seaman, J. (2003). Sizing the Opportunity: The quality and extent of online education in the United States 2002 and 2003. *Sloan-C.* Retrieved on April 10, 2004 from: http://www.sloan-c.org/resources/sizing_opportunity.pdf

Beaudoin, M. F. (1998). A new professoriate for the new millennium. DEOSNEWS, 8(5). Retrieved on April 12, 2004 from: http://www.ed.psu.edu/acsde/deos/deosnews/deosnews8_5.asp

Beaudoin, M. R. (1990). The instructor's changing role in distance education. *The American Journal of Distance Education, 4*(2), 21 – 29.

Berge, Z. L. (2002). Obstacles to distance training and education in corporate organizations. *Journal of Workplace Learning, 14*(5/6), 182 – 190.

Brown, R. Q. (1999). Salaries and tenure of fulltime instructional faculty on 9- and 10-month contracts. *U.S. Department of Education Publications*, 425 – 682.

Chronicle of Higher Education (2000). Tenure and labor relations in academe. Retrieved April 12, 2005 from: http://www.chronicle.com/indepth/labor/aaup/htm

Edgerton, R. (1993). The re-examination of faculty priorities. *Change, 25*(4), 10 – 25.

Ellis, E. M. (2000). Faculty participation in the Pennsylvania State University World Campus: Identifying barriers to success. *Open Learning, 15*(3), 233 – 242.

Evans, C., and Fan, J. P. (2002). Lifelong learning through the Virtual University. *Campus-Wide Information Systems, 19*(4), 127 – 135.

Folkers, D. A. (2005). Competing in the Marketplace: Incorporating online education into higher education – an organizational perspective. *Information Resources Management Journal*, *18*(1), 61 – 77.

Fredericksen, E., Pickett, A., Shea, P., Pelz, W., and Swan, K. (2000). Factors influencing faculty satisfaction with asynchronous teaching and learning in the SUNY learning network. *Journal of Asynchronous Learning Networks, 4*(3). Retrieved August 23, 2003 from: http://www.aln.org/publications/jaln/v4n3/index.asp

Giannoni, D. L., and Tesone, D. V. (2003). What academic administrators should know to attract senior level faculty members to online learning environments. *Online Journal of Distance Learning Administration, 6*(1). Retrieved April 16, 2004 from: http://www.westga.edu/~distance/ojdla/spring61/giannoni61.htm

Hartman ,J., Dziuban, C., and Moskal, P. (2000). Faculty Satisfaction in ALNs: A dependent or independent variable. *Journal of Asynchronous Learning Networks, 4*(3). Retrieved August 23, 2003 from: http://www.aln.org/publications/jaln/v4n3/index.asp

Jones, E. T., Lindner, J. R., Murphy, T. H., and Dooley, K. E. (2002). Faculty philosophical position towards distance education: Competency, value, and educational technology support. *Online Journal of Distance Learning Administration, V*, Retrieved August 23, 2003 from: http://www.westga.edu/~distance/ojdla/spring51/jones51.html

Klor de Alva, J. (2000). Remaking the academy. *Educause Review*, *35*(2), 32 – 40.

Lataif, L. E. (1998). Lifetime tenure: A working alternative. *Selections*, *15*, 16.

Markel, M. (1999). Distance education and the myth of the new pedagogy. *Journal of Business and Technical Communication*, *13*(2), 208 – 222.

Moloney, M. F., Dietrick, A. S., Strickland, O., and Myerburg, S. (2003). Using Internet discussion boards as virtual focus groups. *Advances in Nursing Science*, *26*(4), 274 – 286.

Moore, M. (1996). *A System View: What is distance education?* Retrieved April 12, 2004 from: http://www.cde.psu.edu/de/what_is_de.html

Olcott, D. Jr. and Wright, S. J. (1995). An institutional support framework for increasing faculty participation in postsecondary distance education. *The American Journal of Distance Education 9*(3), 5 – 17.

Paulson, I. (2002). Reconfiguring faculty roles for virtual settings. *The Journal of Higher Education, 73*(1), 123 – 140.

Redline, C. (2001). Effective Practice: Reluctant professors discover the power of Web-based tools. *Educause: Effective Practices and Solutions*, Retrieved August 23, 2003 from: http://www.educause.edu/ep/ep_item_detail.asp?ITEM_ID=81

Rockwell, K., Schauer, J., Fritz, S., and Marx, D. (2000). Faculty education, assistance and support needed to deliver education via distance. *Journal of Distance Learning Administration, 3*. Retrieved August 23, 2003 from: http://westga.edu/~distance/rockwell32.html

Rogers, D. L. (2000). A Paradigm Shift: Technology integration for higher education in the new millennium. *Educational Technology Review*, *6*(3), 19 – 27.

Ruch, R. S. (2001). *Higher Ed. Inc.: The rise of the for-profit university*. Baltimore, MD.: The John Hopkins University Press.

Ryan, M., Carlton, K. H., and Ali, N. S. (2004). Reflections on the role of faculty in distance learning and changing pedagogies. *Nursing Education Perspectives*, *25*(2), 73 – 81.

Schneider, S. J., Kerwin, J., Frechtling, J., and Vivari, B. A. (2002). Characteristics of the discussion in online and face-to-face focus groups. *Social Science Computer Review*, *20*(1), 31 – 42.

Shedletsky, L. J., and Aitken, J. E. (2001). The paradoxes of online academic work. *Communication Education*, *50*(3), 206 – 217.

Sloan-C-Resources (2005). Entering the maintstream: The quality and extent of online education in the United States, 2003 and 2004. Retrieved January 2, 2005 from: http://www.sloan-c.org/resources/survey.asp

Sumler, D. E. (2004). Unbundling the campus. *University Business*, *7*(1), 7 – 8.

Tierney, W. G. (1998). Tenure is dead: long live tenure. In W. G. Tierney (Ed.), *The Responsible University* (38-61). Baltimore, MD.: The Johns Hopkins University Press.

Vincent, A., and Ross, D. (2002). Monitoring quality of distance learning: How will accrediting agencies and universities cope? *International Journal of Management Poole*, *19*(3), 464 – 471.

Wolcott, L. L. (1997). Tenure, Promotion, and Distance Education: Examining the culture of faculty rewards. *The American Journal of Distance Education*, *11*(2), 3 – 18.

Wolcott, L. L., and Betts, K. S. (1999). What's In It for Me? Incentives for faculty participation in distance education. *Journal of Distance Education*, *14*, 34 – 49.

Endnotes

1. Capella University is accredited by The Higher Learning Commission and a member of the North Central Association of Colleges and Schools, 30 N. LaSalle Street, Suite 2400, Chicago, IL. 60602-2504, (312) 263-0456, www.ncahigherlearningcommission.org

Athabasca University

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

Selected Topics from a Matched Study between a Face-to-face Section and a Real-Time Online Section of a University Course

Mia Lobel
Concordia University
Canada

Michael Neubauer
Stanford University
USA

Randy Swedburg
Concordia University
Canada

Abstract

Two sections of an interpersonal skills building university course were observed for the purposes of this matched study. The face-to-face (F2F) section was in a classroom on the Concordia University campus in Montreal, Canada, while the non-turn-taking real-time online section used a Web application, LBD eClassroom© designed specifically for highly interactive large size classes and meetings. Two sections used the same instructor, facilitators, pedagogy, and course content. This study revealed a unique pattern of non-turn-taking synchronous interaction in the online section. Online students were found to be more likely to participate and express themselves. Interaction of online participants led to the creation of a group entity – a *polis* – a cornerstone for collaborative group learning. In contrast, in the F2F section, interaction followed the traditional classroom pattern – centered on the teacher or expert, resulting in fewer students interacting, and hence, lower interaction overall. In sum, during these three hour sessions, it was found that the nature of online non-turn-taking environment afforded online students more time to express themselves compared to students learning the same material F2F.

Introduction

In 2001, Concordia University in Montreal Canada funded a matched study to determine the differences – if any – between a similar the online courses and face-to-face (F2F) courses. This paper describes two findings from this study.

"AHSC/230 Interpersonal Communication and Relationships," offered by in the Applied Human Sciences Department of Concordia University, was the subject of this matched study. Section BB was offered F2F. Section CC was offered online. The same instructor taught these two sections

F2F and online, using the same pedagogy and same team of facilitators. Both sessions were divided into sub-parts, wherein all students met together or broke out into separate groups.

Results section of this paper is divided into two parts. In Part I, a group dynamics diagnosis was used to describe how the group develops, evolves, and becomes a productive entity over the course of one semester. In Part II, a single activity and processing period are studied in detail in terms of: 1) interactivity and use; and 2) perception of time.

Methods and Measurements

Face-to-face

Except for the presence of video cameras and crew, the F2F section took place in a traditional classroom setting at Concordia University in Montreal, Canada. The entire course was videotaped.

Online

LBD eClassroom© is a text and image Web-based application designed to host large online classes and meetings in a non-turn-taking synchronous environment. The LBD eClassroom© has attributes not found in conventional chat rooms – eClassroom© is designed to provides a synchronous online environment analogous to highly interactive F2F courses (Neubauer and Lobel, 2003). LBD eClassroom© has been used at Concordia University to teach online university courses for the last four years.

Data Collection

The F2F section was videotaped from beginning to end. Data collection for the F2F section included questionnaires, weekly journals, assignments, emails, and the manual review of the videotapes. Data collection for the online section included questionnaires, weekly journals, assignments, emails, and the LBD eClassroom© digital archives of online student activities.

Participants

Students (n = 21 females; n = 7 males) enrolled in the F2F class; all 28 students completed the course. Thirty-three students (n = 27 female; n = 6 male) enrolled in the online class; 32 students completed the course. One student (female) withdrew for medical reasons from the online course. Counting staff, guests, and observers, the typical size for the online class numbered 40 participants. The F2F class, numbered 35 participants, including students, instructional, and audio/ visual recording staff.

Content and Pedagogy

The teaching modules used for both the F2F and online class were designed using Kolb's Theory of Experiential Learning (Kolb, 1984). Both classes were tailored to deliver the same material, underpinned by the same theoretical learning cycle concepts: Inclusion, Concrete Experience, Reflective Observation, Abstract Conceptualization, Active Experimentation, and Weekly Journals.

Both classes met at first in the larger community and, eventually, after the Inclusion cycle, the Concrete Experience, the ensuing Processing, the Lecturette, and the Break, were dispersed into four smaller groups identified by the colors: Blue, Green, Purple, and Orange.

The template used to design the three hour teaching modules for both sections was built upon the instructor's 25 years of teaching in F2F settings, and three years of online teaching of courses in interpersonal communications and group dynamics.

Inclusion (15 Minutes)

At the beginning of each session – both F2F and online – participants were asked to familiarize themselves with each other by engaging in a safe activity. Content took the form of poems, meditation pieces, fables, quotes, and images. During this safe activity, participants tested each others' responses and established expectations, a process called '*gobletting,'* which Schultz (1988) says refers to strangers meeting, holding their goblets, and talking about inconsequential things.

F2F students sat in a large circle facing each other. The instructor began each F2F session with a Progressive Relaxation exercise (Lazarus, 1975), and read aloud the material posted in the eClassroom. Online students read the same material between sessions, but did not engage in the Progressive Relaxation exercise.

Concrete experience (30 Minutes)

Each F2F and online session started with an activity aimed at providing students with an experience that moves them toward the objectives of the class (see Appendix I). This activity is consistent with Dewey's concept that students' nature of experience is fundamental in education and training (Dewey, 1938; 1997). The Confucian quote (circa 450 BC): "Tell me, and I will forget. Show me, and I may remember. Involve me, and I will understand," is an excellent way to describe the intent of the Concrete Experience component. Activities, such as role playing, games, and other collaborative tasks, are designed to build participants' awareness of the experience (i.e., establishing students' relationships in terms of trust or assertiveness, or in terms of conflict or diversity, to name just two examples). Students are also instructed to observe their activities, yet not curtail their reactions (as much as possible).

Processing or reflective observation (30 Minutes)

Reflective Observation involves description, communication, and learning from the Concrete Experience. During the Concrete Experience activity, students were given "process questions" to elicit reactions inside themselves and with other participants, from which they were to formulate learning goals. Examples of the "Process Questions" are: What helped/ hindered your experience? How would you describe your reactions? What are some of the strengths/ limitations you brought to this experience? What would you like to change and how?

Abstract conceptualization or "lecturette" (25 - 60 Minutes)

The group synthesized the data generated during the Reflective Observation Processing section phase of the teaching module. In the F2F class, the instructor facilitates Kolb's Abstract Conceptualization using a "Lecturette" designed using a serial turn-taking discussion format. In the online class, the Lecturette is posted on the LBD eClassroom© using illustrated slides. After

reading the Lecturette, online students respond online to the instructor, to their facilitators, and to each other, thereby linking the course material to their experience in an interconnected web of non-turn-taking, free-flow of statement/ response discussion – thereby creating the noteworthy dynamic in which the synchronous online environment imposed its own demand, and thus accounted for several important differences presented in this paper.

Active experimentation (30 - 60 Minutes)

Active Experimentation consists of topic-related activities that allow participants an opportunity to practice new behaviors and follow up on the learning goals identified previously during the Reflective Observation/ Processing section of a teaching module. At this juncture, classes break-out into smaller groups. Active Experimentation affords students greater opportunity to engage in risk-taking and practice, and typically concludes with a small group Processing or Reflective Observation session.

Weekly journals

To facilitate Reflective Observation/ Abstract Conceptualization, the use of Weekly Journals guide students through a review of their learning cycle (Kolb, 1984) using Reflective Observation/ Abstract Conceptualization activities. Students use their Weekly Journals to record their observations, link their observations to theoretical concepts, and formulate a concrete, measurable, observable plans designed to engage the learner in change and/or acquire a self-identified skill.

Results Part I

A Group dynamics diagnosis

One method to diagnose group development is to examine interconnected areas of a group's dynamics (Dimock, 1985). The "Physical Climate" is one such an area (which is usually paired in discussion with the "Emotional Climate"). In F2F settings, the "Physical Climate" influences the group's dynamics in terms of space, lighting, ventilation, acoustics, temperature, seating arrangements, and so on (Dimock, 1985).

In online settings, however, each participant is typically at home and thus has control using over their physical environment. Comments about working in pajamas, working on kitchen tables, while lounging on sofas, or outside in the sunshine are examples of "chatter" commonly found in online conversations. In the LBD eClassroom©, one's classroom is the size of their computer screen. Some students enter this space and know how to use it right away, while others need some time to get comfortable with the environment.

During the first class, students are divided into the four colour-coded breakout groups. Students' initial concerns tend to center on resolving their need for "Inclusion" in the group (Schultz, 1988). "Inclusion" here is exemplified by the behaviors students use to show their individuality or claim a spot in group membership. Activities such as finding the right colours or the right buttons to click tends to be overshadowed by students' sense of urgency to "show a face" – i.e., upload their pictures. During this "inclusionary phase," other areas of group development tend to basically nonexistent. Involvement at this phase is totally self-focused and oriented, whereas group oriented participation is erratic and idiosyncratic. In short, there is little group cohesion and joint decision making at this point, and leadership is generally not yet evident or ignored.

In contrast, in F2F classes the "Inclusion" phase tends to be orderly and tightly managed by the instructor. It is not unusual for students to initially express surprise and display some minor discomfort, as the Applied Human Sciences Department's norm for this course involved everyone sitting in a circle, facing each other with no desks to act as boundaries. The cameras and camera crew also contributed to the de-familiarization of the F2F environment. However, the instructor, by using Inclusion oriented behaviors and activities, managed to create a warm, light, and supportive emotional climate during the first F2F class. Students took turns to introduce themselves; there was much humor and hand clapping. Facilitating activities, such as sorting students into break-out groups, were as simple as handing each student a piece of paper and pointing out the four group facilitators.

As recorded in the Weekly Journals, F2F students reported that their session was highly personal from the outset, with feelings of collegiality and camaraderie that appeared to deepened over time. Online students, on the other hand, first reported being at unease, feeling chaos, and sensing frustration – feelings which over time were replaced by a slow-growing sense of closeness (it must be noted here, that feelings of 'closeness,' however, remained tepid in larger online classes). During the small group sessions, however, online students reported that the emotional climate was open, accepting, supportive, and collaborative – a finding similar to that recorded by F2F students in their journals.

Our finding – that students in smaller online classes reported an emotional climate that is apparently similar to F2F students – raises an important question: If students in small online groups rated their satisfaction to be "open," "accepting," "supportive," and "collaborative," is it possible that they experienced perhaps even greater, more intense feelings than their F2F student counterparts? Clearly, this is a valid question that deserves further in-depth study.

By the last session of AHSC/230 Interpersonal Communication and Relationships, students in both F2F and online sections reported that they had learned to participate to the extent that each environment can allow. Both groups of participants reported that they felt involved and part of their 'class,' that they engaged in group decisions, and were supplied with leadership functions necessary to feel productive and satisfied with themselves and with the group.

A video camera recorded F2F students – i.e., which person participated verbally and nonverbally. However, for instructors seeing students sitting in class in silence and without the ability to read individual students' minds, only the student knows for sure her or /his "quality" of being attentive. This can be compared with the LBD eClassroom©, which has been designed to record and gather data on how students are "attending." As such, it is possible to extrapolate the level participant's' behavior beyond that of than simply posting a comment (Lobel, Neubauer, and Swedburg, 2002b).

Another way to make sense of group interaction and group development is to classify the content of all statements exchanged between participants, in both F2F and online contexts. Classifications can be either addressing the task/content; maintenance/ process of the self/ group. To achieve optimal group productivity, it is necessary to find a balance between the task-oriented and maintenance-oriented communication (Dimock, 1985). Our inquiry reveals that both the F2F and online groups functioned reasonably well, and the task-oriented and maintenance-oriented functions were similarly well attended.

It is also suggested here that the nonverbal statements exchanged F2F are also being exchanged online. Qualitatively, posting online comments that contain emoticons, one word or two word comments, icons, gifs, and colored text, etc., form a shared experience for each online participant.

