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Editor, IRRODL

Welcome IRRODL readers (at least those in the northern hemisphere) to another academic year. This issue marks a number of new initiatives for IRRODL as well as a full issue with 10 research articles and four book reviews.

Managing editor Brigette McConkey has been busy improving the look and feel of the journal with more colour, pictures, and hopefully ease of access. You will note the special issue features that are permanently represented by an icon at the bottom of the home page. This attention to the special issue is a means to keep these topical issues alive, and indeed we have added two new articles to the *Prior, Experiential, and Informal Learning in the Age of Information and Communication Technologies* issue.

We are coming to realize that, unlike in paper journals, a special topic issue in an online journal can remain alive as new content is developed. These new articles can be hyperlinked to the special issue in a regular issue or more tightly focused and aggregated for inclusion within the special issue. You can read these articles or check out the summary included in the special issue editorial.

There is growing interest in “big data” throughout the education, publishing, and general business domains. I have editorialized and we have published a number of articles on journal citation bibliometrics. But in applied fields, readership by practitioners is arguably more important than citation by a small group of researchers. Therefore it would be nice (and either flattering or deflating to authors) to know and to be able to display how many times each article has been downloaded. However, this is not an easy task.

IRRODL is indexed by many sources, and some (notably EPSCO, JALN, ERIC, and SSCI) harvest and distribute the full text of our articles. Therefore, the number downloaded from IRRODL is an unknown fraction of the total number of downloads. Our downloads (in any of our four current formats), therefore, provide only a relative measure of the number of readers and an even more approximate indication of the article’s impact on readers. In addition, the download numbers are skewed in that an article published 11 years ago has had

a much greater length of time to garner downloads than one published this year. Nonetheless, our faithful Open Journal System (OJS) has tracked downloads since we began using this system six years ago. We compiled the following data last summer and found that the “top twenty” articles based on our downloads are as follows:

Article Title	G a l l e y Views
Conceptual Integration in Online Interdisciplinary Study: Current Perspective, Theories, and Implications for Future Research	74807
An Assessment of the Effectiveness of e-learning in Corporate Training Programs	39392
Plagiarism by Adult Learners Online: A Case Study in Detection and Remediation	31693
Building Sense of Community at a Distance	30793
Blended Learning and Sense of Community: A Comparative Analysis with Traditional and Fully Online Graduate Courses	26981
Instant Messaging for Creating Interactive and Collaborative m-Learning Environments	26481
Setting the New Standard with Mobile Computing in Online Learning	25987
Theoretical Challenges for Distance Education in the 21st Century: A Shift from Structural to Transactional Issues	25484
Replacing Face-to-Face Tutorials by Synchronous Online Technologies: Challenges and Pedagogical Implications	23615
A Comparative Study of Dropout Rates and Causes for Two Different Distance Education Courses	21455
Learners’ Perspectives on what is Missing from Online Learning: Interpretations through the Community of Inquiry Framework	19471
The Emergence of Open-Source Software in China	19141
Getting the Mix Right Again: An Updated and Theoretical Rationale for Interaction	18670
Learning Objects: Resources For Distance Education Worldwide	18032
Attitudes and Perceptions of Students to Open and Distance Learning in Nigeria	17648
Defining, Discussing and Evaluating Mobile Learning: The Moving Finger Writes and Having Writ . . .	17008
Second Language Acquisition Theories as a Framework for Creating Distance Learning Courses	16903
Mobile Usability in Educational Contexts: What Have we Learnt?	16480
Quality Standards in eLearning: A Matrix of Analysis	16225
Integrating Mobile Learning into Nomadic Education Programme in Nigeria: Issues and Perspectives	16014

We hope this data is of interest to those new to the field seeking to find the most relevant topics and issues. You can retrieve the full text of all articles published over the last 11 years in our archives. Article authors can also login to OJS (as authors) and see the current number of downloads in all formats by checking out their individual archive.

This Issue

As always, our regular issues present a variety of articles on diverse issues relevant to both our research and our practitioner communities. In addition, our Book Notes editor, Dr. Peter Cookson, has solicited reviews of four new books, which will be very useful in your decision to order—or prompt your library to do so!

The first article, “The Importance of Interaction for Academic Success in Online Courses with Hearing, Deaf, and Hard-Of-Hearing Students” by Gary Long, Carol Marchetti, and Richard Fasse, provides data on arguably the most contentious issue in distance education pedagogy, the role and effect of interaction. The paper focuses on a compelling context, online learning for the hard-of-hearing, a special needs group that has long benefited from the flexibility of distance education.