This finding is confirmed by Kellogg and Erickson (2002) who state: "Collective awareness occurs when two or more people are aware of the same context and each is aware that the others are aware of it. Although subtle, this awareness of others' awareness is crucial to supporting collaboration. Collective awareness underlies social phenomena like peer pressure, accountability, and competition" (pg., 1).

Results Part II – Interactivity

Activity can center on the task and/or course content – specifically, what is being done. Activity can center on maintaining social relationships or the process – specifically, how it is being done (Dimock, 1985). Consider an orchestra. The content is the score for all the musical parts. The process is the performance of the music when the parts of the score are played together. The resultant symphony is greater than the sum of all the parts that went into it.

A group's symphony may be analyzed in similar ways. Socio-metric measures, a method of socio-psychology developed by the psychiatrist Moreno (1934), can be applied to analyze interpersonal emotive relationships within a group. These methods can be used to identify informal leaders, determine social rankings within the group, and reveal isolated individuals.

Creating "social visualizations" is another way to conceptualize the process of inquiry. A social visualization is a visual (sonic or other perceptual) representation of information from which the presence, activities, and other characteristics a social collectivity may be inferred, and, by extension, can provide the basis for making inferences about the activities and characteristics of the group as a whole (Light, 2003; Kellogg and Erickson, 2002).

Interactivity can be observed and measured by figuring out: Who speaks to whom? How often? How long? Who are the over/ under participators? Some of the socio-metric instruments used to make sense of the data collected for this study were: Participation Pattern Diagram (Lobel, et al., 2002b) based on the Interaction Diagram (Dimock, 1985), the GUIDATA© (Lobel et al., 2002b), the Hubs of Influence Diagram (Lobel et al., 2002b), the spoken length of written words, and the elapsed time of a participant's F2F statement.

Methodology

Participation pattern diagrams were created by using the social networking software, *Ucinet* (Borgatti, Everett, and Freeman, 1999) and *Pajek* (Batagelj and Mrvar, 1996). The center of the diagram is defined as the hub of authority (Lobel et al., 2002b), and represents the participants to whom most of the statements were directed. The farther the participant's name is from the center of the diagram, the fewer statements that particular participant directed toward the center hub of authority. Every directed interaction (who spoke to whom) is represented by a line between the sender and the receiver of the statement or comment, with an arrow pointing to the receiver.

Results

We chose one session at random to compare the online and F2F interaction. The data displayed in Figures 1 and 2 use a typical Participation Pattern Diagram, reflecting what was generally found in general in the two environments. This Participation Pattern Diagram describes who spoke to whom and how often over a period of 30 minutes in the two learning environments: F2F and online. Students were asked to 'mill around,' find three people who exhibited an ascribed attribute (i.e., spoke four languages, had children, etc.), and engage in brief discussions with as

many other students as possible. During the Processing Periods shown in Figures 1 and 2, students were asked to discuss how they fit in, how they connected, what interpersonal skills helped, and what interpersonal skills others used to connect.

Different patterns emerged that defined the manner and method of participation among members of the online class and F2F class.

Figure 1. Online Session 2 Participation Pattern Diagrams for 30 minutes of processing after the activity. "S" refers to the students, "PI" refers to the principle instructor, and "F" refers to the facilitators.

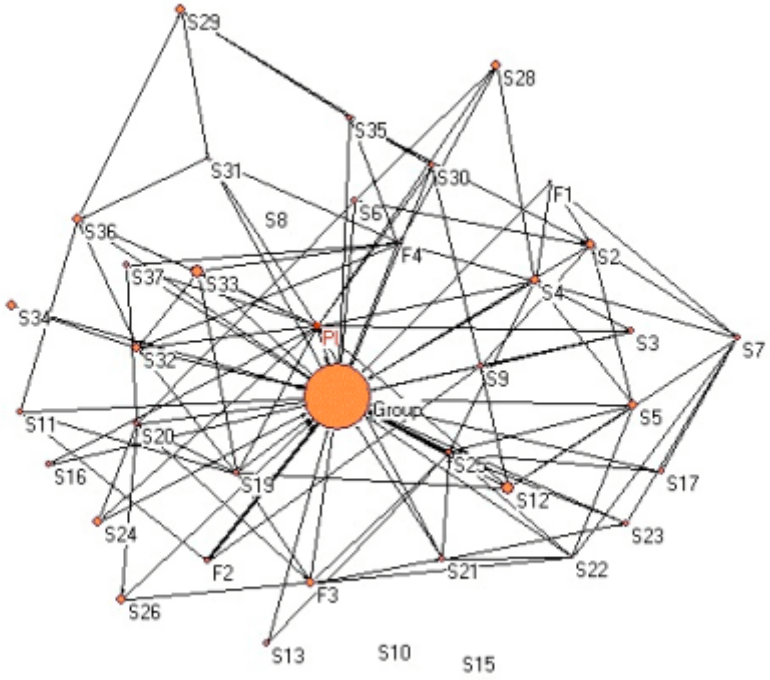


Figure 2. Face-to-faceF2F Session 2 Participation Pattern Diagrams for 30 minutes of processing after the activity. "S" refers to the students, "PI" refers to the principle instructor, and "F" refers to the facilitators.

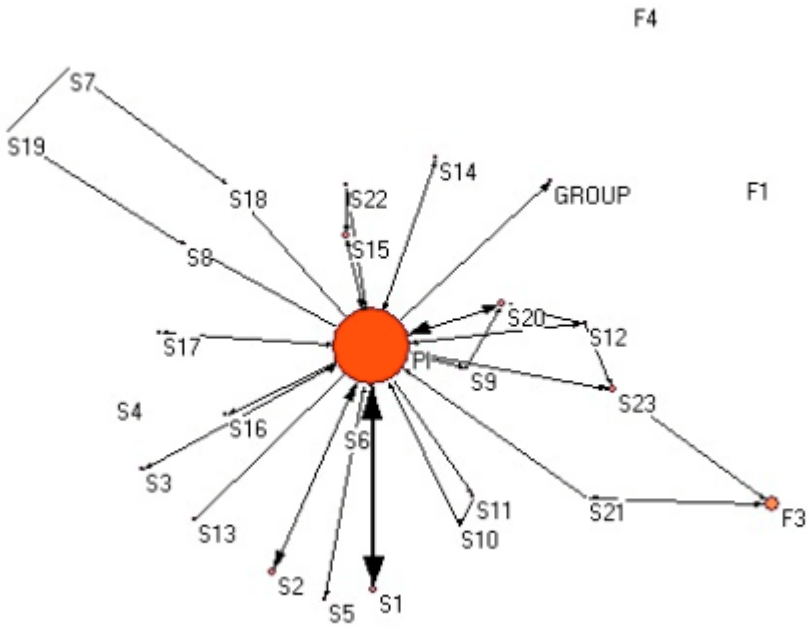


Figure 1, shows 100 percent participation by all 33 online students. Figure 2, on the other hand, reveals 82 percent (n = 23) participation among students in F2F class (n = 28 registered students), for a ratio of 23:28 students. The overall percentage of participation is a facet of interactivity in which the data reveals as different for the two environments. Typically, the percentage of online participation remains 100 percent over time; during each online session, all students contribute something to the group narrative. In the F2F sessions, however, the percentages of students participating verbally varies from 82 percent (during discussions) to 10 percent (during lectures), and only reaches 100 percent if students are specifically requested to do so by the instructor, or by the activity assigned.

Discussion

An important difference between the online and F2F class is the central hub of interaction. In online discussions, it is the group entity (*polis*) that is at the center of the diagram, while during F2F discussions it is the instructor who is the central hub. In the online class, more student statements were addressed to the group entity/ *polis*, than to the instructors or each other individually. Conversely, students in the F2F class addressed the instructor more often than they addressed each other. Another interesting observation from this sample is that the group entity does not appear to have the same prominence or influence in the traditional F2F environment as it did online.

This evidence suggests that this group-centered versus authority-centered pattern of interaction shows a fundamental value shift in the teaching paradigm for this type of course. An interactive classroom used to teach interpersonal skills is expected to serve as an arena in which appropriate self-disclosure, feedback, and discovery take place. Openness and translucence are seen as factors

that facilitate the trust formation needed to risk these types of interpersonal behaviors. This is true in F2F classrooms. Online, however, the process itself is even more inherently transparent – everyone can see all the ingredients that go into the ongoing class narrative. One of the objectives of this type of class is that all the students participate and collaborate in constructing communication knowledge and relational skills.

It is postulated, therefore, that many of the interactions that online are explicitly addressed to the group entity or *polis* (e.g., narrative such as "sigh" or emoticons) are collapsed into non-verbal interactions in F2F settings. These non-verbal interactions saturate the atmosphere of the hum-buzz of F2F group babble (i.e., music of the group), and are exchanged in dyads, or sub-vocally, or with instruments like pens clicking, fingers drumming, etc. It is postulated here, therefore, that some of the online statements addressed to the group entity may serve a similar function as the F2F hum-buzz observed and recorded in the videos. Many online statements addressed to the group entity are pertinent and include constructive comments that in F2F settings could not have been exchanged or made available to the entire group due to natural time constraints built into the serial nature of F2F interaction (as discussed in the next section).

The online interaction patterns observed in this study substantiate that a group is a distinct entity formed by the sum of its members – more importantly, it shows that group interaction can become greater than the sum of all its parts, and comes complete with its own idiosyncratic character and life span. Specifically, the group entity phenomenon observed suggests that the power of the group to publish itself as a written document, which can be read and archived and re-read later, can resonate to others beyond that of the original group. No such opportunity occurs in F2F settings – even in videotaped sessions which only can record the group hum-buzz. These implications are fundamental to teaching and training settings that depend on collaborative learning, no matter where it occurs. In the online class, evidence of 100 percent participation and interaction among all participants attests to this group dynamic, one which can be measured and recorded, and which supported in findings from previous studies (Lobel, Neubauer, and Swedburg, 2002b). As any teacher knows, many participants in their F2F classes may remain silent – but look at the recorded dialog of the online synchronous class, you will see an abundance of dialog.

The Interaction Diagram for the online class points to interactions between many people, looping and overlapping, with some students participating in several loops. The closed loops represent multiple topic-related exchanges between the members and are seen as illustrations of building on the knowledge/ comments of others. Students in the online class created significantly more closed loops than the students in the F2F class; in this sample, everyone in the online class was addressed or responded to at least twice. In the F2F class, only five discussion loops are simple and observable: six participants remained silent; another six participants were addressed/ responded only once, and these exchanges only occurred between students and the instructor. In the online class, the loops are numerous, multi-layered, and complex, representing a fundamentally different mode of communication, an observation which was previously described in the literature (Lobel, Neubauer, and Swedburg, 2002a). The nature of the synchronous online communication in this study can described as: "non-turn-taking discussion," a type of discussion that creates complex and visible interconnectedness of a web.

During class discussions, online students have the advantage of the entire group's point of view (i.e., all views from instructors, facilitators, and peers). F2F students generally tend to derive benefit only from their instructor's statements. In addition, in the online class, the web of statements generated is recorded and remain accessible to all participants as exactly created, independent of memory, after the event is over. The Scroll Back and Archive functions are

invaluable teaching and training tools that enable participants to refer back to the exact instructions or classroom narrative recorded earlier. Online participants use these functions for feedback on behaviors; to search for specific examples to illustrate statements; and even reconcile perceptions of an 'event' amongst themselves. This advanced level of archiving and functionality is simply not available in F2F settings.

The online Participation Pattern Diagrams show that the center of the group can be visualized as a 'physical space,' akin to the ancient *polis*, defined as a community center, or a place where community dialogue occurs. This definition implies a sacred ground, wherein its members exhibit and leave their offerings for all to see and use.

Results Part II – Time

Time and the perception of time has been identified as an area in which F2F turn-taking interactions differs significantly from online non-turn-taking interactions. The time allotted for F2F discussion is finite; time is progressively used up as each successive participant takes their turn to speak. In short, once time runs out for the entire group, it is over. Many online classes too are predicated on turn-taking interaction, such as that that occurs during audio and video presentations. In a non-turn-taking synchronous interaction environment, however, everyone has the same amount of time to interact and they can all interact simultaneously.

Methodology

The same time period and session analyzed in Figures 1 and 2 are now analyzed in terms of the use and perception of time.

A common metric was used to compare the text and image-based online class to the video recorded F2F class. We converted the words written in the online environment to an equivalent unit of time (15 words for each six seconds of speech). In the F2F class, the video time stamp was used to determine the start and stop time of each participant dialog (data segment) during the discussion period. The conversion factor – 150 words per minute (Sanderson, Siple, and Lyons, 1999, p.13) – is the hard word count for turn-taking auditory interactions (in any medium) needed to remain comprehendible. This conversion factor – 150 words per minute – means that 15 written words written equal six seconds of speech.

A software program was used to extract the data from the online archives and automatically create the graphic results. The F2F data, as observed from the videotapes of the sessions, was recorded manually.

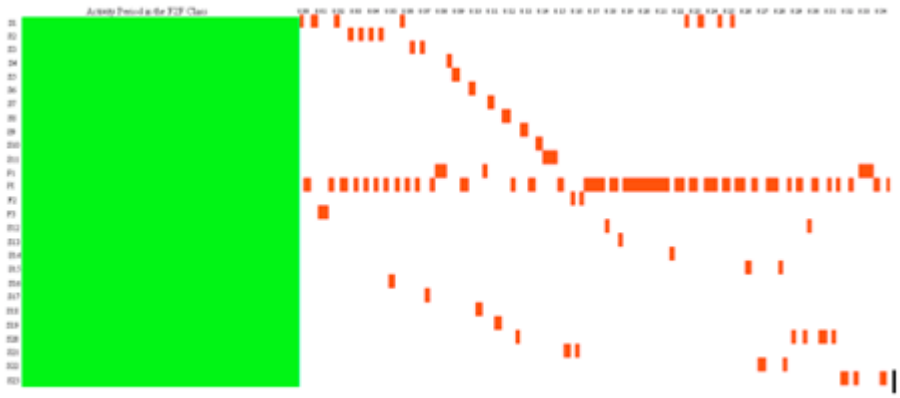
Results

Figures 3 and 4 show how time was used in the discussion phase of both F2F and online sessions; these are plotted as Participation Diagrams in Figure 1 and 2. In addition to the 30 minutes of the processing period presented, Figures 3 and 4 contain the interaction during the "milling around" activity that preceded the discussion phase.

In the F2F class, the activity period is depicted as a solid green square (Figure 3), because participants were milling around the room, interviewing each other, and talking simultaneously. All individual utterances disappeared into the solid block of F2F group hum-buzz for 28 minutes. Subjectively, this collective experience was that of energetic, upbeat conversation, composed of

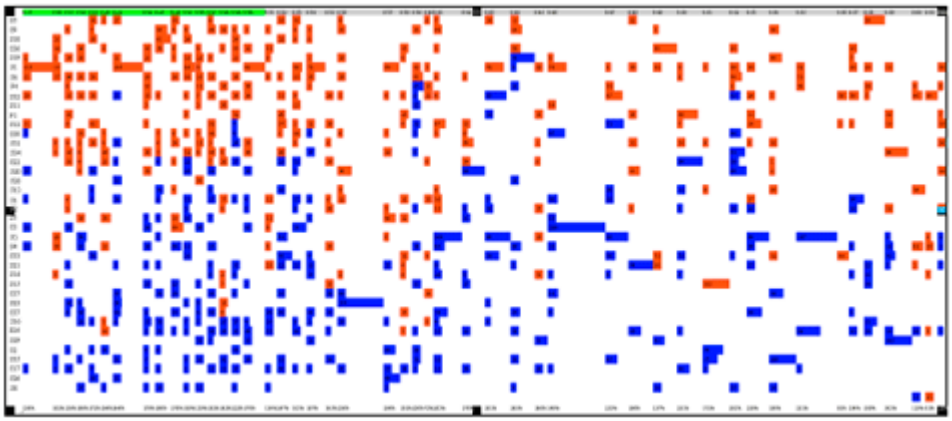
everyone and representing no one. The length of each red bar corresponds to the length of time a participant took during the F2F turn-taking interaction. Once the Processing period begins, the red bars in Figure 3 clearly portray how the 30 minute time-frame was apportioned between the various participants, with the instructor using up the lion's share of time available.

Figure 3. Time-use in the turn-taking, face-to-faceF2F class. The activity portion is in green. The processing period is after the green. The red bars total 30minutes in the turn-taking, face-to-faceF2F interaction. The scale is expanded in this region so the red bars are proportional to time. Each row represents a participant in the discussion.



For the online class, the green bar on the upper left edge of Figure 4 identifies the 30 minutes of interaction during the activity portion of the class. It was observed that the online interaction was as vigorous and as distributed as F2F, the only difference being that the online statements were transparent and available to all participants as they unfolded. Each column in Figure 4 represents one minute of elapsed time during the online discussion. The red bars represent statements totaling 150 words. The blue bars in the same column represent the statements that would not be possible to make in any turn-taking environment due to the 150 word per minute limitation.

Figure 4. Time-use in the online class. The green bar represents the activity period. After the activity period, there are 30 columns, one per minute. The red bars total 30 minutes of statements, while the blue bars total 46 minutes – for a total effective time of 76 minutes worth of statements in the non turn-taking environment. Each row represents a participant in the discussion.



Discussion

The rows with blue bars in Figure 4 represent online students who would not have been able to speak F2F – even if they so desired – because there simply was not enough time.

This study shows that there is significantly more data flow in terms of words and statements generated in the LBD eClassroom© than in the traditional F2F turn-taking settings. Evidence from this study also shows that online class students send and receive more statements among themselves compared to F2F students engaged in traditional classroom settings. It is postulated here, therefore, that this increase flow of statements between and among online participants facilitates the construction of 'collaborative knowledge.' Because data flow is also linked to 'trust formation' which is found by Gibb and other process theorists (see Lobel, Neubauer, and Swedburg, 2004) to be essential to learning, also suggests that trust levels (permission to share thoughts and ideas) is higher among online students than F2F students.

These findings point to significant differences between turn-taking and non-turn-taking interactions. This finding also raises several important questions: Do participants engaged in synchronous non-turn-taking interactions create more time for themselves? What are the implications/ applications of the extra 46 minutes it takes to read out the statements generated in a 30-minute real-time discussion with 35 other students versus F2F turn-taking instructor centered discussion? If time is money, do online participants benefit more than their F2F counterparts? And if so, how? If information is power (i.e., data flow generated in online classrooms is greater, more varied, visible, and lasting) are online students more productive and do they have a better sense of themselves and others?

Conclusion

This paper examines two findings of a matched-study designed to investigate similarities and differences between two teaching environments: traditional face-to-face (F2F) turn-taking environment; and an online non-turn-taking environment using the LBD eClassroom©. Two sections of the same course were taught online and F2F. The course objectives, content, and pedagogy (experiential learning) were the same for both the F2F and online sections, as were the teaching team, the time frames and class duration, course assignments and grading criteria.

One session described in this paper was randomly selected from the larger data pool. Perhaps because the most glaring differences between learning F2F and learning online relate to interactivity, the tone of this report may infer a preference for online education. This is not the case. Each environment has its distinct advantages. The issue here, therefore, is not which venue is better or worse. The intent of this inquiry was simply to understand – in terms of similarities and differences – online and F2F learning settings, findings upon which we hope can lead to more relevant online learning theories that result in improved teaching effectiveness across the board.

Interactivity is at the core of the course material used in the matched study. It is assumed that in an emotional climate of 'trust and acceptance,' and the data flow generated by participants in a group will lead to more effective goal formation, which in turn imparts a sense of control to those involved, which in turn further increase trust, data flow . . . and so on. Of course if this process reversed, it will produce the equivalent downward spiral: fear will lead to silence, which will reduce known options or choices and lead to low productivity and a sense of dissatisfaction with

oneself and the group (Gibb, 1964). The course content and process is built on the rationale that visibility yields awareness, accountability, connection, which in turn enhances productivity and feelings of well being. Feedback and self disclosure are seen as effective tools for reducing the blind area in an individual's or a group's self awareness, thereby improving the entity's ability to do its work (Luft, 1969).

When comparing F2F to online interaction in the Main Group, the Participation Pattern Diagrams (Figure 2) point to distinctly different patterns of interaction in the two environments. F2F, the majority of verbal interactions were between the instructors and the students. Online, the instructor (as the hub of most statements) was replaced by a group-entity, akin to a *polis*; students interacted not only with their instructor, but also with each other to form a *polis*. Important differences in the sheer number of statements exchanged online compared to the number of statements exchanged F2F speaks to the higher level of data flow available to the online group and to the ability of the LBD eClassroom© to facilitate such flow.

It was also postulated that the group entity (*polis*) is the repository of information that in F2F settings constitutes the constant hum-buzz of a classroom – information that would typically be buried and not available (e.g., not be published due to lack of time, participants' reticence to speak, and so on). This comparison validates our idea that F2F interactions in this study are basically expert-centered.

Perhaps the most surprising finding to emerge from this matched study – one that we feel may have the greatest implications and application – is the issue of hyper-time, or the extra time that is created online – time that allows for additional data flow and increased productivity. Foulger (2002) in: *Building Time Machines: thinking about the future of interpersonal communication*, discussed ways of "bending time" online. He defines "supersynchrony" as "receiver control of level of synchrony with parallel interactions" (http://foulger.info/davis/research/timeInMedia2/) wherein users have the ability to break and restore communication linearity. This means that the environment is collecting and making available all the statements exchanged thus far, so that all participants can scroll back from the moment the statements was posted, while interacting presently in the here-and-now, resulting in several conversations happening all at the same time (which are archived for later use). Such hyper synchronous, multi-layered online interaction not only connects each participant in a web of discussion, it affords each participant time to respond during the online synchronous discussion and time to reflect and digest what was said in the archives. The LBD eClassroom© unfolds on a different timeline, one which produces and energizing learning experience while in progress, and an arena for reflective thought after it has finished. Simply put, it appears that the specific type of online communication observed creates more time!

References

Batagelj, V., and Mrvar, A. (1996). *Pajek, a freeware software program for large network analysis.* University of Ljubljana, Slovenia. Retrieved February 25, 2002, from: http://vlado.fmf.uni-lj.si/pub/networks/pajek/

Borgatti, S. P., Everett, M. G., and Freeman, L. C. (1999). *UCINET 5.0 Version 1.00*. Natick: Analytic Technologies.

Dewey, J. (1938; 1997). *Experience and Education.* New York: Simon and Schuster.

Dimock, H. (1985). *How to observe your group.* Center for Human Resource Development Monograph Series for People working with People, 1 – 46.

Foulger, D. (2002). *Building Time Machines: Thinking about the future of interpersonal communication.* Oswego State University Cognitive Science Lecture Series, 2002. Retrieved August 16, 2003 from: http://www.oswego.edu/~dfoulger/research/timeInMedia2/

Gibb, J. R. (1964). Climate for Trust Formation. In L. P. Bradford, J. R. Gibb, and K. Benne (Eds.) *T-group Theory and Laboratory Method* (279-309). New York: Wiley.

Kellogg, W., and Erickson, T. (2002). *Social Translucence, Collective Awareness, and the Emergence of Place.* Retrieved September 6, 2003 from: http://modiin.njit.edu/workshops/cscw2002/Kellogg.pdf

Kolb, D. A. (1984). *Experiential Learning.* Englewood Cliffs, NJ.: Prentice-Hall.

Lazarus, A. (1975). *Learning to Relax* (Tape). Institute for Rational Living, Inc.

Light, A. (2003). *CHI 2003: How to Make Group Environments Social.* Retrieved September 13, 2003 from: http://www.usabilitynews.com/news/article1237.asp

Lobel, M., Neubauer, M., and Swedburg, R. (2002a). Elements of group interaction in a real-time synchronous online learning-by-doing classroom without f2f participation. *USDLA Journal*. Retrieved May 5, 2002 from: http://www.usdla.org/html/journal/APR02_Issue/article01.html

Lobel, M., Neubauer, M., and Swedburg, R. (2002b). The eClassroom used as a Teacher's Training Laboratory to Measure the Impact of Group Facilitation on Attending, Participation, Interaction, and Involvement. *International Review of Research in Open and Distance Learning, 3*(2). Retrieved August 13, 2003 from: http://www.irrodl.org/content/v3.2/lns.html

Lobel, M., Neubauer, M., and Swedburg, R. (2004). Con-text? (An Inquiry) *DEOSNEWS, 13*(3). Retrieved December 20, 2005 from: http://www.ed.psu.edu/acsde/DEOSNEWS_13-3.pdf

Luft, J. (1969). *Of Human Interaction*. Palo Alto, CA.: National Press.

Moreno, J. L. (1934). *Who shall survive?* Washington, DC.: Nervous and Mental Disorders Publishing Co. (Reprinted 1953). New York: Beacon House.

Neubauer, M., and Lobel, M. (2003). The Learningbydoing eClassroom©: Learning Technology Task Force (LTTF). *Journal of Learning Technology, 5*(3), IEEE Computer Society. Retrieved August 12, 2003 from: http://lttf.ieee.org/learn_tech/issues/july2003/

Sanderson, G., Siple, L., and Lyons, B. (1999). Interpreting for Postsecondary Deaf. *Report of the National Task Force on Quality of Services in the Postsecondary Education of Deaf and Hard of Hearing Students.* Rochester, N.Y.: Northeast Technical Assistance Center, Rochester Institute of Technology. Retrieved August 16, 2003 from: http://www.rit.edu/~netac/publication/taskforce/interp/

Schultz, W. (1988). *Profound Simplicity*, 3rd Ed. Muir Beach, California: WSA.

Appendix

Course Objectives

Session 1: Introduction

Dates: Monday, September 16, 2002, and Thursday, September 19, 2002

- To unravel the logistics of the eClassroom and create technical protocols for eClass interaction
- To orient students in online interaction netiquette and culture
- To institute ground rules and appropriate behavioral norms
- To explore how to create a social presence online
- To introduce the process of writing your learning journal

Session 2: Inclusion

Dates: Monday, September 23, 2002, and Thursday, September 26, 2002

- To experience and observe how you negotiate membership in a group.
- To identify and articulate norms of human conduct.
- To demonstrate how self-disclosure is “icebreaking”.
- To link your inclusion style to theory.
- To identify interpersonal strengths and limitation connecting with others.

Session 3: Self Awareness

Dates: Monday, September 30, 2002, and Thursday, October 3, 2002

- To illustrate the role self-awareness plays in effective interpersonal communications.
- To practice appropriate self-disclosure and appropriate feedback.
- To demonstrate how fear limits students’‘ ability and willingness to communicate effectively.
- To understand the role fear may play in achieving interpersonal needs or desires.
- To explore the skills needed to enlarge each student’s, and the whole class’s open area.
- To articulate observable, concrete, measurable steps to achieve a desired interpersonal goal.

Session 4: Self-Disclosure/ Feedback/ Trust

Dates: Monday, October 7, 2002 and Thursday October 10, 2002

- To experience the role of Self-Disclosure in interpersonal trust formation.
- To experience how we are more similar than different from each other.
- To experience how the awareness of ’being in the same boat’ increases the willingness to communicate authentically
- To illustrate the roles and rules of Feedback in the communication process.

- To commit to the process of increasing the Open Area of the community's Johari Window.

Session 5: Values Clarification

Date: Monday, October 21, 2002 and Thursday, October 24, 2002

- To experience the process of values clarification.
- To demonstrate the 'power' of diverse worldviews and to encourage acceptance of others.
- To increase awareness of interpersonal choice and response ability.
- To explore behavioral communication skills, like Active Listening, as useful tools for enhancing interpersonal connections.
- To introduce students to the concepts of problem solving and conflict management.
- To illustrate how people 'buy and sell' values.
- To practice collaborative behaviors based on accepting and valuing of diversity.

Session 6: Perception

Dates: Monday, October 28, 2002, and Thursday, October 31, 2002

- To explore issues in 'Perception' and to demonstrate the impact diverse phenomenological realities may have on interpersonal communications.
- To increase awareness of a natural tendency to make interpretations and react 'as if' these assumptions were absolute facts.
- To practice 'checking out' assumptions, before reacting to another.
- To demonstrate and encourage the acceptance of diversity.

Session 7: Assertiveness

Dates: Monday, November 4, 2002 and Thursday, November, 7, 2002

- To understand that 'assertiveness' 'aggressiveness' and 'passivity' are a set of beliefs, acquired skills and behaviors based on experience, which can be learned and can be unlearned.
- To define 'assertiveness' as:
    - The ability to communicate clearly and honestly
    - The courage to stand up for oneself without violating one's rights or another person's rights
    - The willingness to express one's needs and feelings in ways, which reduce anxiety both for the sender and for the receiver.
    - To familiarize students with the guide lines for appropriate assertive behaviors
    - To explore available assertiveness training techniques and behavioral tools.
    - To practice assertiveness by role-playing real life situations.

Session 8: Assertiveness/ Conflict

Dates: Monday, November 11, 2002, and Thursday, November 14, 2002

- To facilitate students in identifying and understanding their own Conflict Management Styles.
- To increase awareness of the role emotion and values play in the conflict resolution process.
- To provide opportunities which facilitate the practice of collaborative skills building.
- To explore the advantages and disadvantages of the varied conflict resolution approaches, with a focus on collaboration and 'win/ win' outcomes.
- To increase awareness of negotiation skills.
- To provide a safe experiential opportunity for practicing Active Listening during a conflict situation.

Session 9: Review/ Synthesis

Dates: Monday, November 18, 2002, and Thursday, November 21, 2002

- To link the concepts covered in the course to practical experience.
- To provide an opportunity to review and practice the skills covered in the course.
- To reflect on the communication skills learned and identify the skills still in need improvement.
- To illustrate the roles our emotions and values play in maintaining interpersonal relationship and accomplishing the individuals' goals.
- To provide an opportunity, which facilitates the practice of collaborative skills building.
- To explore the advantages and disadvantages of the varied conflict resolution approaches, with a focus on collaboration and 'win/win' outcomes.

Session 10: Gives and Gets

Dates: Monday, November 25, 2002, and Thursday, November 28, 2002

- To review the topics covered
- To wrap up unfinished business
- To provide closure
- To facilitate an action plan for the future

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

Sources of Difference in Reliability: Identifying sources of difference in reliability in content analysis of online asynchronous discussions

Elizabeth Murphy and **Justyna Ciszewska-Carr**
Memorial University of Newfoundland
Canada

Abstract

This paper reports on a case study which identifies and illustrates sources of difference in agreement in relation to reliability in a context of quantitative content analysis of a transcript of an online asynchronous discussion (OAD). Transcripts of 10 students in a month-long online asynchronous discussion were coded by two coders using an instrument with two categories, five processes, and 19 indicators of Problem Formulation and Resolution (PFR). Sources of difference were identified in relation to: coders; tasks; and students. Reliability values were calculated at the levels of categories, processes, and indicators. At the most detailed level of coding on the basis of the indicator, findings revealed that the overall level of reliability between coders was .591 when measured with Cohen's kappa. The difference between tasks at the same level ranged from .349 to .664, and the difference between participants ranged from .390 to .907. Implications for training and research are discussed.

Keywords: content analysis; online discussions; reliability; Cohen's kappa; sources of difference; coding

Introduction

According to Berelson's (1952) early definition, content analysis is "a research technique for the objective, systematic, and quantitative description of manifest content of communication" (p. 18). Kolbe and Burnett (1991) define it as "an observational research method that is used to systematically evaluate the symbolic content of all forms of recorded communication" (p. 243). In the context of computer conferencing, content analysis has been described as a "research methodology that uses a set of procedures to make valid inferences from text" (Kanuka and Anderson, 1998, p. 59). As with other fields of research, reliability is an essential characteristic of content analysis (Lombard, Snyder-Duch, and Bracken, 2002). In the context of content analysis of discussion transcripts, reliability is usually discussed in terms of interrater reliability, also referred to in literature as intercoder reliability, or more specifically interrater agreement, which refers to the extent of agreement between independent coders on the rating or code they assign to each object in the study (Krippendorff, 1980).

Kolbe and Burnett (1991) observed that "interjudge reliability is often perceived as the standard measure of research quality" and "[h]igh levels of disagreement among judges suggest

weaknesses in research methods, including the possibility of poor operational definitions, categories, and judge training" (p. 248). Singletary (1994) suggests that reliability is "near the heart of content analysis" and argues that "if the coding is not reliable, the analysis cannot be trusted" (p. 294). Similarly, Neuendorf (2002) argues that, without establishing strong reliability, "content analysis measures are useless" (p. 141). Therefore, "if content analysts cannot demonstrate strong reliability for their findings, then people who want to apply these findings should be wary of developing implementations" (Potter and Levine-Donnerstein, 1999, p. 258).

Surprisingly, and despite agreement on the importance of reliability, it has been rarely assessed and reported in transcript analysis research in the past (Lombard et al., 2002; Neuendorf, 2002; Rourke, Anderson, Garrison, and Archer, 2001). Rourke and Anderson (2004) claim, however, that journal editors are becoming more demanding and researchers more conscientious about reporting reliability. Lombard et al. (2002) conducted a review of 200 articles on content analysis in communication research and found that, while 69 percent of them reported reliability, most provided little discussion on reliability procedures and results. Rourke et al. (2001) reviewed 19 published studies on transcript analysis of online discussions and found that, while 11 reported reliability, the majority of those studies did not provide any discussion on the issue. Additionally, of the studies that reported reliability, most used a simple percent agreement to calculate the level of agreement between coders or raters. Many methodologists, however, consider the percent agreement to be an inadequate measure of interrater reliability since it does not account for agreement between coders that is expected to happen by chance (Carletta, 1996; Lombard et al., 2002; Rourke, et al., 2001). Only three of the studies reviewed by Rourke et al. (2001) reported the use of a chance-corrected measure of interrater agreement, and in all cases, the choice was Cohen's kappa. For a discussion on chance agreement see Potter and Levine-Donnerstein (1999).

Use of Cohen's kappa to calculate overall reliability between two coders, however, will not provide a fine-grained measure of actual differences that might occur in coding a transcript of an Online Asynchronous Discussion (OAD) with different variables such as multiple tasks and discussants. Crocker and Schulz (2001) in a discussion of interrater reliability of manually-scored test items point attention to the need to consider sources of difference besides those between coders. These authors argued that conventional estimates of reliability do not distinguish between various sources of difference: "[a]ll are lumped together in producing an overall reliability coefficient" (Crocker and Schulz, 2001, p. 3). As an example of the types of differences they cite, task variation can be more important than scorer variation. Likewise, Neuendorf (2002) and Tinsley and Weiss (1975) argue that reliability values need to be calculated and reported for each measured variable. While this approach may not be appropriate for all contexts of quantitative content analysis, it was, for instance, adopted by Garrison, Anderson and Archer (2001) who calculated interrater reliability value for 12 indicators of social presence. The majority of studies, however, still tend to provide only the overall value of agreement between coders.

The purpose of the case study reported in this paper was to identify and illustrate sources of difference in reliability in the quantitative content analysis of a transcript of an online asynchronous discussion. Differences were investigated between two coders, eight tasks, and 10 students who we will refer to as participants in the remainder of the paper. Moreover, the extent of agreement in relation to all three variables was calculated separately for the three hierarchical levels of coding categories: two categories, five processes, and 19 indicators. Cohen's kappa was used to calculate levels of reliability (see Cohen, 1960 for an explanation of the mechanisms of kappa). Results obtained with this measure illustrate how differences can occur, not only between coders, but as a result of other variables such as different tasks or participants. This paper discusses implications for the training of coders and for research. The background section discusses the eight tasks participants completed in the online discussion analyzed in the study.

Included in this section is a description of the instrument used for the analysis of the discussion. Following the background section is a presentation of the method.