I have a special interest in the second article, “Examining Motivation in Online Distance Learning Environments: Complex, Multifaceted, and Situation-Dependent” by Maggie Hartnett, Alison St. George, and Jon Dron, as I served as the external reviewer on the dissertation upon which this work is based. I was impressed by the way motivation theory was applied to a qualitative study, and I think you will be as well.

From New Zealand, we move to Qatar, where Ramzi Nasser, Maha Cherif, and Michael Romanowski detail “Factors that Impact Student Usage of the Learning Management System in Qatari Schools.” Technology adoption and use becomes increasingly important in all countries as the pervasiveness of technology (in myriad instantiations) comes to permeate nearly all forms of education provision.

Regardless of the geography, quality assurance issues in distance education continue to interest and challenge students, parents, faculty, and governments. In “Quality Assurance in Asian Distance Education: Diverse Approaches and Common Culture,” authors Insung Jung, Tat Meng Wong, Chen Li, Sanjaa Baigaltugs, and Tian Belawati overview the issue and responses from an Asian perspective.

From Nigeria, Christine I. Ofulue writes “Literacy at a Distance in Multilingual Contexts: Issues and Challenges.” Adequate levels of literacy (even in its many definitions) challenge us as distance educators. This article notes the explosive use of mobile computing but reminds us that effective use of a technology for education may be quite a different task than merely trumpeting that technology’s use for verbal communication.

The next article again challenges the objectivity of the anonymous peer review process that is staunchly maintained at IRRODL in that I am the co-author. Rest assured that the article was blindly reviewed, and I express my thanks to Dr. Jon Baggaley for stepping in to handle

the editorial management of the review process. In this article, “Distance Students’ Readiness for Social Media and Collaboration,” my colleague Bruno Poellhuber and I examine the interest in social media within a large sample of students from four universities in Canada.

The now-familiar community of inquiry model is used in the next article to examine what has become an important new growth area in distance education, the provision of professional doctoral degrees. In “Applying the Community of Inquiry Framework to an Online Professional Practice Doctoral Program,” Swapna Kumar, Kara Dawson, Erik W. Black, Catherine Cavanaugh, and Christopher D. Sessums demonstrate the importance of each of the social, teaching, and cognitive presences. It is interesting to observe the evolution of this model from a tool for assessing online learning to one for designing and then evaluating new programming initiatives.

The next article addresses a critical need in all societies, but situates it in a Canadian context. Effective continuing education opportunities for teachers will be required in these times of rapid change. Thus, “Applying Constructionist Principles to Online Teacher Professional Development” by Nathaniel Mark Ostashewski, Doug Reid, and Susan Moisey presents a model for engaging teachers in online activities while allowing them to remain immersed in their authentic contexts.

The next article documents both the research and work still needed to bridge the digital divide in Africa and other countries. Olugbade Oladokun and Lenrie Aina examine “ODL and the Impact of Digital Divide on Information Access in Botswana.” They provide strategies and suggestions for distance educators struggling to both adjust to and reduce the inequality of access to many of the technology-rich models of distance education.

The research articles in this issue conclude with one of our rare articles published from France. In “Increased Technology Provision and Learning: Giving More for Nothing?” Emmanuelle Quillerou examines the resources that students actually put to effective use in distance education from a suite of tools and resources. Access to online resources makes it very easy to add more and more resources to our learning packages, but, as Quillerou argues, we need to consider their effective use rather than their availability alone.

Book Reviews

This editorial is likely stretching beyond the attention level of many readers, so I conclude by listing the titles and reviewers of four recent and compelling publications:

- *The Perfect Online Course: Best Practices for Designing and Teaching*, reviewed by Marta Ruiz-Corbella;
- *Web 2.0-Based E-Learning: Applying Social Informatics for Tertiary Teaching*, reviewed by Juan Leon;
- *Learning with Digital Games: A Practical Guide to Engaging Students in Higher Education*, reviewed by Maja Pivec; and

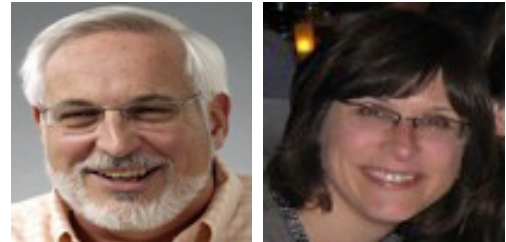
- *Bridging the Knowledge Divide: Educational Technology for Development*, reviewed by Aminudin Zuhairi

As always, I extend my sincere thanks to IRRODL authors, reviewers, editors, and our faithful readers! This issue contains works from Indonesia, Austria, Botswana, New Zealand, Spain, United States, Qatar, France, Canada, and Nigeria, among others, demonstrating the global impact of distance education and IRRODL.