Background

Discussion forum

The discussion was a part of a Web-based learning module focused on engaging learners in Problem Formulation and Resolution (PFR). The un-moderated discussion was pre-structured with eight tasks or prompts including an introduction and conclusion. The six other tasks paralleled steps in a problem-solving model presented in the module. The introduction or Task 1 required participants to reflect on their initial knowledge of the problem, and compose a message in which they described their understanding of the problem. In Task 2, students were asked to describe how their understanding of the problem changed as a result of learning about how some practitioners experience the problem. Task 3 required participants to react to the reflection of at least one other participant. In Task 4, students had to compose a message to describe how their understanding of the problem had changed as a result of having read an article discussing the problem. For Task 5, participants had to react to the reflection of at least one other participant. Task 6 asked students to post a message in which they "acted on the problem", and to suggest some ways that the problem could be dealt with "in a systematic and visible way." In Task 7, students had to respond to a proposed action of one other participant, and to reflect on the strengths and weaknesses of the proposed action. Finally, in the conclusion or Task 8, participants were asked to describe how, in the future, as practitioners, their behavior and thinking might be different as a result of having participated in the online module.

Coding Instrument

The instrument used for coding was designed by the principal investigator (Murphy, 2004b) and represents a second iteration. This second iteration was developed after a second round of testing designed to identify instances of construct under-representation, construct irrelevance, and lack of discriminant capability in the instrument. The first iteration was developed through a conceptual framework derived from the literature and subsequent testing through the analysis of an online discussion (see Murphy, 2004a).

The coding instrument is comprised of three hierarchical levels. At the first level, there are two main categories: Problem Formulating (F) and Problem Resolution (R). The categories are further divided into processes. The category of Formulation includes two processes: Defining Problem Space (FD) and Building Knowledge (FB). The category of Resolution includes three processes: Identifying Solutions (RI); Evaluating Solutions (RE); and Acting on Solutions (RA). Finally, each of the five processes is further divided into a total of 19 specific indicators of behavior. The process of Defining Problem Space includes seven indicators, such as Agreeing with Problem as Presented in the discussion (FDA) or Identifying Causes of the Problem (FDIc), while the process of Building Knowledge includes four indicators. Under the category of Resolution, the process of Identifying Solutions (RI) includes two indicators, such as Proposing Solutions (RIP); the process of Evaluating Solutions includes four; and the final process of Acting on Solutions (RA) includes two.

Method

Volunteer participants in the study were seven graduate and three undergraduate students. Participants identified numerically as 1, 2, and 3 were undergraduate students, whereas participants from 4 to 10 were graduate students. Participants' involvement consisted of contributing to an online asynchronous discussion (OAD) over a one-month period. At the end of the one-month period, messages were compiled and printed copies were made of the transcripts of participants' contribution to the discussion. During the study, participants posted a total of 84 messages, four of which were not related to the tasks and consequently excluded from the data. The syntactic unit of a paragraph within a message was chosen to be the unit of analysis for the coders (see Rourke et al., 2001, or Hillman, 1999, for a discussion on choice of unit of analysis).

Coders A and B were graduate research assistants with no prior coding experience. Their training involved one session with the principal investigator of the study, who was also a creator of the instrument. First, the principal investigator explained the instrument and demonstrated the coding procedure to the coders. Then, each coder coded the same portion of one transcript and discussed their coding decisions with the principal investigator to ensure consistent interpretation of the instrument. After the training sessions, the coders coded each transcript independently. The coders coded one transcript each day and each coding session lasted approximately one hour. The protocol adopted for coding limited coders to assigning only one possible code per unit. The total number of paragraphs in all messages posted by the students was 355. The average length of a unit of analysis, or a paragraph within a message, was 97 words. The average number of coded units for each participant was 35.5.

The coders proceeded in three stages paralleling the three hierarchical levels of the coding instrument. With each unit of analysis, coders first decided whether the participant engaged in F (defining the problem) or R (solving the problem). At the second stage, coders were required to determine in which of the processes the participant engaged. Depending on the first coding decision, they had to choose between FD and FB; if the participant engaged in F, and between RI, RE, and RA if s/he engaged in R. Finally, coders had to determine which specific type of behavior was evident in the unit, and which indicator to assign.

Instead of only reporting reliability as one aggregate measure of all coding decisions made during the content analysis, we calculated levels of reliability according to two other variables: tasks and participants. The purpose of using this fine-grained approach was to determine if some variables, such as tasks, result in a lower or higher measure than others, thus affecting the overall reliability value. In order to see how the different numbers of coding categories (two for categories, five for processes, and 19 for indicators) affected the results for the three variables (coders, tasks and participants), we calculated Cohen's kappa coefficients on three different levels. First, we calculated levels of agreement between coders on the basis of a partial one-letter code representing either Problem Formulation (code F) or Resolution (code R) assigned by both coders to every coding unit within the transcript. Then, we calculated the agreement on the basis of a partial two-letter code representing the five processes, such as Defining Problem Space (FD) under the category of Problem Formulation, or Evaluating Solutions (RE) under the category of Problem Resolution. Finally, we calculated the level of agreement on the basis of the complete three-letter code representing the 19 indicators of behavior assigned by both coders. This third level of coding is considered to be final and complete, since it reflects all three levels of engagement in PFR presented in the instrument: whether the behavior evidenced in a particular paragraph was Problem Formulation or Resolution (F or R), which of the five processes was manifested in the unit (FD, FB, RI, RE, or RA), and in which specific PFR behavior the participant engaged, such as FBR or REC.

Cohen's kappa (see Cohen, 1960) was chosen to calculate the levels of agreement over other reliability measures, because it accounts for agreement that is expected to occur by chance. Moreover, it is designed to measure the agreement between exactly two coders, and it can be easily calculated using accessible software. Although kappa has been criticized as being an overly conservative measure, and arbitrary in its determination of chance agreement (see for instance, Brennan and Prediger, 1981; Perreault and Leigh, 1989), it fit the purpose of this analysis. In this study, kappa coefficients were calculated using the Statistical Package for the Social Sciences (SPSS).

Results

The purpose of this study was to identify and illustrate sources of difference in reliability in quantitative content analysis of an OAD. We could choose to report the results as one overall reliability measure for both coders across all eight tasks, 10 participants, 355 units, two categories, five processes, and 19 indicators. This coarse-grained measure would reflect the conventional approach to reporting agreement. In the case of this study, this overall value measured with Cohen's kappa was .591. We could also choose to adopt a more fine-grained approach to reporting the reliability measures. According to this approach, we can consider results, not just as an aggregate measure, but broken down into tasks and participants. When we calculated the results in this way, the mean value of agreement reached by coders on tasks was .539, while the value of agreement coders reached on participants was .707.

Another approach to reporting the reliability measures would be to distinguish between the different levels in the instrument by reporting separate results for the categories, processes, and indicators. Using this approach, we can exclude the indicator from the calculation of agreement, focusing instead on results at the level of the process. For example, instead of considering three-letter codes assigned by coders, which represent the category (letter 1), the process (letter 2), and the indicator (letter 3), such as FDA or RIP, we only focus on the category and the process and exclude the code representing the indicator of behavior (letter 3). In this way, we consider coding decisions on a more general level – we deal with two-letter codes, such as FD and RI and calculate agreement between coders at the level of the process. At this level, the total agreement between the two coders was .724. We can also exclude both the indicator and the process from the calculations. At this level of the category, the total agreement between the coders was .825. Table 1 below provides a summary of the overall kappa coefficients of agreement between Coders A and B at the level of the category, process, and indicator (third column) as well as mean values of agreement across the eight tasks and ten participants at those three levels (fourth and fifth column). Note that the overall reliability value that would typically be reported is .591. In addition, each kappa coefficient indicating a chance-corrected level of agreement between coders is contrasted with a simple percent value of agreement. Although this study is concerned with chance-corrected reliability coefficients, we include the percent values for the readers to note the different results we would have obtained using a measure that does not correct for chance. As well, for each kappa and percent value, the table also presents the number of units on which agreement was reached by the two coders out of a total of 355 units.

Table 1. Summary of Differences in Agreement

		Coders	Tasks	Participants
Categories	*kappa*	.825	.752	.825
	%	91.3	90.7	90.9
	# *of units*	324	322	323
Processes	*kappa*	.724	.636	.738
	%	78.9	78.3	78.9
	# *of units*	280	278	280
Indicators	*kappa*	.591	.539	.707
	%	63	63.4	62.5
	# *of units*	223	225	222

Not only can mean results be calculated and reported at the level of the task, but they can also be considered for individual tasks at the level of the category, process, and indicator. Kappa coefficients for each of the tasks identified numerically from 1 to 8 are presented in Table 2. The total number of units that were posted throughout the discussion for each individual task is also presented. As with Table 1, for each kappa coefficient, a simple percent value of agreement, and the number of units on which coders reached an agreement are also presented. Coding at the most general level of categories produced a range in agreement between Coder A and Coder B, with the lowest value of .455 for Task 7 to the highest value of .914 for Task 6. Coding at the level of the processes produced a range from .773 for Task 1 to .407 for Task 7. Coding at the level of the indicators resulted in agreement between coders ranging from .664 for Task 2 to .349 for Task 6.

Table 2. Summary of Differences in Agreement across Tasks

		Tasks							
		1	2	3	4	5	6	7	8
		Total Units							
		30	49	44	66	35	60	36	35
Categories	*kappa*	.737	.791	.787	.796	.881	.914	.455	.655
	%	90	92	84	94	88	98	89	82
	# *of units*	27	45	37	62	31	59	33	28
Processes	*kappa*	.773	.757	.622	.732	.681	.442	.407	.675
	%	90	84	70	86	71	73	73	76
	# *of units*	27	41	31	57	25	44	27	26
Indicators	*kappa*	.550	.664	.511	.637	.544	.349	.583	.471
	%	63	65	52	72	54	63	70	59
	# *of units*	19	32	23	48	19	38	26	20

Results can be presented for individual tasks, and, as well, for individual participants. Kappa coefficients for each individual participant identified numerically are listed in Table 3. Results are presented for each of the three levels: the category, process, and indicator. The total number of units posted by each participant during the discussion is also presented. Kappa coefficients are contrasted with simple percent values, and the numbers of units in each participant's transcript on which coders reached agreement. Coding at the level of the process resulted in a range from .882 for participant 9 to .536 for participant 3. Coding at the level of the category produced a range from .907 for participant 9 and .390 for participant 3. The highest level of agreement between Coder A and Coder B was reached for participants 2 and 5 with a value of 1.00 (perfect agreement), whereas the lowest agreement was reached for participant 1 and had a value of .668.

Note that the kappa value of 1.00 was achieved even though the percentage of agreement in that case was only 94%. The reason for this discrepancy is that the kappa mechanism would not allow us to calculate agreement when, to code one variable (e.g., Task 1), one coder used a code that the other coder did not. Those unmatched codes were therefore eliminated from the analysis.

Table 3. Summary of Differences in Agreement across Participants

		Participants									
		1	2	3	4	5	6	7	8	9	10
		Total Units									
		31	29	35	40	32	35	55	32	32	34
Categories	*kappa*	.668	1.00	.711	.850	1.00	.828	.766	.749	.875	.810
	%	84	100	85	92	94	94	89	87	94	91
	# of units	26	29	30	37	30	33	49	28	30	31
Processes	*kappa*	.656	.858	.536	.801	.837	.726	.774	.620	.882	.696
	%	74	89	66	85	87	77	84	56	90	76
	# of units	23	26	23	34	28	27	46	18	29	26
Indicators	*kappa*	.638	.853	.390	.702	.891	.668	.714	.596	.907	.706
	%	48	69	46	65	59	68	71	50	75	67
	# of units	15	20	16	26	19	24	39	16	24	23

Discussion

The previous section highlighted a fine-grained approach to the calculation of the coefficient of agreement across a range of valuables. This section of the paper aims to explain and interpret the differences in the reliability values. Prior to considering the results, we briefly discuss perspectives on rating kappa coefficients relying on terms such as high, low, and fair.

In the context of quantitative content analysis, there is no consensus as to what constitutes an acceptable level of interrater reliability (Neuendorf, 2002). As Riffe, Lacy and Fico (1998) report this lack of agreement is due to the different contexts in which the analysis can be conducted. According to Kvalseth (1989), for instance, a kappa coefficient of .61 is an indicator of high agreement, whereas Popping (1988) proposes that a value of .80 represents high overall reliability. After reviewing norms proposed by several methodologists, Neuendorf (2002) concluded that a "coefficient of .90 or greater would be acceptable to all, .80 or greater would be acceptable in most situations, and below that, there exists disagreement" (p. 145). Lombard et al. (2002), however, note that a coefficient of .70 "is often used for exploratory research" and they propose that "more liberal criteria may be used for the indices known to be more conservative" such as Cohen's kappa (p. 593). For the purpose of this study, we adopted a scale developed by Capozzoli, McSweeney and Sinha (1999). The reason why this particular scale was chosen is that instead of providing one number that indicates acceptable reliability, it proposes kappa values that indicate three different levels of agreement: poor, fair to good, and excellent. According to Capozzoli et al.'s scale, values below .40 represent poor agreement beyond chance, values between .40 and .75 represent fair to good agreement beyond chance, and values of .75 and higher indicate excellent agreement beyond chance.

If we had reported the estimates of reliability as an overall measure using the conventional approach to reporting agreement, we would have concluded that the .591 agreement between coders using Capozzoli et al.'s (1999) scale was fair. We chose, however, to provide a more fine-

grained measure of the values across a number of variables. Table 1 illustrates the mean values of agreement across coders, tasks, participants, at the level of the category, process, and indicator. The three highest values (.852, .752, and .825) were achieved at the level of the category for coders, tasks, and participants, and represented excellent agreement. The two lowest values (.591 and .539) were achieved at the level of the indicator for coders and tasks, and represented fair agreement. The third lowest value (.636) was achieved at the level of the process and represented good agreement.

The mean values of agreement between coders presented in Table 1 show that, across participants, the agreement ranged from excellent to good, and across tasks from excellent to fair. This suggests that coders reached higher agreement at the level of the participant than the task. The mean values in Tables 1, however, mask a much broader range in differences in agreement between individual tasks and individual participants. For example, as Table 3 illustrates, at the level of the indicator across ten participants, the values ranged from as low as .390 to as high as .907 or from a poor to excellent agreement. Across tasks, as presented in Table 2, however, the range went from .349 to .664 indicating a range from poor to good. If we compare mean values of agreement between tasks versus participants, we see overall fair agreement in the latter and good to excellent agreement in the former. The range of difference across participants, however, is greater than the range of difference across tasks. These results suggest that coders had more difficulty reaching agreement with tasks than with participants. Compared to the overall value of agreement for all variables, which was .591, the mean agreement of .539 across tasks was slightly lower, although both values represent only fair agreement. Compared to the overall value of .591, the mean value of .707 across participant was higher and represented good agreement.

A more detailed analysis beyond the scope of this study would be needed to explain why such a range of differences might have occurred between individual participants and between individual tasks. We can speculate that certain tasks may have elicited more easily definable behaviors than others. For example, Task 2 was designed to specifically focus participants' attention on defining the problem. In fact, words such as 'understanding' were used in the instruction for that task. As with tasks, coding of some participants' transcripts may have presented more ambiguity to the coders than others. We can note that coding Participant 3's transcript resulted in poor agreement between coders. We might have attributed the low agreement in the coding of this transcript to the fact that this participant was one of the three undergraduate students. Coding of the other two undergraduate students' transcripts, however, yielded good to excellent agreement.

Besides the differences in agreement across tasks and participants, we can observe a wide range of differences across all levels of the instrument – i.e., from the category to the process to the indicator. For example, Table 1 shows that the overall agreement between coders was excellent at the level of the category, agreement for the processes was good, while the agreement for the indicators was fair. Results presented in Table 2 show that agreement was higher on the categories than on the indicators. The mean results across tasks show a decline in agreement as coders move from the category to process to indicators: .752, .636, .539 respectively. Similarly, Table 3 illustrates that agreement across participants decreased as the coders moved from category to process to indicator from .825, to .738, to .707 respectively. These differences may be attributed to different factors. The first of these is the number of coding decisions.

As evidenced in Tables 2 and 3, when the number of coding decisions increased – i.e., when coders had to choose between two categories, then five processes, and then 19 indicators, the level of agreement between coders decreased. We might conclude that the increase in number of coding decision alone was enough to negatively affect agreement between coders. If we take the example of Participant 2 presented in Table 3, however, we can see that this is not the case. For all 29 units in that participant's transcript, the coders agreed 100 percent of the time as to which

of the two categories the manifested behavior should be classified. At the level of the process, the agreement remained excellent, but nonetheless declined. However, if the coders agreed on either Formulation or Resolution, at the next level of the process they did not actually have to choose between five processes, but only two if the unit had been classified as Formulation and three if the unit had been classified as Resolution. Thus, at either level – of the category or the process – there was only a possibility of either two or three decisions. If the number of coding decisions in this case did not influence the difference, we need to consider other factors that may have resulted in a difference in agreement.

One of these factors may be the discriminant capability of the categories, processes and indicators. We can assume that coders were easily able to discriminate between a behavior that represented Formulation (understanding the problem) and Resolution (solving the problem). The fact that the highest values overall were achieved at the level of the category would support this conclusion. On the other hand, they were not as effectively able to discriminate between a behavior that represented Building Knowledge and a behavior that represented Defining the Problem. This may explain why the values for the processes were lower than those for the categories. Difficulties in discriminating between indicators may account for why the reliability values were lowest at the level of the indicator. The decrease in the agreement between coders as they moved from category to process to the indicator may therefore be a result of, not only the increase in the number of coding decisions, but the inability to rely on the instrument to effectively discriminate between behaviors. While some indicators were coded for frequently (e.g., RIP - Proposing Solutions), others (e.g., RER - Rejecting Solutions Judged Unworkable) were used only once.

The higher levels of agreement at the level of the categories suggest that coders were more easily able to discriminate between behaviors related to the categories. This explanation, however, does not account for results obtained for all participants. For example, we can observe that the results for Participant 1 show only a fair agreement of .668 at the level of the categories, meaning that coders were not always able to easily decide whether a behavior manifested the discussant's attempt to either understand or solve the problem. Using the example of one unit from this participant's transcript, we can speculate why there may have been a difference in the choice of category for this unit. In this one unit, which was 110 words long, the participant focused both on understanding and on solving the problem. He specifically uses words such as 'understanding' and 'solution.' A reading of this 110 word unit might therefore suggest to a coder either a focus on understanding the problem and its causes, or on solving the problem. However, because the protocol adopted for coding limited coders to selecting only one code, a choice had to be made between either Formulation or Resolution. In this case, the difference in agreement appears to be due to the lack of discriminant capability of the unit of analysis. If the coders had been able to assign more than one code to a unit, or if the units had been more fine-grained, or a unit of meaning had been selected to conduct coding, coders may have been able to reach an agreement on whether the participant was engaging in Problem Formulation or Resolution. The differences in this instance may be accounted for by the lack of discriminant capability of the unit used for the analysis.

Conclusion

Results of the study reported on in this paper identify and illustrate a variety of sources of difference in agreement that might occur in a particular context of coding an online discussion. In the case chosen for this study, we observe that focus on many variables can provide extensive insight into the intricacies of agreement and lack of agreement that can occur in coding a discussion transcript. The study was limited by its small number of participants and the use of

only one instrument. However, the differences evidenced in this one exploratory case study suggest some areas of investigation that researchers may wish to pursue.

The range in agreement across tasks shown, for example, in Table 2 indicates that, at least in this one case, coders encountered more problems with certain tasks than others. These problems may point to a need for further training focused on understanding and interpreting tasks or prompts in a discussion. As well, problems encountered in coding individual tasks may point to inherent ambiguity in the task itself. Such ambiguity could potentially be addressed by reformulating tasks. Likewise, the range of differences from poor to excellent across participants as presented in Table 3 suggests that training of coders may need to focus specifically on helping them interpret how different individuals communicate in an OAD.

In this case study, the choice of unit of analysis, as well as the discriminant capability of units and items in the instrument, also appeared to play a role in affecting agreement between coders. The choice of unit, as well as the coders' ability to interpret units in the transcript, will likely influence levels of agreement and may need a specific focus prior to coding.

In terms of research in general, future studies might explore the issue of intrarater, in addition to interrater, reliability to gain more insight into the extent to which one coder's interpretation affects the results obtained at two different points in time. In terms of promoting higher reliability in the coding of transcripts, it may be of value to focus specifically on the individual variables where high reliability is achieved in a particular context. For example, we can see that in the case of Participant 2 and 5, with 29 and 32 units respectively, coders reached perfect agreement. Similarly, on Task 6 coders achieved excellent agreement. A specific focus on such instances of high agreement could isolate the factors that contribute to agreement. These, in turn, could be incorporated into either training or instructions for coders. Subsequent studies might account for an explanation of the different levels of reliability for different tasks, codes, and students.

Acknowledgements

This study was made possible by a grant from the Social Sciences and Humanities Research Council of Canada (SSHRC) as well as an external Faculty of Education grant. We would like to thank Dr. Henry Schulz and Dr. Robert Crocker for their advice, and Gerry White for his assistance with calculating the reliability measures.

References

Berelson, B. (1952). *Content analysis in communication research.* New York: Free Press.

Brennan, R. L., and Prediger, D. J. (1981). Coefficient Kappa: Some uses, misuses, and alternatives. *Educational and Psychological Measurement, 41*, 687 – 699.

Capozzoli, M., McSweeney, L., and Sinha, D. (1999). Beyond Kappa: A review of interrater agreement measures. *The Canadian Journal of Statistics, 27*(1), 3 – 23.

Carletta, J. (1996). Assessing Agreement on Classification Tasks: The kappa statistic. *Computational Linguistics, 22*(2), 49 – 54.

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement, 20*(1), 37 – 46.

Crocker, R., and Schulz, H. (2001). *Design of a generalizability study for SAIP assessments.* Report submitted to the Council of Ministers of Education, Canada.

Garrison, D. R., Anderson, T., and Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education, 15*(1), 7 – 23.

Hillman, D. C. A. (1999). A new method for analyzing patterns of interaction. *The American Journal of Distance Education, 13*(2), 37 – 47.

Kanuka, H., and Anderson, T. (1998). Online social interchange, discourse, and knowledge construction. *Journal of Distance Education, 13*(1), 57 – 74.

Kolbe, R. H., and Burnett, M. S. (1991). Content Analysis Research: An examination of applications with directives for improving research reliability and objectivity. *Journal of Consumer Research, 18,* 243 – 250.

Krippendorff, K. (1980). *Content Analysis: An introduction to its methodology.* Beverly Hills, CA.: Sage.

Kvalseth, T. O. (1989). Note on Cohen's kappa. *Psychological Reports, 65,* 223 – 226.

Lombard, M., Snyder-Duch, J., and Bracken, C. C. (2002). Content Analysis in Mass Communication: Assessment and reporting of intercoder reliability. *Human Communication Research, 28,* 587 – 604.

Murphy, E. (2004a). Identifying and measuring problem formulation and resolution in online asynchronous discussions. *Canadian Journal of Learning and Technology, 30*(1), 5 – 20.

Murphy, E. (2004b). Promoting construct validity in instruments for the analysis of transcripts of online asynchronous discussions. *Educational Media International, 41*(4), 346 – 354.

Neuendorf, K. A. (2002). *The Content Analysis Guidebook.* Thousand Oaks, CA.: Sage.

Perreault, W. D. Jr., Leigh, L. E. (1989). Reliability of nominal data based on qualitative judgments. *Journal of Marketing Research, 26,* 135 – 148.

Popping, R. (1988). On agreement indices for nominal data. In W. E. Saris and I. N. Gallhofer (Eds.) *Sociometric Research: Volume 1, data collection and scaling* (90-105). New York: St. Martin's Press.

Potter, W. J., and Levine-Donnerstein, D. (1999). Rethinking validity and reliability in content analysis. *Journal of Applied Communication Research, 27*(3), 258 – 284.

Riffe, D., Lacy, S., and Fico, F. G. (1998). *Analyzing Media Messages: Using quantitative content analysis in research*. Mahwah, NJ.: Lawrence Erlbaum.

Rourke, L., and Anderson, T. (2004). Validity in quantitative content analysis. *Educational Technology Research and Development, 52*(1), 5 – 18.

Rourke, L., Anderson, T., Garrison, D. R., and Archer, W. (2001). Methodological issues in the content analysis of computer conference transcripts. *International Journal of Artificial Intelligence in Education, 12*(1), 8 – 22. Retrieved February 11, 2005 from: http://communitiesofinquiry.com/documents/MethPaperFinal.pdf

Singletary, M. (1994). *Mass Communication Research: Contemporary methods, and applications*. White Plains, NY.: Longman.

Stemler, S. E. (2004). A comparison of consensus, consistency, and measurement approaches to estimating interrater reliability. *Practical Assessment, Research & Evaluation, 9*(4). Retrieved April 7, 2005 from: http://PAREonline.net/getvn.asp?v=9&n=4

Tinsley, H. E., and Weiss, D. J. (1975). Interrater reliability and agreement of subjective judgments. *Journal of Counseling Psychology, 22*, 358 – 376.

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

Book Review – Reflections on Research, Faculty and Leadership in Distance Education

Editor: Michael F. Beaudoin, Oldenburg: Bibliotheks- und Informationssystem der Carl von Ossietzky University, Oldenburg, Germany. Softcover. 141 pages. ISBN: 3 8142 0905 2

Reviewed by: Don Olcott, Jr. Executive Director, Division of Extended Programs and Summer Session, Western Oregon University

Reflections on Research, Faculty and Leadership in Distance Education by Michael Beaudoin is a mandatory, prerequisite resource for any practitioner, researcher, faculty member, and technology manager who are reflecting upon their role in distance education theory and practice. Whether you are new to the field or are an experienced distance education practitioner, this book is a five star read that will provide you with the philosophical and practical base to reflect upon your own view of the field, your work, and the future of distance education in higher education.

Professor Beaudoin draws upon his distinguished career over two decades of serving as a distance education leader, program manager, writer, presenter, faculty member, researcher, and theorist in the field. Moreover, he has adapted a unique and innovative approach to examining a range of critical issues facing the field by reviewing various articles on distance education practice, theory and research that were published between 1991- present to determine if this literature was still relevant today and how (or if) it provides direction and vision to the next evolution of the field. Professor Beaudoin draws upon literature that focused on the state of research practice, the changing roles of faculty, and the status of leadership in the field.

At a time when the "mainstreaming" of distance education with campus instruction is pervasive across higher education, Beaudoin takes a calculated risk in today's ubiquitous information and technology age to suggest that distance education researchers, practitioners, and leaders must pause and reflect on the field, where it's been, where it's going and how we are going to get there. He asks some very candid questions:

- Where is the literature on "leadership" in distance education? Do we, in fact, know very much about effective leadership in distance education and the skills and attributes that the next generation of leaders will need to move the field forward?

- In an era of unprecedented information and research via the Web, is research that was conducted five years obsolete and irrelevant to today's distance education environment?

- Have faculty roles changed due to technology adoption and/or have faculty roles changed because our views and philosophical basis for what constitutes effective teaching and learning changed? Or both?

- Given the accelerated access to information, research, and other resources, is the quality and precision of today's distance education research lacking in terms of methodological and assessment approaches?

- Has the distance education field made a critical error in viewing distance learning as synonymous with "online teaching and learning" only? We have been combining technologies in course delivery for decades, yet today we throw around words like "blended learning" as if we have created this in the past five years.

Distance education is at a crossroads. Professor Beaudoin has insightfully accentuated this point in his book. In many ways he points out what Yogi Berra told us about leadership and change . . . if you don't know where you're going, you're going to end up somewhere else. As the reviewer of this book, I can dispense with "politically correct" jargon and summarize Professor Beaudoin's major points below.

First, the field of distance education does not know where it's going. Perhaps more disconcerting, is that the current generation of practitioners and researchers have a simplistic and irreverent view of previous work and research conducted in the field.

Second, visionary leadership is absent from the field. There's not just a void in the leadership continuum, but the field has failed to draw upon the exponential research and practice on leadership in general to formulate guiding assumptions for leadership in distance education. Today, everyone and no-one is a leader in distance education. In the absence of genuine leadership, people will listen to whomever will step up to the microphone, or in our case, the research journal, the next keynoter, or the next wordsmith who has a new version of an old concept such as "blended learning." Distance learning, distance education, distributed learning, online learning, and the hits just keep on coming. We can't even make up our minds of what to call our field.

Third, today's researchers in the field need to seriously get back to basics. Perhaps most fundamentally, they need to review their literature. I serve on a number of prestigious editorial boards and am mystified to read manuscripts that do not even mention critical research on their particular topic that was done in the past decade by prominent researchers across the globe. This predisposition with "we get to redefine and start all over" because we are the Web generation is doing a disservice to the field and to our colleagues who have contributed to the theory, practice, research, and assessment of distance education.

At a recent conference, a very distinguished faculty member told me that the roles of our best teachers are constantly changing and this was true long before the advent of technology. The best teachers, by nature, are innovative and creative and always searching for better ways to teach, better ways for students to learn, and better ways to measure and assess that the teaching has produced the learning. Perhaps viewed from another perspective, technology does not make average teachers good teachers . . . it makes good teachers great teachers and facilitators.

In summary, I applaud Professor Beaudoin for this exemplary piece of work that should be read by every professional in the field. And, this is not because he has all the answers or solutions nor despite that the book is receiving numerous awards for scholarship. In fact, this book's very admission that the field is not addressing these critical issues and is not formulating new leaders and visions, is not creating new transition models for faculty roles, and has not established new standards for research is the book's inherent value. More importantly, this book does not underscore the important contributions and successes of the field. Professor Beaudoin has provided a thoughtful and illuminating expose of the field in 2004. He, like most us, would like to

ensure that the future leaders of distance education are still writing about the contributions of distance education to higher education in 2024. The choice is ours.

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

Book Review – Distance Education and Technology: Issues and practice

Editors: David Murphy, Ronnie Carr, James Taylor, Wong Tat-meng. (2004). *Distance Education and Technology: Issues and practice.* Open University of Hong Kong Press, Hong Kong Press. ISBN: 9 6277 0747 3

Reviewed by: Erin Keough, Executive Director of Open Learning and Information Network (OLIN), which is located at Memorial University of Newfoundland, Canada.

Distance Education and Technology: Issues and Practice consists of selected readings from the 21st World Conference of the International Council for Open and Distance Education (ICDE) held in Hong Kong in February 2004. The book contains 24 papers and is organized into three sections:

- Issues
- Teaching and Learning with Technology, and
- Innovative Approaches

The first section deals with issues that face practitioners of open and distance learning in the 21st-century setting. It covers topics as diverse as the digital divide as a development issue the comparison of the environmental impacts of face-to-face and distance education, and the challenges of partnerships in this brave new world of transnational distance education. The papers in the second section focus predominantly on various forms of e-learning: "online," "e-," or "m-." There is a range of issues and practices discussed, from a training programme for online tutors, to social presence, to development of identity online. The third section is the shortest, comprising six papers that, for the most part, describe new tools or learning environments to support learners or instructors in the online environment.

The papers are easy to read and are presented in clear, unambiguous style. The layout is pleasing, and each paper is a reasonable length, which facilitates reading ease even in areas that might be somewhat unfamiliar for some. The editors are to be congratulated on achieving this balance, because such balance not always an easy task when dealing with such a wide variety of issues and authors.

For the most part, the papers are reasonably well grounded in their respective literature, although a few are somewhat thin in this regard. While a number of the authors cite literature that was written before the dawn of the world-wide-web, others might have made a more significant contribution if had they likewise done so. Even though these papers deal with various forms of "e-" and/ or on-line learning, the authors would find a wealth of information from scholars and practitioners who worked with older technologies, on how to use interactive technologies to

provide student support, develop a collaborative learning environment that might inform their current practices, and aid in the development of critical thinking skills.

Some highlights of the book, for me, are:

Issues

- Roy, Potter, and Yarrow's approach to measurement of the environmental influence of campus, print, and electronic learning systems, concludes that electronic ODL systems are the most environmentally friendly. Roy and colleagues also include a discussion of possible policy considerations for institutions that must decide which model to use and/ or how they might internationalize their campuses.

- Tysseling's paper builds on previous work of W.H. Chen and B. Willman, and provides an interesting visual model to describe the "onion skins" of five constraints to access (physical, financial, cognitive, content and political), how these "onion skins" interact in relation to one another, and how this visual model can help determine the precise problem effecting access. The author applies a marketing model using this tool to point to ways we can best help redress the problems of the digital divide.

- Bates' paper on myths and realities has the tone of a "keynote" that I am sure will produce many discussions in corridors, coffee houses, and meeting spots. Like all good keynotes, it is open to argument on many points. We will look to Bates' book, mentioned in the paper, to provide further substantiation of his argument and, of course, to other discussions in corridors, coffee houses, and meeting rooms on myths and realities.

Teaching and learning with technology

- Gunawardena's discussion on the application of two stepwise regression analyses, providing insight on the relationship between social presence (literature discussed in the article) and learner satisfaction with online learning.

- Downing and Chin's interesting analysis of the relationship between learning styles (as categorized by Honey and Mumford: activist, reflector, theorist and pragmatist) and satisfaction with the online. Their study shows a statistical correlation between the reflector (online extrovert) style and satisfaction with the online learning environment.

- Kirkwood's management framework for determining the type of multimedia tools (from very simple to very rich) to use in any given setting – a model that will be helpful for those trying to design high quality, cost effective courses that include multimedia.

Innovative approaches

In fairness to the authors in this section, I only took one course in computer programming in the early 90s and quickly decided that it would be best if I just applied progammes that others had developed. The reader must therefore assume I am not that well equipped to analyze this section in depth, so with this proviso in mind:

- Webster's attempt to construct a more flexible LMS is particularly useful, especially given the constraints that many experience with the more commercial products at this stage of their development.

- Ng, Tak-song, and Hoi-Sham's approach to using parse-trees to identify potentially plagiarized material in programming assignments in online courses, promises to be a most useful tool for those teaching IT ad computer courses.

Not unexpectedly, given that this volume is, in essence, a conference proceeding and not a scholarly journal, there is little ground-breaking research here. Some papers present primary research studies, but most are a result of the author's reflection on practice and on literature. A few papers are rather shaky in their arguments but, for the most part, the papers are well presented, argued, and documented. Many offer good insights and tools, and I suspect that readers' responses in most instances will be: "*Hmm interesting. I think that this has broadened my understanding of that area, or I could try to apply that idea in my environment."*

In general, *Distance Education and Technology: Issues and Practice* is good book for practitioners and others looking for concrete examples of application and approach. The three themes give a variety of reading, and will provide something of particular or general interest to most of us practicing in this field.

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

Book Review – Learner Support in Open, Distance and Online Learning Environments

Editors: J. Brindley, C. Walti, and O. Zawacki-Richter (2004). *Learner Support in Open, Distance and Online Learning Environments.* Bibliotheks – und Informationssystem der Universitat Oldenburg. ISBN: 3 8142 0923 0

Reviewed by: Stacey Ludwig, Director of Academic Services, Western Governors University, USA.

There is a growing need for high quality, proactive, learner-centered support services for distance learning students. *Learner-Support in Open, Distance and Online Learning Environments* is the ninth volume in the ASF series on distance education that specifically addresses learner support systems. The text provides an introduction to the current literature encompassing learner support services, as well as a useful introduction to the trends and issues facing learner support practitioners, and implementation and evaluation of practices.