Athabasca University 



The Importance of Interaction for Academic Success in Online Courses with Hearing, Deaf, and Hard-of-Hearing Students



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Abstract

This paper reports the findings of three studies within a program of research designed to better understand the factors contributing to the academic achievement of students in online courses and the contributions of interaction to online learning. The first study compared the academic achievement of students in the online and face-to-face (F2F) sections of multiple courses. In the second study, an online survey was used to obtain student perceptions of course satisfaction, learning, and communication. These factors were then related, using binary logistic regression analysis, to the amount of interaction that occurred in the students' respective online courses; information from the myCourses course management system was used to quantify the amount of interaction that occurred in online courses. In the final study, both datasets were used to examine the academic achievement of students in online courses based upon the amount of interaction that had actually occurred. Whenever possible, a subgroup of deaf and hard-of-hearing students was included in the study to increase our understanding of the role that communication plays in the teaching-learning process. Our findings indicate that students enrolled in online courses, especially those designed with high levels of online interaction, receive higher grades and report greater learning than students in comparable F2F courses. In addition, online courses appear to provide deaf and hard-of-hearing students with special benefits in terms of academic achievement through online discussion. Overall, the studies illuminate how the quantity of interaction in online discussions relates to important success factors. Students in online courses with more interaction outperformed students in online courses with less interaction.

Keywords: Online learning; distance learning; online discussion; asynchronous; interaction; deaf; hard-of-hearing

Introduction

Online learning is growing in popularity and effectiveness. Current estimates indicate that as many as four million students in North America are taking online courses (Allen & Seaman, 2008). In a systematic review of more than 1,000 studies comparing online and F2F learning, Means, Toyama, Murphy, Bakia, and Jones (2009) analyzed 51 studies that met their criteria for inclusion in a meta-analysis and concluded that “on average, students in the online learning conditions performed better than those receiving face to face instruction.” The study points to the dramatic evolution of online options for instruction and student-instructor and student-student interaction. Online learning has come a long way from the days when instruction was delivered via televised broadcasts or videoconferencing that was used to support web-based instruction in early generations of the initial Web. Today students are able to communicate directly with their instructor and each other, using the chat messaging and discussion forum features of their online courses or leaving comments for peers or their own written work in drop boxes, and are able to work collaboratively in virtual teams with student partners or in small groups on projects using online resources. This ease of communication with teachers and peers has changed the nature of online instruction from a passive, synchronous delivery system to an engaging, asynchronous arena for the active exchange of ideas.

Recently, Murugaiah and Thang (2010) utilized an active, collaborative, asynchronous approach to teaching English as a second language online to students at the National University of Malaysia. They incorporated interactive and reflective writing activities which helped to raise students’ awareness of their own learning processes and to become actively engaged learners responsible for their own learning. Faced with as many as 1,000 students for one teacher, the authors created a comfortable learning environment. The instructor initiated communication by asking students to introduce themselves online in English, and over time a learning community developed where students were able to help peers with their English writing. By engaging in coteaching, students learned about written English and how they and others best developed this complex skill.

This paper reports the findings of three studies in a program of research designed to better understand the factors contributing to online learning and the role of interaction in online courses. The first study compared the academic achievement of students in online and face-to-face (F2F) sections of the same course. In the second study, we used an online survey to examine student perceptions of course satisfaction, learning, and communication and related these to the amount of interaction that occurred in their course. Information from the myCourses course management system was used to quantify the amount of interaction that occurred in the online courses. Finally, we used both datasets to examine the academic achievement of students in online courses based upon the amount of actual interaction that occurred. Whenever possible, a subgroup of deaf and hard-of-hearing students was included to better understand the role that effective communication plays in the teaching-learning process for F2F and online courses.

Academic Setting

The Rochester Institute of Technology (RIT) is a private university in upstate New York with 17,000 students in nine colleges and institutes. Career education and experiential learning are emphasized in both F2F and online course offerings (<http://www.rit.edu/overview/fastfacts.html>). Currently, approximately 4% of courses are offered in a fully online format and the majority of the students in these courses are campus-based. Asynchronous online discussion forums are a key component of the online courses.

One of RIT's colleges is the National Technical Institute for the Deaf, with approximately 1,500 deaf and hard-of-hearing (D/HH) students. In any quarter, approximately 500 D/HH students are enrolled in RIT classes; their learning is supported with sign language interpreters and live captionists. Communication among D/HH students and their hearing peers in the F2F courses is challenging for a variety of reasons. Although the D/HH students can use a support service to participate in class discussions with their hearing peers, they are limited by communication-related challenges such as the processing time required for the interpreter to convey the message. Lack of knowledge of interpretation protocols is also a concern as instructors often call on a hearing student for an answer before the interpreter has finished signing the original question. Furthermore, observation of mixed groups of D/HH and hearing students indicates that in small groups members often communicate directly with each other (hearing to hearing and deaf to deaf) instead of going through a service provider for communication between deaf and hearing participants (Stinson, Liu, Saur, & Long, 1996). Direct communication between D/HH and hearing students is often a challenge and decreases the level of participation by some or all members of the group. These communication difficulties often lead to student passivity (Saur, Layne, Hurley, & Opton, 1986) and decreased learning for the deaf and hard-of-hearing students (Richardson, Marschark, Sarchet, & Sapere, 2010).

The text-based format of online courses and the written communication used in asynchronous discussion forums allows D/HH students to communicate directly with their hearing peers and instructors and may provide them with greater access to information than they have in a F2F, lecture-based class.

The RIT online learning program has been informed primarily by the "Seven Principles for Good Practice in Undergraduate Education" (Chickering & Gamson, 1987) and through active participation in the Sloan-C consortium of schools. The use of asynchronous "anywhere, anytime" strategies for engaging students is a key part of the course design. Most courses use online discussion for whole class participation, small group discussion, and collaboration to support group and team projects.

Procedure

Student success in online courses was explored from three perspectives: (a) grade distribution analysis, (b) level of interaction analysis, and (c) grades by quartile.

Grade Distribution Analysis

To address how student academic achievement in online courses compared to achievement in face-to-face courses, the grades of all students taking a course offered in both an online and face-to-face format were obtained for the period between the fall quarter of the 2007–2008 academic year and the spring quarter of 2008–2009. Chi-square statistical analysis was used to compare the grades received in the online and face-to-face courses for deaf/hard-of-hearing and for hearing students.

Level of Interaction Analysis

Students enrolled in online courses during the three quarters of the 2007–2008 academic year were surveyed to obtain their perceptions of important factors related to learning. A questionnaire titled *Online Discussion: Student Survey* (Appendix A) was provided to approximately 2,000 students in each quarter using *Clipboard*, a web-based survey administration tool. Each student was emailed a link to access the survey. Students who completed the survey were entered into a drawing for a \$50 gift certificate at the campus bookstore.

Grades by Quartile Analysis

Four hundred and thirty-two online courses were divided into quartiles based on the score for the course from the interaction metric. Each quartile consisted of 108 courses. Student academic achievement was then examined by quartile to see if there was a relationship between the amount of interaction that occurred in online courses and the performance of the students in those courses.

For the level of interaction analysis, Table 1 provides enrollment figures and survey response rates for the overall group and for the hearing-impaired subgroup for each of the three quarters of the academic year. The response rate declined in each quarter as more of the students taking an online course had completed the survey in a previous quarter. In every quarter, the response rate of the deaf and hard-of-hearing students exceeded the overall response rate.

The survey results were analyzed using course interaction as an explanatory variable. The statistic used takes all the interaction in myCourses and averages it by the number of people in the class. This interaction metric included messages posted in the online discussion, public and private comments left in the grade book, feedback left in the dropbox, news announcements posted in the course, calendar items posted in the course, and the number of chat rooms created in the course. Courses were then rank-ordered and divided into quartiles based on the amount of interaction that occurred in that class.

Table 1

Survey Participants and Response Rates by Quarter

Quarter	Enrollments		Number of responses		Response rate	
	All students	D/HH students	All students	D/HH students	All students	D/HH students
2007-1	1989	69	633	38	32%	55%
2007-2	1994	95	398	32	20%	34%
2007-3	2007	89	252	18	13%	20%
TOTAL	5990	253	1283	88	21%	35%

Findings

Grade Distributions

A chi-square analysis was used to compare the grade distributions (A, B, C, D, F) for the hearing and the deaf/hard-of-hearing students enrolled in the online and face-to-face sections of comparable courses (i.e., with each section having the same course number) (Figure 1). Significant differences in grade distributions were found for hearing ($\chi^2 = 868.3, df = 4$ and $p < 0.0001$) and deaf/hard-of-hearing students ($\chi^2 = 101.8, df = 4$, and $p < 0.0001$). In both the hearing and deaf/hard-of-hearing comparisons, the online sections had more As and fewer Cs than expected (while the face-to-face sections had fewer As and more Cs than expected).