Learner-Support in Open, Distance and Online Learning Environments has 25 contributors providing thoughtful reflection and analyses of the major challenges facing learner support practitioners such as scaling to meet growing student populations, scarce resources, immense technological changes, and greater emphases on learner-centered yet institutionally-connected services. The text is comprised of four sections or units. Unit one focuses on visions and retrospectives. The contributors to unit one provide detailed literature reviews, historical perspectives, and thoughtful reflection on the complexities of providing support services to distance learners. We are reminded that distance learning is more than just a business and that the roles of faculty, students, administrators, and learner support practitioners must change to retain and meet the needs of distance learners. The contributors also address pedagogical issues related to e-learning and the development of courses that are both flexible and collaborative. Unit one is an excellent introduction to the literature relating to learner support systems.

Unit two of *Learner-Support in Open, Distance and Online Learning Environments* focuses on strategies for learner success. The contributors to unit two challenge the traditional notions of learner support by offering rationale for online learner support services, the librarian's role in developing information literacy and critical thinking skills, the use of e-portfolios and learning journals, and the development of learning communities to support the students' connection to the education provider. Unit two contributors also address gender and cultural diversity issues relating to DL environments.

Unit three of *Learner-Support in Open, Distance and Online Learning Environments* focuses on the planning and management of learner support systems. The contributors in unit three introduce complex issues relating to the human resource, systems, training, and project management practices related to designing and implementing learner support services. Unit three also includes in-depth discussions about the quality, effectiveness, efficiency, and flexibility of learner support systems and how to develop research and evaluation systems to measure outcomes. Unit three is a

series of chapters aimed at the more advanced practitioner that encourage the reader to explore the concepts in more detail beyond the scope of the text. Readers get enough information from the text to begin formulating research and evaluation questions related to measuring cost effectiveness and quality of learner support systems.

Unit four of *Learner-Support in Open, Distance and Online Learning Environments* includes three keynote addresses from the 2004 EDEN Conference on Learner Support. A DVD accompanies the text which includes the original recordings of the keynote speeches by Terry Anderson, Nicholas Allen, and Alan Tait, as well as speeches by Otto Peters, Gilly Salmon, and Elsebeth Korsgaard Soerensen.

Overall, I enjoyed the text. The units and chapters are weaved together nicely so that the reader flows from one chapter to the next. Again, I would recommend this text to practitioners that are new to distance learning because it provides an overview of the literature as well as an introduction to the trends and issues. More experienced practitioners will benefit from the review of the recent literature in learner support services, as well as the units covering implementation, research, and evaluation of learner support practices.

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

Technical Evaluation Report

47. Wiki Products: A comparison

Carl Challborn and **Teresa Reimann**
Masters of Distance Education Programme
Athabasca University – Canada's Open University

Abstract

Report #27 in this series discussed the 'wiki' method of online information-sharing, and its educational uses. A wiki is browser-based collaborative writing environment, in which a community may amass and exchange information on a particular topic, and to which anyone may contribute without having Web programming skills. In the current study, seven wikis are reviewed: *EditMe, MediaWiki, seedwiki, Socialtext, Swiki.net,* and *WikkiTikkiTavi/ InterWiki.* The educational potential of each is discussed.

Note: The wiki was devised by programmer Ward Cunningham in 1995, and was named after the "Wiki-Wiki" the rapid shuttle buses at Honolulu airport.

Introduction

Wikis are a set of Web-based software applications that allows visitors to edit and contribute to the content already on the online page. Users access the content from most Web browsers, and no special software is required. Common wiki uses include brainstorming, developing frequently asked questions (FAQs) and responses, collaborative drafting of positions or statements, planning, scheduling, family histories, course materials and projects. Wikis are similar to but distinct from blogs, which may, though do not always, allow visitors to add comments and create an ongoing conversation. Wikis can be limited to doing this alone, but they also have other functions. For example, they can be configured to allow users to change their previous postings: add, edit, delete, etc. Used in this manner, wikis tend to be more collaborative than conversational, with content developed and owned communally by all participants.

Online wiki software does not stand alone. Most basic wiki engines (there are many to choose from) are free, but they need to be coupled with a server/ database. Enhanced features can usually be developed internally or purchased as add-ons. The choice must be made between hosting the wiki site in-house, or having it hosted elsewhere. The use of in-house servers/ databases allows for software customization, but it also demands technical expertise and infrastructure. When using an external wiki host, little technical expertise tends to be required. Some external hosts are free, while others charge for the service. As with email, commercial sites are generally the most reliable. In addition, they often have enhancements to the original open-source wiki engines. Wikis are often grouped by the language used to write them: e.g., Python, Ruby, PHP, LISP, Microsoft, Java or Perl. If the wiki is hosted externally, a distance educator need not be too concerned with the underlying code and can focus more on the features that the product offers. If

the wiki is hosted internally, the selection is limited to the wiki products that are compatible with the server/ database configuration internally used. The familiarity of technical support staff with the different wiki source codes (for customization) may also be a factor. It should be noted, there is no standard markup language for wikis, and that various wikis use different ways of storing their content; so it may be difficult to transport the content of a wiki, hosted on an external server to an in-house server at a later date.

A cautionary note: for the purposes of this review, an attempt was made to install one of the free open-source wikis on a local server. All the necessary software, documentation, and instructions were downloaded. According to the instructions, everything should have been simple and straightforward: but it was neither. After browsing through FAQs, wikis, and blogs for more help, it became clear that many other wiki users have encountered similar problems. After many frustrating hours, the installation effort was abandoned. This experience provides a caution for the average educator. Unless one has special technical expertise or reliable and competent technical support, the average educator is probably advised to choose a wiki that needs no customization. This "off the shelf " product can then be hosted externally on a free or commercial 'wiki-farm.'

Product Trials

1. EditMe

EditMe is one of the most easily used of the wikis tested in this review. It has a clean look-and-feel, is intuitive, and is not intimidating. Because *EditMe* uses "what-you-see-is-what-you-get" (WYSIWYG) formatting, anyone who can use a word-processor will likely feel at home with it. Uploading files is as easy as attaching a file to an email. The product has a separate window for comments beside each workspace. This permits discussions in which the users' names are displayed beside their contributions. *EditMe* is password-protected, records changes to postings, and allows previous postings to be viewed. It has a wide range of features, though these do not allow the same precision of control as in, for example, *Socialtext* or *MediaWiki*. In the latter, for example, the administrator sets permissions for each page, whereas the *EditMe* administrator can only give the user a level of permission that applies across all pages. It is similar with other features such as emailed notification of changes – e.g., one can receive these from *EditMe*, but cannot configure the notifications to occur only if a specific page is altered. It should be noted that *ditMe* does not properly support the *Safari* web browser, and therefore one cannot access many of its features when using *Safari*. *Mozilla* and *Internet Explorer* are the recommended browsers. While some distance educators will need the greater control provided by other wikis, *EditMe* has much to offer and may be the preferred platform for the casual user.

2. MediaWiki

MediaWiki is offered by the non-profit *Wikimedia Foundation*. It is written in PHP and uses MySQL. Although it can be hosted internally for a monthly fee of about US $15/month, commercial operators will also host and maintain a *MediaWiki* site. The product uses the same engine as WikiPedia, DisinfoPedia, WikiQuote, WikiBooks, WikiTravel, and others. It is robust and has proved itself with the public. The markup style is already known to a large number of wiki users. The display is easy to navigate, and it is simple to format text from the toolbar. *MediaWiki* has many features, so teachers must spend some time configuring the settings for specific educational uses. Edits can be tracked and users' contributions recorded in a sidebar. While this feature may be a slight deviation from the collaborative 'ego-less' spirit-of-wiki purists, it can be very useful for educators who need to assess the contribution and participation of individual student users. *MediaWiki* also offers sectional editing, discussion pages separate

from the document working space, unicode support, printable versions of articles, and RSS feeds to inform users of recent changes. It allows administrators to assign different levels of permission by user type and page. For example, certain pages can be locked, while others can only be edited by specific users. This is an important feature for educators who need to protect the content of their students' work from accident or damage by others. *MediaWiki* claims to support uploading of files and images, although this feature was disabled on the demonstration site used for this review. It is reassuring to know that the feature can actually be disabled, for there will be occasions when an educator may wish to prevent unwanted uploads.

3. Seedwiki

Seedwiki is a hosted wiki service that provides a basic account without charge, containing up to three separate wikis and 50 pages in total. A "blue" account, costing US $9.95 per month, provides unlimited wikis and pages, and password protection. A "red" account, at $19.95 per month, provides the above features, plus the ability to create members-only wikis and to use further database options to create customized collaborative applications. The number of users is unlimited regardless of the type of account. The current evaluation tested the free version and found it simple to use, with a large amount of easily accessible support information. The user-friendly controls provide easy registration, password protection of core pages, a user list, and a list of participants currently online. To create a basic *Seedwiki*, one enters the wiki's name, category, and description (e.g., sports), language preference (includes a comprehensive selection), other personal information, and acceptance of the terms of service. The first page of the new wiki is displayed immediately, and all the information needed to work within the wiki. External webpages can be linked, email can be sent, and files (Word, Excel, PowerPoint, etc.) can be attached to any page. The attachment feature allows files to be edited in a forms-compatible browser. *Seedwiki* saves a copy of every page created, allowing users to restore damaged or deleted pages. Clear FAQ information, site map, and a documentation wiki (*Seedwiki* book) are provided. Online help and FAQ are accessible by email and by toll-free telephone. A 'sandbox' is available for testing and practising, and *Seedwiki* developers can be asked for assistance. *Seedwiki* stores its data in unicode, and supports a wide range of fonts and RSS feeds. Cross-platform browser support is available at all subscriber levels. No software download or installation is required.

4. Socialtext

Socialtext is a communication tool geared towards the corporate environment. It is marketed as a secure way to schedule events, manage projects, and share information. After *Socialtext* was adopted as the communication channel, some organisations report increased efficiencies due to the precipitous reduction in group emails. The main attribute distinguishing this product from the others evaluated in this review is the cost. At US $30 per month per user, it is likely to be beyond the reach of typical educational users – even if special non-profit discounts are obtained. *Socialtext* is a good platform for collaborative work, supplying the workplace with both blog and wiki options. This can be disorienting at first, but *Socialtext* provides a fairly good tutorial and help section. It is professional, serious, and secure – highly valued features. It is also easy to use. In less than 30 minutes, the reviewer was fully familiar with the product and set-up an authentic online activity. *Socialtext* then generated passwords so that colleagues could be invited to the site to work on a draft document. Both of the invited individuals successfully logged in, found the document, and added, edited and deleted text. *Socialtext* then provided notification that these changes had been made. Neither colleague had ever used this type of software before or knew anything about wikis.

5. Swiki.net

Swiki.net is a free community wiki service, based on the original WikiWikiWeb concept developed by Ward Cunningham. The easy sign-up procedure involves entry of user's name, email address and demographic information, acceptance of the license agreement, and choice of a login name and password. The procedure takes less than one minute, and no software downloads are required. Creating the actual *Swiki* (seven options) is just as simple, takes less than 30 seconds, and requires no programming skill. Up to 25 MB of documentation can be stored in a *Swiki*, the latest version of which can be accessed from anywhere at anytime. Images can be included in a *Swiki* page, documents can be attached to it, and links created from it. These features permit efficient collaboration, knowledge-sharing, and resource-tracking within user groups. The administrator can control who has password access to individual areas of the *Swiki*, and can revert to a prior version of it if content is accidentally changed or deleted. Account-locking prevents users from editing content. Individual users see only the information to which they have access. Protection against password theft is available, with a rather basic level and amount of online information. Other *Swiki.net* support for is available by email (up to 24-hour turnaround time) or telephone.

6. WikkiTikkiTavi and 7. InterWiki

WikkiTikkiTavi is a 'wiki engine,' a free PHP script that runs wiki sites from a database of wiki pages. The product is named after Rikki Tikki Tavi, the mongoose character in Kipling's jungle stories. The site search and category lists are easy to use. Software includes preferences settings, whereby users can provide personal ID and time-zone for entry in the wiki history, and can change the maximum number of entries displayed in a document's history list. Other features include: variable edit box sizes; a user interface template; table syntax; RSS syndication; support for HTML anchors and references; optional splitting of WikiNames into page titles, headers, and text; macro plug-in features; and a 'sandbox' for practice. Two storage options allow the user to revert to previous or deleted pages: indefinite (all versions of the wiki stored), and transient (versions stored for a specific number of days). Bracketed URL links are automatically generated. The administrator can lock individual pages or the entire site, and can block specific URLs. *WikkiTikkiTavi* is compliant with [XHTML]-Strict specification, using CSS for layout instructions. TaviInstructions are provided for installation and configuration, but are quite confusing if one lacks programming skills. TaviDocumentation and TaviFAQ explain how to use and expand the product. TaviSupport is available at the open source software development site, sourceforge.net.

WikkiTikkiTavi links to *InterWiki*, a system that permits a wiki to be distributed across many servers. *InterWiki* support is provided, and user-defined *InterWiki* entries can be made.

Conclusions

The wiki has clear potential in distance education, allowing users to brainstorm ideas with an unlimited number of people around the world, and to collaborate with them in exchanging files and developing webpages. The evaluation team has been particularly impressed by the comprehensive features pf *Seedwiki*, and has used it to good effect in distance education situations. *EditMe* and *Swiki.net* are good alternatives. *MediaWiki* and *WikkiTikkiTavi* are comprehensive products enabling users to host their own wikis, while *InterWiki* provides a useful distribution service across multiple servers. *Socialtext* is a more costly option designed for collaborative project work in the corporate environment. It is hoped that an increasing number of

educators will encourage their students to develop the simple online editing and sharing skills that make wikis useful.

The next report in the series discusses the use of rubrics and exemplars in online text conferencing.

> **N.B.** Owing to the speed with which Web addresses become outdated, online references are not cited in this report. They are available, together with updates to the current report, at the Athabasca University software evaluation site: http://cde.athabascau.ca/softeval/. Italicized product names in this report can be assumed to be registered industrial or trademarks.

JPB. Series Editor, Technical Evaluation Reports

Athabasca University

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

Technical Evaluation Report

48. Rubrics and Exemplars in Text-Conferencing

Allan Zahara
Athabasca University - Canada's Open University

Abstract

The author draws on his K-12 teaching experiences in analyzing the strengths and weaknesses of asynchronous, text-based conferencing in online education. Issues relating to Web-based versus client-driven systems in computer-mediated conferencing (CMC) are examined. The paper also discusses pedagogical and administrative implications of choosing a synchronous conferencing approach.

Introduction

What are the main pedagogical strengths and weaknesses of asynchronous text-conferencing in Kindergarten to Grade 12 (K-12) education? Since asynchronous methods are the most commonly used forms of online conferencing, the paper will focus less on comparing synchronous and asynchronous modes, than on evaluating asynchronous conferencing in its own right. The author draws upon his experience in developing evaluation criteria and modeling of asynchronous conferencing methods in a group-paced, Grade 12 Political Science course. As indicated in previous reports in this series, successful computer-mediated conferencing (CMC) depends upon a sound pedagogy. Discourse, collaborative, and inquiry-based learning are the pedagogies favoured in the current paper, with dialogue as the common thread in all of these approaches. As Rorty (1980) suggests, we should see "conversation as the ultimate context within which knowledge is to be understood."

In the form of Web-based discussion/ bulletin boards, asynchronous CMC has been in use long enough in the K-12 environment for us to recognize that it presents new opportunities and challenges. The most exciting potential lies in the expansion of opportunities for students to overcome the constraints of the traditional classroom, time, space, and access to information and experts. In addition, students gain opportunities to record, develop, and refine their knowledge in a structured database, as part of a community of online learners such as The Knowledge Forum. Nevertheless, distinct problems have emerged in the use of discussion boards. The following observations, though derived from the post-secondary environment, are confirmed by the author's K-12 experiences.

> *[M]*any current dialogical approaches to computer-supported collaborative learning (CSCL). . . use generic 'off the shelf' computer-mediated communication (CMC) systems. Hence, these approaches tend to be technology-led, and take virtually no account of the importance of pragmatic level features. Instead, these systems operate as mere conduits of dialogue, and fail to provide the structure,

management, and guidance that is often necessary to support and mediate effective educational collaboration. Further, it has been noted that online tutors at the UK Open University and elsewhere consistently comment that using generic CMC systems is problematic. They point out that these systems often encourage educational discourse that is superficial (e.g., incoherent and with no agreed closure), ambiguous (e.g., lack of shared meanings and little appreciation of different points of view) or simply unmanageable (e.g., too many contributors and too much dialogue) (Ritchie and Peters, 2001).

CMC Rubrics and Exemplars

Part of the solution to CMC problems is to ensure an adequate structure for the CMC assignment, with clear expectations and criteria for evaluating student performance. Useful tools include carefully designed rubrics for the evaluation of student contributions, and the study of exemplars of successful previous work. Rubrics are best developed with the students themselves. As conferencing participants, they should learn to differentiate between research postings, which provide data in the form of facts and expert opinion, and discussion postings, which involve the negotiation of meaning between participants. Both data and discourse are essential to the pedagogical framework, and therefore need to be explicitly examined prior to student involvement. The rubric is a useful tool for achieving this level of understanding. Exemplars provide students who may have difficulty moving beyond rote learning to knowledge as discourse, with participation models.

Careful structuring of time is important to the success of asynchronous CMC. In contrast with synchronous CMC modes, the asynchronous mode usually provides extra time in which to compose thoughts, and classroom momentum should be encouraged to sustain interest and opportunities for meaningful interchange. The author has found that short assignments or assignment segments, with a 36-72 hour window for short discourse-based inquiry, strikes an effective balance with the flexibility that students' value in conducting online learning activities.

The authenticity of the learning task is also essential to creating an engaging CMC learning opportunity. This means grounding assignments in topics which are meaningful to the students and significant beyond the classroom. Inquiry-based learning is a means of achieving this. Students can be engaged in directed research relating to their own agenda. This has been successfully combined with collaborative discourse in CMC through the use of 'cooperation scripts' (Hron and Friedrich, 2003). These inquiry-based sentence fragments or 'learning stems' are used to focus collaboration and are built into the CMC tool. Useful examples include: "How do you know that . . . " and "My theory is . . ."(Knowledge Forum, 2003). The goal is to provide an adequate balance between structure and student-directed discourse and inquiry.