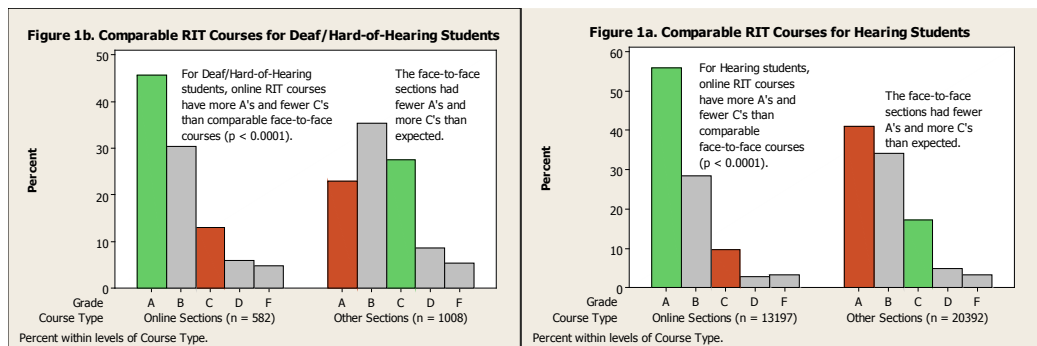


Figure 1. Grade distributions in comparable online and face-to-face courses.

College GPA Comparison

Only four colleges had sufficient data (comparable online and face-to-face sections of the same course and large enough sample sizes) for GPA comparisons. All student grades were averaged for the entire set of online courses (with comparable F2F sections) for each college using A=4, B=3, C=2, D=1, F=0. Withdrawals and incompletes were not included in the analysis. The same computations were made for the F2F sections for each college.

Grade point averages for online and face-to-face sections varied among the colleges (Table 2). In the Colleges of Business and Applied Science and Technology, the online sections had a higher GPA than the face-to-face sections of courses; the College of Liberal Arts also had a higher, but less extreme, GPA in the online sections. However, in the College of Science, the GPA of the face-to-face sections was comparable to that of the online sections for the hearing students and higher than the GPA of the online sections for deaf and hard-of-hearing students. The lower GPA of the deaf/HH students in the online sections may be attributed to the symbolic notation and graphics used in the mathematics and science courses, which are not easily communicated online.

Table 2

Average GPA in Online and Face-to-Face Sections of Different Colleges

College	GPA (number of students)	
	Online sections	Face-to-face sections
Applied Science & Technology		
Hearing	3.23 (5066)	2.93 (2938)
Deaf/Hard-of-hearing	3.04 (265)	2.79 (82)
Business		
Hearing	3.09 (696)	2.92 (2181)
Deaf/Hard-of-hearing	2.85 (55)	2.24 (93)
Liberal Arts		
Hearing	3.10 (1016)	3.00 (9121)
Deaf/Hard-of-hearing	2.86 (67)	2.56 (584)
Science		
Hearing	3.03 (1071)	3.04 (3601)
Deaf/Hard-of-hearing	2.25 (44)	2.75 (211)

College of Liberal Arts Analysis

The College of Liberal Arts (COLA) was chosen for further analysis. In the COLA, a total of 17 courses were offered in both online and face-to-face formats during the 2007–2008 academic year; deaf and hard-of-hearing students were enrolled in 11 of these courses. Chi-square analyses were performed to compare the grade distributions of the online sections of the COLA courses with the comparable face-to-face sections (Figure 2). The grade distributions of the hearing students were significantly different ($\chi^2 = 36.1$, $df = 4$ and $p < 0.0001$), with online sections earning more As and Fs and fewer Cs than expected. The grade distributions for D/HH students also differed significantly ($\chi^2 = 10.5$, $df = 4$ and $p = 0.015$), but with more As and fewer Cs, Ds, and Fs than expected.

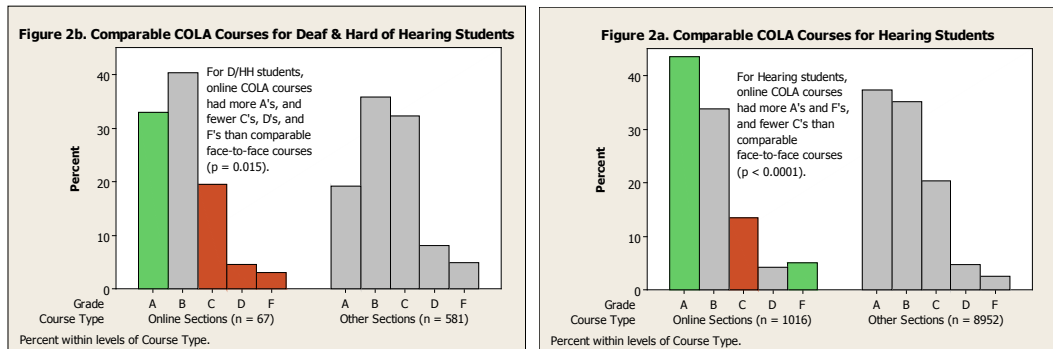


Figure 2. Grade distributions of F2F and online sections of College of Liberal Arts courses.