These principles are applied in structured CMC activities including the Facilitation of Dialogue Games (Ritchie, 2001). This approach uses game theory to structure guided student inquiry, in dialogue with a teacher/ tutor/ facilitator: "Within this game, the student is questioned and encouraged to express their understanding of a domain and to refine this in response to the tutor-system reasoning about the learner's explanations examining their completeness, consistency and generality, and consequently challenging, critiquing, and probing the student's explanatory model" (Ritchie, 2001). Another means of adding authenticity to CMC is to include 'tele-mentors' or experts who are brought virtually into the classroom to assist student inquiry. In collaborative or individual inquiry, students are assisted by an expert mentor who guides them through a defined inquiry process (O'Neill, 2000). Klemm (1999) suggests a checklist for the successful moderation of CMC that uses such approaches:

1) Require participation

2) Form learning teams

3) Make the activity interesting

4) Don't settle for just opinions

5) Structure the activity

6) Require a hand-in assignment (deliverable)

7) Know what you are looking for, and involve yourself to help make it happen

8) Peer grading

Tasks of CMC Participants

Hron and Friedrich (2003) describe the different functions played by the teacher/ moderator/ facilitator. The moderation functions listed in Figure 1 include organization, motivation, expertise, and didactics. This taxonomy is useful in pointing out that expertise is far from being the only criterion for successful teaching in this relatively new medium.

Figure 1. CMC moderator functions (after Hron and Friedrich, 2003)

Organisation function	Motivation function	Expert function	Didactical function
• Give an overview about the course, make relations between instructional media (print, CBT) and learning forms (group and individual work). • Specify goals for course episodes. • Support formation of groups. • Open and terminate course episodes. • Plan meta communication, e.g. evaluation of the course by the learners themselves. • Inform about performance record and grading.	• Support social presence, e.g. by introduction turns. • Create discussion-favourable climate, e.g. by welcome messages, and encouragement. • Give feedback, e.g. react immediately to each first contribution. • Induce commitment, specify communicative minimum requirements (e.g. minimum number of logins), introduce *netiquette*. • Stimulate curiosity and cognitive conflict, e.g. raise questions, present contradictory positions.	• Supervise suitability of contents and materials regarding curricular goals. • Affect topics according to curricular goals. • Enter additional contents and materials. • Establish subject matter relationships between topics and learning groups. • Make sure that materials are suitably used.	• Give introducing hints / processing assistance for topics. • Stimulate summing up of complex topics or give summaries. • Ask comprehension questions. • Subdivide a range of topics into subtasks, which can be cooperatively worked upon.

Consideration of the learners' characteristics is crucial to good CMC teaching. Sabry and Baldwin (2003) describe the influence of CMC on learning styles as follows.

> Providing a variety of asynchronous interactions through, for example, the use of discussion (bulletin) board for different activities such as different group assignments, discussions, brainstorming, activities and problem solving exercises can help Sequential learners to get involved in a progressive manner and be able to see the development of the argument, while also giving opportunities for

> Global learners to obtain a holistic view of the discussion through the linking of different discussions to subject topics that constitute the whole (Sabry and Baldwin, 2003).

K-12 educators must increasingly consider not just learning style differences, but also the challenges of learning in a second language. Young (2003) found an increased willingness to use a second language through the lessening of 'psychological barriers' in asynchronous CMC activities. Although grammar and vocabulary were not notably improved, students demonstrated increased critical thinking and problem-solving skills. These positive effects may be related to the effects of asynchronous CMC noted by Hron and Friedrich (2003) - e.g., being able to compose a message 'in peace,' the existence of a long term record for reference, and the absence of social cues requiring appropriate timing, as in face-to-face communication. As K-12 educational researchers and practitioners move from the present early stages of combining sophisticated pedagogy with next-generation CMC, a systematic approach to design, application, evaluation, and feedback will be required. As Ravenscroft and Matheson (2002) indicate:

> . . . the aim is a much closer fit between empirical research, design, implementation and evaluation in educational technology research and development, that has direct implications for designing tools supporting (CMC) . . . The research is considering pedagogy, technology and dialogue context in the design of educational interactions, in ways that treat designs, like theories, as something that are developed, evaluated and refined rather than 'delivered' *(Ravenscroft and Matheson, 2002).*

References

Hron, A., and Friedrich, H. (2003). A review of web-based collaborative learning: factors beyond technology. *Journal of Computer Assisted Learning, 19*(1), 70 – 79.

Klemm, W. (1999). Eight ways to get students more engaged in on-line conferences. *Journal of Higher Education, 26*(1), 62 – 64.

Knowledge Forum (2003). *Introducing Knowledge Forum 4.5 for Elementary, Middle School, High School, and Professional Development.* Retrieved June 15, 2005 from: http://www.knowledgeforum.com/K-12/k12.htm

O'Neill, K., Abeygunawardena, H., Perris, K., and Punja, Z. (2000). *The Telementor's Guidebook: A field manual for supporting student inquiry on-line.* Retrieved June 15, 2005 from: http://www.stanford.edu/class/educ298/2002/ONeill-telementoring.pdf

Ravenscroft. A., and Matheson, M. (2002). Developing and evaluating dialogue games for collaborative e-learning. *Journal of Computer Assisted Learning, 18*(1), 93.

Ritchie, G., and Peters, S. (2001). Using narratives in conferences to improve the CMC learning environment. *Journal of Computer Assisted Learning, 17*(4), 376.

Rorty, R. (1980). *Philosophy and the Mirror of Nature.* Oxford: Blackwell.

Sabry, K., and Baldwin, L. (2003). Web-based interaction and learning styles. British *Journal of Educational Technology, 34*(4), 443 – 454.

Young, S. (2003). Integrating ICT into second language education in a vocational high school. *Journal of Computer Assisted Learning, 19*(4), 447 – 461.

The next report in the series discusses the role of instructional design in learning object development.

> **N.B.** Owing to the speed with which Web addresses are changed, the online references cited in this report may be outdated. They can be checked at the Athabasca University software evaluation site: http://cde.athabascau.ca/softeval/. Italicised product names in this report can be assumed to be registered trademarks.

JPB. Series Editor, Technical Evaluation Reports

Athabasca University

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

Technical Evaluation Report

49. Learning Objects and Instructional Design

Brian Harvey
Masters of Distance Education Programme
Athabasca University – Canada's Open University

Abstract

Reusable learning objects are an approach that is receiving a significant amount of attention in distance-based and online education (see Reports # 11, 40, and 46 in this series). They have the potential to provide cost-effective, personalised instruction with a short development time. Instructional design principles, however, must play an important part in any such development effort, within a design process that occurs on two levels. At the higher level, instruction must be designed to deliver material efficiently to students at the modular/ course/ programme level. Design principles should be applied at the secondary level, at which the unique characteristics of learning objects are determined. Various instructional design (ID) methodologies are capable of dealing with these issues. The current report discusses a sle of these methodologies, and compares the ID adequacy of objects in four major learning object repositories: *Merlot*, *CLOE*, *EOE*, and *Wisconsin Online*. At the time of writing, each of these repositories contains objects that are inadequate from the ID point of view.

Instructional Design Requirements of Learning Objects

For a learning object (LO) to have instructional impact, it must embody explicit planning for learning, intentional instructional design (ID). Solid ID is a critical part of reusable LO design (Longmire, 2000; Wiley, 2000; Douglas, 2001; and Sosteric and Hesemeier, 2002). For the purposes of the current review, it will be assumed that the term LO refers to a digital entity intended to further the achievement of a specific learning objective. This working definition discounts those LOs that generate learning serendipitously, and could restrict the review to LOs in computer-based environments. Digital entities, whose primary purpose in a given context are to provide information, will be referred to as content objects (CO). Depending upon the context, a CO may become a LO or may serve as a LO component.

LOs typically comprise two different major components that may, or may not be, co-resident on the same computer – the learning content and the metadata. Both of these LO aspects must be considered during the ID process for the object to be effective. The metadata provide the learning context for the LO, and are the key to its *reusability*. The prime requirement of a LO is that it is reusable in different contexts (Sicilia and Garcia, 2003), and specifically in each of its target contexts as defined in the metadata. The *granularity* of an LO is defined as its instructional size, a characteristic hotly debated among LO advocates (Wiley, 2000). As learning objectives may be

needed at different levels of a course or programme, each combining different lower-level enabling objectives, so too a LO can be defined as material capable of assisting a higher-level learning objective, comprising lower-level LOs defined to achieve enabling objectives. From the ID perspective, it is the scope of the learning objective that is important in the definition of LO granularity. The smaller the granularity, and the finer the objective the LO is designed to achieve, the greater the LO's reusability, for the object will be applicable across a greater number of learning contexts and adaptable to different learner characteristics. Lesser granularity permits the LO's use in an environment where LOs can be moved in and out of the learning system in response to changes in learner type. Reduced granularity, however, increases cost and management difficulty (Herridge Group, 2002).

For a LO to be reusable across multiple learning contexts, it must also be able to stand on its own. For the LO to serve different objectives in different instructional contexts, it must be independent of the position in which it is placed in the larger learning environment. If a LO is dependent upon other objects that appear before or after it in the learning sequence, it cannot achieve a learning objective in its own right. It is therefore not an LO at all, but is – at best – an asset in the structure of a larger LO, perhaps involving other LOs that are necessary to the achievement of the learning objective. The LO's ability to be used in different technological environments enhances its reusability; efforts must be made during the LO's development to maintain its independence of any particular hardware or software environment, including the use of specialised plug-ins. Such technological dependencies should be recorded in the LO's metadata. To accomplish all of these objectives, it may be necessary to adjust the ID methodology used.

Instructional Design Overview

Instructional design (ID) is "the systematic and reflective process of translating principles of learning and instruction into plans for instructional materials, activities, information resources, and evaluation" (Smith and Ragan, 1999). Instruction is normally regarded as a system of interdependent elements that facilitate intentional learning (Gagné, Wager, Golas, and Keller, 2005; Reiser and Dempsey, 2002). ID methodologies can be applied at many levels, from the development of entire curricula, to that of the activities for a single lesson. It can represent the work of an individual or of a team of specialists. ID models are usually represented as a sequence of iterative processes, often requiring a number of cycles, before the product is fully refined. Depending upon the complexity of the instruction, however, ID may be better represented as a tightly interwoven knot than as a linear sequence of processes. This interwoven nature is particularly evident in those designs produced by rapid prototyping techniques (Smith and Ragan, 1999). In such cases, care must be taken to ensure the adequate completion of each stage before the start of the next; otherwise critical information may be missing from the material, resulting in learning errors.

The generic form of ID, found at the core of most current models, is the ADDIE model – Analysis, Design, Development, Implementation, and Evaluation (Gagné, Wager, Golas, and Keller, 2005; Reiser and Dempsey, 2002). This model focuses on learner performance relating to real-world tasks, and makes no assumption that a live teacher is necessary (Reiser and Dempsey, 2002). These characteristics make the ADDIE model appropriate as a starting point for the development of online learning and, specifically, LOs. Other methodologies have been proposed for the development and use of LOs, though have not differed essentially from the basic ID model (Martinez, 2000; Herridge Group, 2002; IMS, 2003; Downes, 2003; Johnson, 2003). LO design and development has two stages: the development of the LOs themselves, and their organisation into large aggregations, whether larger objects, modules, or courses. Most writers deal with the

aggregation of existing LOs rather than with the development of original LOs. ID principles can apply to either level. Johnson (2003) suggests that LOs should be developed according to approaches that ensure the appropriate application of sound ID strategies, enforcing clearly defined quality standards. A clear learning intent must be associated with a LO, and such intent cannot be made consistently evident in the absence of a comprehensive and systematic ID process. Martinez (2000) suggests that ID principles that result in better instruction have been avoided by LO designers, largely because of lack of familiarity with them. She questions the instructional value of LOs developed without due attention to major ID concepts. As metadata standards evolve, it is to be hoped they will become capable of including more ID information.

A Comparison of LO Requirements

The design considerations of a LO first arise at the initial analysis stage, at which the characteristics of the learners are determined, and the contexts in which they will learn. Analysis must consider the students' ability to learn effectively using online education, and the extent to which they will be able to endure visual and design differences among LOs brought together from disparate sources. Learner characteristics should be clearly indicated in the LO's metadata, since this will affect the appropriate reuse of the LO. In designing a monolithic course or module, learning objectives are defined in terms of "the skills to be learned, the conditions under which the skills must be performed, and the criteria for successful performance" (Dick, Carey, and Carey, 2001). To make these objectives appropriate for the development of LOs, they must be broken down into more detailed enabling objectives facilitating the development of information LOs and lower-level LOs. During the development of the instructional strategy, the specific design of the LO must be addressed. The manner in which learners will be presented with the instruction is determined (the delivery media and learning activities), and the sequencing and aggregation of objectives. These tasks must be completed whether the designer is developing an entire course or individual LOs. The size of each LO must be decided and its reusability weighed against the applicability of the LO in the instructional context. Smaller LOs can be aggregated into larger granularity LOs, though this may involve greater management costs. Wiley (2000) and Dick, Carey, and Carey (2001) have each recommended consideration of Gagné's nine events of instruction during the development of an instructional strategy.

A further consideration when developing an instructional strategy appropriate to the use of LOs is that multiple approaches to the instruction may be necessary to account for an LO's use in multiple contexts with multiple learning styles. For exle, an LO may include video, audio, and textual treatments of certain material to assist those students who learn best from one or another of these media. During the development of instructional materials for traditional classroom delivery, both student and instructor materials may be developed. Student materials will contain a summary of the knowledge to be acquired, and instructor materials will provide elaborative information. In developing online learning materials, however, such a division of information may not be appropriate. In the development of LOs specifically, the developer may have no knowledge of their ultimate usage, and must therefore make the information contained within the object as complete and context-free as possible, without sacrificing effectiveness. Such broad applicability implies a strong organisation of information, and the likely use of multiple media to ensure that the LO is independent of external requirements.

In order to enhance its transferability to multiple contexts, development of an effective LO also involves serious consideration of human-computer interface issues (Cassarino, 2003). Formative and summative evaluation of LOs and their aggregation can be carried out as in traditional teaching contexts. While traditional course materials can be evaluated in the context for which

they were originally designed, LOs need to be evaluated in multiple contexts. Since the original designer cannot anticipate all of the contexts in which an LO will be used, evaluative data may need to be obtained from designers who have included the LO in other learning situations. General metadata standards do not include fields for feedback of this type, though some LO repositories (e.g., Merlot, *see below*) have added this feature to their structure.

LO Repositories and ID Principles

Though it is often difficult to determine if ID standards have been deliberately applied to a particular piece of instructional material, objects contained in content repositories can be assessed in terms of their adherence to specific ID principles. In particular, the following questions can be asked of the individual items in an object repository: Do they facilitate intentional achievement of specific instructional objectives? Or are they merely COs, supplying basic information only and needing to be combined with other objects to facilitate intentional learning? The object's ease of use, navigability, and reusability can be assessed by reviewing its interface and the extent to which it is tied to a particular learning context.

1. Merlot Multimedia Educational Resource for Learning and Online Teaching

Merlot Multimedia Educational Resource for Learning and Online Teaching (*http://www.merlot.org*) is a major international repository administered by a consortium of higher education institutions, and contains objects on a broad spectrum of disciplines. Objects added to the repository are open for peer review, which are made available to visitors along with the metadata that assist in assessing the applicability of an object for specific purposes. The objects are not actually contained within the repository, and it is often difficult to contact their source sites. This reviewer surveyed the first 20 objects presented in *Merlot*'s Business category, listed with reference to peer ratings. Of these, nine were content objects (COs) that would need to be combined with other instructionally specific objects in order to supply the learners with both context and intent. Only eight objects could be classified as actual LOs, four of which appeared to be widely reusable, though only as whole topics owing to their granularity. Many of the object sites were commercial, containing information provided primarily as a means to sell another product or service. A scan of objects listed further down the list in the Business category revealed many other commercial sites presenting COs with apparent limited reusability.

2. CLOE Cooperative Learning Object Exchange

CLOE Cooperative Learning Object Exchange (*http://cloe.on.ca*) is a repository at the University of Waterloo containing peer reviewed LOs. All objects in the repository undergo peer review before being posted. Their metadata are available, but the results of the peer reviews are not. This restricts the formative evaluation of an object by other than its original creators. *CLOE* is a small repository, so the current object review was cross-disciplinary. Of the 12 objects reviewed, seven were classifiable as COs, requiring other information in order to produce intended learning. Four were full-topic, stand alone LOs with definitions of objectives, content presentation, and assessment. One object was unavailable, an unexpected problem given that the objects are all housed within the repository database. None of the objects were simple graphic assets as with the image files found in some repositories. All were self-contained and would be highly reusable in appropriate contexts. Their metadata were not always complete, and a potential user would need

to review each object in turn to find adequate comparative information. Overall, the quality of materials in this repository appears to be higher than that found in *Merlot*.

3. EOE Electronic Object Economy

EOE Electronic Object Economy (http://www.eoe.org) is a LO repository containing Java-based objects. Objects in other repositories may be developed using this programming environment, and the repository is distinctive in that, except for the HTML shells surrounding the Java applets, no other technologies are used. The Business category of objects was again chosen for review, and eight objects were selected for assessment. Of these, two were inelegant, but functional and reusable objects incorporating simple Java applets for performing calculations. While attempting to navigate to one object that claimed to calculate amortisation schedules, the evaluator was redirected to a pornography site. The remaining sites were unavailable. The review was terminated at this point since the search was totally unproductive.

4. WORC Wisconsin Online Resource Center

WORC Wisconsin Online Resource Center (http://www.wisc-online.com) is a collection of Flash-based COs. Each is short and only occasionally provides complete topic coverage. Six objects were reviewed in the Business category. Each displayed a consistent interface that would assist their seamless integration into a comprehensive course. For most purposes, however, they are unlikely to stand on their own.