Level of Interaction

The level of interaction in online sections was examined in four main areas of interest: *satisfaction*, *learning*, *interaction*, and *communication*. Students in online courses were provided with seven questions, each with a Likert scale of strongly agree, agree, disagree, strongly disagree, or no response (Table 3). The positive and negative responses were combined to create a binary response variable (agree/disagree) and a binary logistic regression model for each question.

Table 3

Questions Analyzed with Binary Logistic Regression

Area	Question(s)
Satisfaction	I am more satisfied with this course than I am with most courses.
Learning	I learned more in this course than I do in most courses. I learned more from other students than I do in most courses.
Interaction	I interacted with other students more than I do in most courses. I interacted with the instructor more than I do in most courses.
Communication	My ability to communicate my ideas improved because of the online interaction in this course. I was able to express my ideas more clearly because of the online interactions.

Three explanatory factors were included in each regression:

- Q-Code, the level of interaction quartile for the course based on the interaction metric;
- Hearing Status, a self-identification by the student;

- English as a Second Language (ESL) Status, a self-identification by the student.

Binary logistic regression fits a linear model, using the natural log of the odds-ratio as the dependent variable. The model is defined as follows:

$\text{Ln}[\text{Odds-Ratio for Agreement}] = \text{Intercept} + \text{Q-Code} + \text{Hearing-Status} + \text{ESL-Status}$, where

the odds-ratio for agreement is the probability of “Agree” divided by probability of “Disagree,” and Q-Code represents the quartile for a course section in terms of its level of online interaction through the course management system.

The 432 online courses were divided into quartiles based on the score for the course from the interaction metric. Each quartile consisted of 108 courses. Table 4 provides a comparison of the Q-Codes using the course interaction metric, showing the average number of messages per week, the percentage of courses using the “groups” feature, and the average number of course features used. Q1 had the highest level of interaction, while Q4 had the lowest.

Table 4

Q-Code Level of Interaction Description

Q-Code	Average number of messages per week	Percentage of courses using groups	Average number of course features used
Q1	9.3	62%	7.2
Q2	4.2	38%	6.5
Q3	2.0	19%	5.9
Q4	0.4	10%	3.9

Satisfaction and Overall Learning

From the binary logistic regressions, it was determined that perceived satisfaction and overall learning for the course were not significantly affected by Q-Code, Hearing Status, or ESL Status. Neither of the regressions was significant ($G = 5.86$, $df = 6$, $p = 0.439$ and $G = 12.19$, $df = 6$, $p = 0.058$, respectively).

Learning from Other Students and Interaction with the Instructor

Learning from other students and interaction with the instructor had significant regressions ($G = 98.6$, $df = 6$, $p < 0.0001$ and $G = 21.7$, $df = 6$, $p < 0.0001$, respectively); however, only Q-Code significantly affected agreement with the statement. As described below, the highest level of agreement occurred for Q1 and decreased with each subsequent quartile of interaction.

- For learning from other students, when holding Hearing Status and ESL Status constant, the odds of agreeing for Q2, Q3, and Q4 differed significantly from the odds of agreeing for Q1 ($Z = -2.05$ and $p = 0.041$, $Z = -5.94$ and $p < 0.0001$, and $Z = -8.40$ and $p < 0.0001$, respectively).
- For interaction with the instructor, when holding Hearing Status and ESL Status constant, the odds of agreeing for Q2, Q3, and Q4 differed significantly from the odds of agreeing for Q1 ($Z = -2.38$ and $p = 0.017$, $Z = -2.40$ and $p = 0.016$, and $Z = -3.27$ and $p = 0.001$, respectively).

Table 5 provides the percentages of agreement for each question within each quartile.

Table 5

Agreement for Learning from Other Students, Interacting with the Instructor

Q-Code	“I learned more from other students than I do in most courses.”		“I interacted with the instructor more than I do in most courses.”	
	<i>n</i>	Agree	<i>n</i>	Agree
Q1	408	58.82%	409	44.01%
Q2	336	51.19%	337	35.61%
Q3	304	36.18%	303	34.98%
Q4	213	21.60%	213	30.52%

Interaction with Other Students, Communication, and Expression

The regressions for increased interaction with other students, improved ability to communicate, and improved ability to express ideas were all significant (with $G = 128.7$, $df = 6$, $p < 0.0001$, $G = 83.3$, $df = 6$, $p < 0.0001$, and $G = 63.3$, $df = 6$, $p < 0.0001$, respectively), with both Q-Code and Hearing Status significantly affecting agreement with the statement.

The following findings were determined for interaction with other students (Table 6).

- Holding Hearing Status and ESL Status constant, the odds of agreeing for Q2, Q3, and Q4 differ significantly from the odds of agreeing for Q1. ($Z = -3.41$ and $p = 0.001$, $Z = -8.09$ and $p < 0.0001$, and $Z = -8.83$ and $p < 0.0001$, respectively).
- Holding Q-Code and ESL Status constant, the odds of agreeing for Deaf differ significantly from the odds of agreeing for Hearing ($Z = 1.98$ and $p = 0.048$), while the odds of agreeing for Hard of hearing do not ($Z = 1.53$ and $p = 0.127$).

Figure 3 shows the significant odds-ratio results graphically.

- Compared to Q1, the odds of agreeing with this statement are decreased by a factor of 0.60 if the course falls into Q2. Compared to Q1, the odds of agreeing are decreased by a factor of 0.27 for Q3. Compared to Q1, the odds are decreased by a factor of 0.18 for Q4.
- Compared to Hearing, the odds of agreeing with this statement are increased by a factor of 1.85 if the student is Deaf.

Table 6

Agreement with “I interacted more with other students than I do in most courses”

Hearing			Deaf			Hard of hearing		
Q-Code	<i>n</i>	Agree	Q-Code	<i>n</i>	Agree	Q-Code	<i>n</i>	Agree
Q1	379	60.69%	Q1	20	70.00%	Q1	9	66.67%
Q2	313	49.96%	Q2	14	64.29%	Q2	12	75.00%
Q3	281	30.25%	Q3	12	25.00%	Q3	10	30.00%
Q4	201	20.40%	Q4	7	57.14%	Q4	4	50.00%

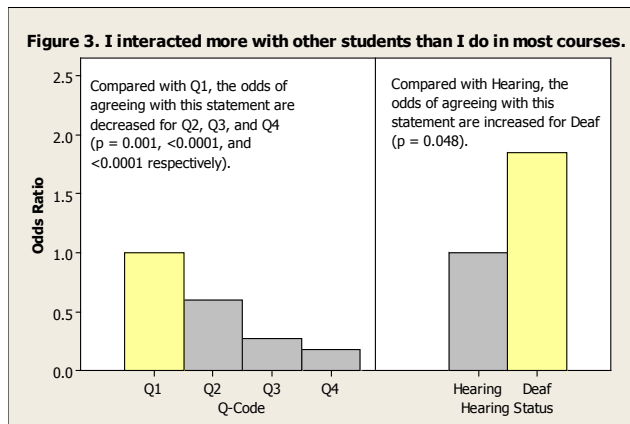


Figure 3. Odds-Ratios for “I interacted more with other students than I do in most courses.”

The following findings were found for “improved ability to communicate my ideas because of the online interaction in this course” (Table 7).

- Holding Hearing Status and ESL Status constant, the odds of agreeing for Q2, Q3, and Q4 differ significantly from the odds of agreeing for Q1. ($Z = -2.75$ and $p = 0.006$, $Z = -5.66$ and $p < 0.0001$, and $Z = -7.68$ and $p < 0.0001$, respectively).
- Holding Q-Code and ESL Status constant, the odds of agreeing for Deaf differ significantly from the odds of agreeing for Hearing ($Z = 2.67$ and $p = 0.008$), while the odds of agreeing for Hard of hearing do not ($Z = 1.09$ and $p = 0.275$).

In Figure 4, it can be seen that

- compared with Q1, the odds of agreeing with this statement are decreased by a factor of 0.65 if the course falls into Q2, by a factor of 0.41 for Q3, and by a factor of 0.25 for Q4;
- compared with Hearing, the odds of agreeing with this statement are increased by a factor of 2.50 if the student is Deaf.