Conclusions

Reusable LOs can be effective in the delivery of cost-effective, timely, reusable instructional materials. Their effectiveness, however, is as much a product of efficient instructional design as any learning materials or process; and ID principles should addressed during the objects' design and development. The ID principles proposed for use in object-oriented situations are essentially the same as those used in the development of traditional instructional materials. They should be applied not only in the design and development of modules and courses using LOs, but also in the creation of the objects themselves.

A survey of objects contained in existing repositories, however, reveals that relatively few can strictly be defined as LOs at all, being of a basic CO type and not useable on a stand-alone basis to bring about intentional learning. These objects need to be aggregated with other materials in order to achieve specific objectives. Their quality also varies greatly, and in some cases calls into question the professionalism associated with the learning materials of which they are a part. The current review indicates that the effective development of LOs requires the clear definition of an instructional process addressing the unique characteristics of LO technologies, within the structured process stressed by ID principles. If such principles are not heeded, learning repositories will gain a reputation for amateurish content, rather than credibility as worthwhile educational resources.

References

Cassarino, C. (2003). Instructional Design Principles for an eLearning Environment: Acall for definitions in the field. *The Quarterly Review of Distance Education, 4*(4), 455 – 461.

Dick, W., Carey, L., and Carey, J. O. (2001). *The systematic design of instruction* (5th Edition). Toronto: Addison-Wesley Educational Publishers Inc.

Douglas, I. (2001). *Instructional Design Based on Reusable Learning Objects: Applying lessons of object-oriented software engineering to learning systems design.* Retrieved June 15, 2005 from: http://fie.engrng.pitt.edu/fie2001/papers/1118.pdf

Downes, S. (2003). *Design, standards, and reusability.* Retrieved June 15, 2005 from: http://www.downes.ca/cgi-bin/website/view.cgi?dbs=Article&key=1059622263

Gagné, R. M., Wager, W. W., Golas, K. C., and Keller, J. M. (2005). *Principles of Instructional Design.* Belmont, CA.: Wadsworth/ Thomson Learning.

Herridge Group (2002). *Learning objects and instructional design.* Retrieved June 15, 2005 from: http://www.herridgegroup.com/articles_reports.html

IMS Global Learning Consortium (2003). *IMS Learning Design Best Practice & Implementation Guide.* Retrieved June 15, 2005 from: http://www.imsglobal.org/learningdesign/index.html

Johnson, L. F. (2003). *Elusive Vision: Challenges impeding the learning object economy.* Retrieved June 15, 2005 from: http://www.macromedia.com/resources/elearning/objects/

Longmire, W. (2000). A primer on learning objects. *ASTD Learning Circuits.* Retrieved June 15, 2005 from: http://www.learningcircuits.org/2000/mar2000/Longmire.htm

Martinez, M. (2000). Designing learning objects to personalize learning. In *The Instructional Use of Learning* Objects (Chapter 3.1). Retrieved June 15, 2005 from: http://www.reusability.org/read/chapters/martinez.doc

Reiser, R. A., and Dempsey, J. V. (2002). *Trends and issues in instructional design and technology*. Toronto: Pearson Education.

Sicilia, M. A., and Garcia, E. (2003). On the concepts of usability and reusability of learning objects. *International Review of Research in Open and Distance Learning, 3*(2). Retrieved June 15, 2005 from: http://www.irrodl.org/content/v4.2/sicilia-garcia.html

Smith, P., and Ragan, T. J. (1999). *Instructional Design* (2nd Edition). New York: Wiley & Sons.

Sosteric, M., and Hesemeier, S. (2002). When is a Learning Object not an Object: A first step towards a theory of learning objects. *International Review of Research in Open and Distance Learning, 3*(2). Retrieved June 15, 2005 from: http://www.irrodl.org/content/v3.2/soc-hes.html

Wiley, D. A. (2000). Connecting learning objects to instructional design theory: A definition, a metaphor, and a taxonomy. *The Instructional Use of Learning Objects*. Retrieved June 15 2005 from: http://www.reusability.org/read/chapters/wiley.doc

The next report in the series discusses techniques for optimizing conferencing freeware.

N.B. Owing to the speed with which Web addresses are changed, the online references cited in this report may be outdated. They can be checked at the Athabasca University software evaluation site: http://cde.athabascau.ca/softeval/. Italicised product names in this report can be assumed to be registered trademarks.

JPB. Series Editor, Technical Evaluation Report

Athabasca University

International Review of Research in Open and Distance Learning
Volume 6, Number 2. *ISSN: 1492-3831*

July – 2005

Technical Evaluation Report

50. Optimizing Conferencing Freeware

Jon Baggaley, Professor
Athabasca University – Canada's Open University

Jim Klaas, **Norine Wark,** and **Jim Depow**
Masters of Distance Education Programme
Athabasca University – Canada's Open University

Abstract

The increasing range of options provided by two popular conferencing freeware products, *Yahoo Messenger* and *MSN Messenger*, are discussed. Each tool contains features designed primarily for entertainment purposes, which can be customized for use in online education. This report provides suggestions for optimizing the educational potential of the two products: e.g., generating automated statements for conference moderators to use in controlling conference sessions, and for all participants to use in overcoming the high-bandwidth obstacle of online video transmission.

Introduction

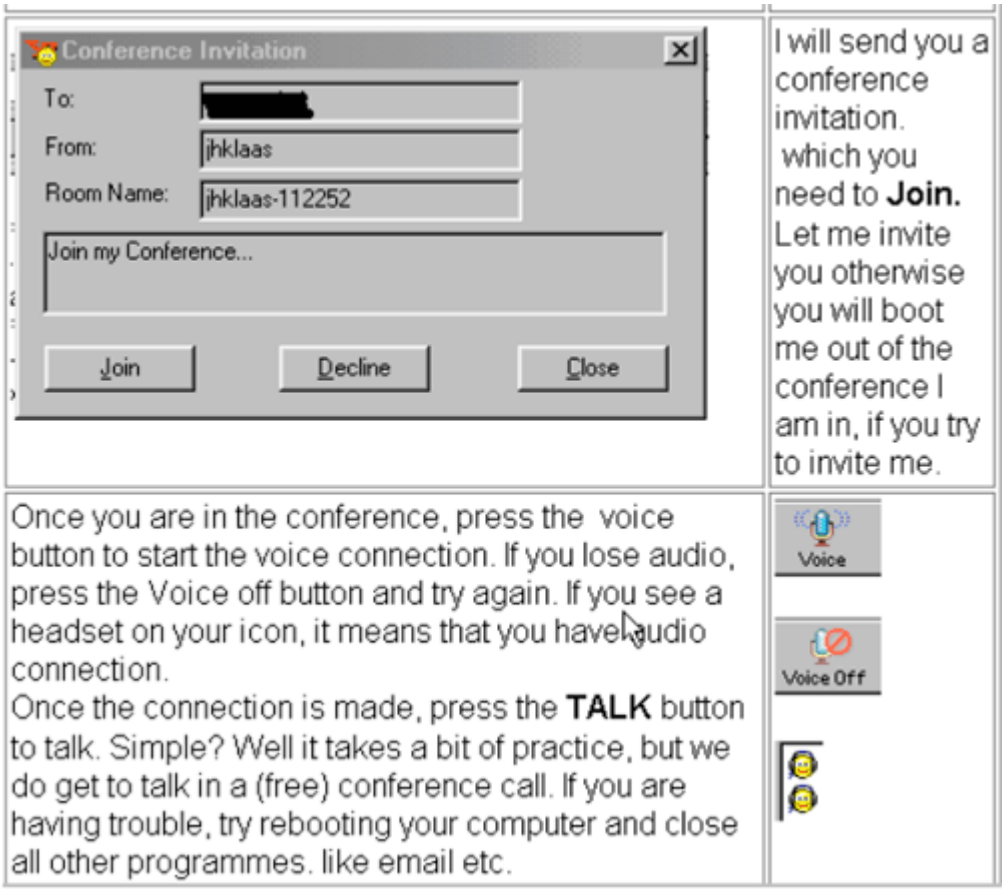
Earlier in this series (see Report #21), the authors summarized the wide range of software tools available for online collaborative work, with emphasis on conferencing techniques (text/ audio/ video), whiteboard, and polling tools. The increasing integration of these techniques within course delivery systems was discussed, and the technical and didactic procedures that moderators of online conferences should follow prior to, during, and after a session. In the two years since (2003-05), the flexibility of collaborative software has expanded significantly, with notable developments in freeware messaging tools. Other reports in the series (e.g., # 4, 6, 15, 18, 35, 45) have indicated that the most popular messaging tool among distance education (DE) students is *Yahoo Messenger (YM)*. This software combines audio, video, and text-chat features within a free and easily installed download package, and has recently acquired mobile telephone integration and automated entertainment functions. *MSN Messenger* (*MSNM*), discussed in reports # 6, 14, has developed similar features since our 2003 review, and its use among the authors' DE students and colleagues is increasing substantially, owing to its inclusion in *Microsoft*'s standard *Windows* packages. Each of these tools now has the flexibility previously only available in costly commercial products. The current report discusses a set of freeware messaging features of particular use in DE, and ways in which they can be harnessed in order to optimize these products' educational value.

Online Messaging Features

1. Automated access

A major obstacle to the adoption of online conferencing methods in distance education is the fact that teachers need (or think they need) new technical skills in order to master the techniques and to teach their students to do so. Ideally, online conferencing facilities should be continually available, without the need for advance planning, and 'turnkey-ready' (i.e., activated via minimal keystrokes). *Yahoo Chat*, the audio-conferencing feature of *YM*, is available in a useful Web-based version, which enables users to create and enter conference rooms through their web browsers (http://chat.yahoo.com/), whether or not on the computer on which the user's own YM software is installed. The Web-based version streamlines the login procedure, though is marred by the numerous, often distasteful chat rooms encountered in navigating to the conference of one's choice. The login process can be further simplified by adding specialized *YM* coding to one's own website, thereby providing access by a simple click on a *YM* icon. Microsoft's comparable product (MSN Chat) has recently moved to a paid subscription basis, ostensibly in order to control and clean up its chat room content. The development of rapid, 'turnkey,' and cost-free methods for accessing the *YM* and *MSN* facilities is clearly still a 'work in progress.' Meanwhile, distance education teachers and support staff can streamline students' access to online conferences by developing specialized websites including instructions such as those shown in Figure 1. For example, these should include details of how to use the *YM* 'audio setup wizard'

Figure 1. Sample online instructions for conference participants



2. Automated moderator statements

Once participants have gathered in an online conference room, the *YM* and *MSN* projects both provide an expanding range of features that teachers can customize for educational purposes. For example, commercial conferencing packages typically provide a range of automated options for use in determining the order of speakers (e.g., a 'hands-up' option to indicate the wish to speak). Such moderator control features can be created free of charge in *YM*, by modifying the 'emote' options, by which conference participants can send automated statements to one another in the conference text-box by a simple click on a menu item ("X smiles at Y"; "Z laughs out loud"; etc.). Since the program code for the 'emote' feature resides on the user's own computer, it can be customized to generate specialized statements for use in educational settings. This automation reduces the complexity of tasks required of the moderator, in the effort to control the sequence of conference events while also joining in the conversation. Even with this level of automation, many moderators will still find the control process complex, at least initially, and may prefer to allocate a member of the conference group to serve as technical assistant for some of the automated functions. The customized commands used in conferences run by the first author (JB) are shown in Appendix I.

3. Automated video cues

Accessibility, slow dial-up speeds, and inadequate computer memory will continue to be a hurdle for many online students for the indefinite future, particularly in developing countries. *YM* users can engage in audio conferences with RAM memory as low as 128K, whereas more expensive software packages can require at least twice that amount. The Web-camera features provided with many conferencing packages; this, however, place excessive demands on low-end computer systems, and are simply not an option for many students. In this situation, the automated graphic features of *YM* and *MSNM* provide useful alternatives to video transmission. The cartoon faces of the products' 'emoticon' features can be customized in much the same way as the automated 'emote' statements described in the previous section. Smiling and frowning faces can be replaced by participant photographs, and inserted into the conference text-box by clicking on the appropriate menu item. For example:

The latest edition of *MSNM* (v.7) provides a simple graphic upload facility for this purpose. In the current edition of YM (v.7), the new image files should be saved on the hard drive as 18 x 18 pixel .gif files, at: c:\Program_Files\Yahoo!\Messenger\Media\smileys\ , replacing the 'smile' and 'frown' files, or any two files, provided in the original download.]

4. Other features

Both *YM* and *MSNM* now contain numerous additional features equaling or surpassing the sophistication of more costly proprietary conferencing products. The chat box becomes the

medium for many of these features. Consider, for example, the 'co-browsing' facilities commonly offered by commercial packages, whereby a conference participant can take control of the other participants' browsers in order to guide them on 'web tours.' The same function can be adequately achieved in *YM* and *MSNM* by copying a Web address into the chat box and inviting participants to click on it. The file and graphic sharing features of these two freewares can be harnessed for similar educational effects; and the 'audibles,' *Macromedia Flash* and *Fireworks* options now included for entertainment purposes in *YM* and *MSNM* may prove particularly useful in delivering educational audio and animated presentations without the need for high-bandwidth video transmission.

Conclusions

There is really no need for distance educators to pay commercial license fees in order to obtain the varied features of sophisticated conferencing software. With a little ingenuity, the entertainment features of the *YM* and *MSNM* freeware tools can be customized for effective educational uses. Weighing the pros and cons of the two products described above, the authors regard *Yahoo Messenger* and its associated *Yahoo Chat* software as having the greatest current flexibility. The *YM* products also have the advantage of allowing up to 40 simultaneous participants without the charges and conference size restrictions of *MSNM* and MS *Chat*. In the writers' teaching experiences across South America, Asia, and the Pacific, even the most remote regions have numerous Internet kiosks, commonly used for online learning, with *YM* as the *de facto* messaging software. Online messaging and conferencing techniques are now standard in the mobile learning, 'texting' generation of students; and if distance educators wish to reach a maximal student market, they will have to become competent at using and optimizing these techniques.

> **N.B.** Owing to the speed with which Web addresses become outdated, online references are not cited in this report. They are available, together with updates to the current report, at the Athabasca University software evaluation site: *http://cde.athabascau.ca/softeval/*. Italicized product names in this report can be assumed to be registered industrial or trademarks.
>
> *JPB.* Series Editor, Technical Evaluation Reports

Appendix

Shorthand messages ('Emotes') recommended for use with *Yahoo Messenger/Chat*.

The following 'emote' lists contain moderator messages developed by the 1st author for his DE conferences. Each item uses the format of the 'emote.dat' file in the *Yahoo Messenger* freeware. For example:

01-Welcome\Welcome to the session, everyone\Welcome to the session, %s

in which

- 01-Welcome\ is the label displayed on the moderator's Chat Room 'Emotions' list;

- Welcome to the session, everyone\ is the automatic message generated when the moderator left-clicks twice on the item in the 'Emotions' list;

- Welcome to the session, %s is the automatic message generated when the moderator left-clicks twice on the item in the 'Emotions' list, and on the name of a specific recipient; and

- % is the name of the person addressed, as indicated by clicking on a name on the participants' list; if no name is indicated, the first command in each pair is generated.

The 32 automated messages listed below can be used in YM by removing the four sub-headings and saving the remaining list within an unformatted text file: C:\Program Files\Yahoo!\Messenger\emote.dat . The file should over-write the 'non-educational' list provided in the 'emote.dat' file with the *Yahoo Messenger* software. [Note: No carriage-return should be used at the end of the last line of the file.]

Set-up:

01-Welcome\Welcome to the session, everyone\Welcome to the session, %s

02-Busy\Setting up the session, pls talk among yourselves!\Would you pls run audio tests, %s?

03-IntroMod\I am the session's moderator\My name is %s and I will be your moderator today!

04-NextMod\Volunteer to moderate?\Would you pls be moderator, %s?

05-TechAsst\I will be technical assistant\Would you pls act as technical assistant, %s?

06-Thankyou\Thank you\Thanks, %s

Sequencing the participants:

07-Next\Who will speak next?\Next speaker: %s

08-Order\Please follow the speaking order\...and then %s...

09-Hand Up\I would like to speak\Would you like to speak, %s?

10-2 mins\2-minute wind-up signal...\2-minute wind-up signal, %s...

11-1 min\1-minute wind-up signal...\1-minute wind-up signal, %s...

12-Repeat\Would you repeat that last comment, pls?\Would you pls repeat that last comment, %s?

13-Wind-up\We should move on now\Please wind up now, %s

14-Comment?\Question or comment, anyone?\Question or comment, %s?

Protocol:

15-TextComm\Please type that in the textbox\Please type that in the textbox, %s

16-TextEss\Please reserve the textbox for essentials\Please reserve the textbox for essentials,%s

17-Brief\Please keep your comments brief\Please keep your comments brief, %s

18-SendFile\Could you e-mail the file?\Could you send the file to %s?

19-Messages\Sorry, can't respond to private messages\Sorry, %s, can't respond to private messages

20-Private\This is a private conference\This is a private conference, %s

21-Ignore\You can use 'Ignore User' to silence someone\Sorry, %s, we don't know you so have to ignore you

Technical:

22-HearYou\I hear you clearly\I hear you clearly, %s

23-HearMe?\Please type if you can't hear me?\ Can you hear me, %s?

24-AudBrkup\Your audio is breaking up\Your audio is breaking up, %s

25-AudLost\I have lost audio\I have lost %s's audio

26-AudSetup\You may need to check the Audio Setup \I recommend you check the Audio Setup, %s

27-AudReset\Try clicking voice button off and on\Try clicking voice button off and on, %s

28-Exit+Ent\I have lost audio and am exiting\Leave the chat, %s, and I'll invite you back in

29-SeeYou\I see your webcam\I see your webcam, %s

30-MyCam\Click on my webcam link (main box)\Click on %s's webcam link (main box)

31-SeeMe?\Do you see my webcam?\Do you see my webcam, %s?

32-CamInvMe\Please invite me to view your webcam\Please invite me to view your webcam, %s