Table 7

Agreement with “My ability to communicate my ideas improved because of the online interaction in this course”

Hearing			Deaf			Hard of hearing		
Q-Code	<i>n</i>	Agree	Q-Code	<i>n</i>	Agree	Q-Code	<i>n</i>	Agree
Q1	376	68.62%	Q1	20	80.00%	Q1	9	66.67%
Q2	311	57.88%	Q2	14	78.57%	Q2	12	75.00%
Q3	280	46.07%	Q3	12	83.33%	Q3	10	50.00%
Q4	207	35.15%	Q4	7	42.86%	Q4	4	75.00%

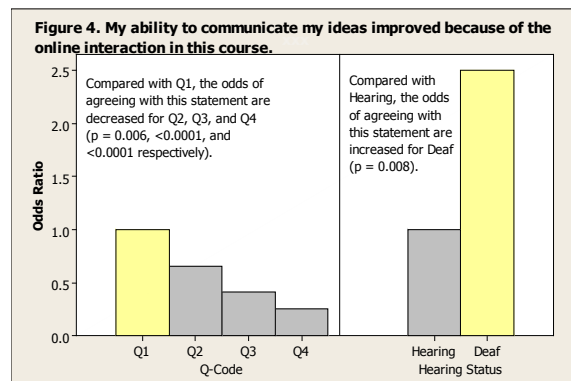


Figure 4. Odds-Ratios for “My ability to communicate my ideas improved because of the online interaction in this course.”

The following findings were found for “ability to express my ideas more clearly because of the online interactions” (Table 8).

- Holding Hearing Status and ESL Status constant, the odds of agreeing for Q2, Q3, and Q4 differ significantly from the odds of agreeing for Q1. ($Z = -2.41$ and $p = 0.016$, $Z = -3.18$ and $p = 0.001$, and $Z = -7.27$ and $p < 0.0001$, respectively).
- Holding Q-Code and ESL Status constant, the odds of agreeing for Deaf differ significantly from the odds of agreeing for Hearing ($Z = 2.23$ and $p = 0.026$), while the odds of agreeing for Hard of hearing do not ($Z = 0.21$ and $p = 0.834$).

Figure 5 illustrates that

- compared with Q1, the odds of agreeing with this statement are decreased by a factor of 0.69 if the course falls into Q2, by a factor of 0.61 for Q3 compared to Q1, and by a factor of 0.27 for Q4;
- compared with Hearing, the odds of agreeing with this statement are increased by a factor of 2.11 if the student is Deaf.

Table 8

Agreement with “I was able to express my ideas more clearly because of the online interactions”

Hearing			Deaf			Hard of hearing		
Q-Code	<i>n</i>	Agree	Q-Code	<i>n</i>	Agree	Q-Code	<i>n</i>	Agree
Q1	375	67.20%	Q1	20	70.00%	Q1	9	55.56%
Q2	310	57.10%	Q2	14	85.71%	Q2	12	66.67%
Q3	280	53.93%	Q3	12	83.33%	Q3	10	50.00%
Q4	201	34.83%	Q4	7	42.86%	Q4	4	75.00%

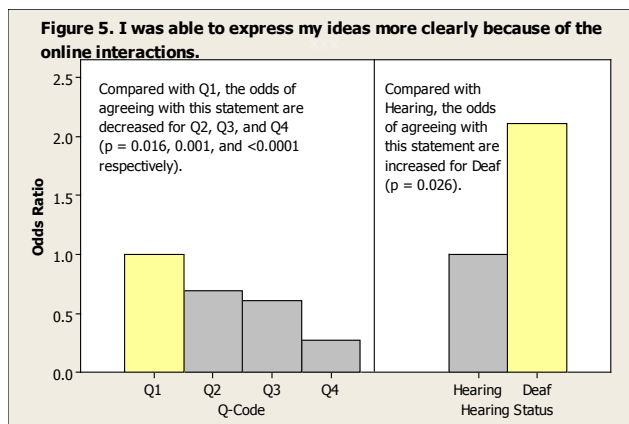


Figure 5. Odds-Ratios for “I was able to express my ideas more clearly because of the online interactions.”

Student Comments

Some of the survey comments from deaf and hard-of-hearing students in the second study illustrate what we believe are important factors to their greater success in online courses. Asynchronous online discussion affords the deaf and hard-of-hearing students the time to more fully comprehend the discussion compared to mediated instruction in the live classroom with an interpreter. This “slower” pace also allows these students to participate more fully because they can take the time to reflect and construct their own ideas and respond to those of peers. Deaf and hard-of-hearing students responded in their own words to the following open-ended question:

What did you like best about this course?

I get to interact more with other students online rather than in class where I tend to clam up—because of my hearing loss and sometimes I don't always know what to say quickly on the spot, while online, I have more time to reflect and respond.

Liked studying at my own pace. Good interaction with the professor.

Written English, because sometimes I could communicate with other team members online with written English better than with an interpreter.

I like the fact that we have equal access to communication!

What I liked best about this course was that it was easier for me to participate in discussions without getting behind due to a delay through an interpreter. I was on the same 'playing field' which was nice.

I love the way the discussions involves the whole class and part of it is because the teacher requires us to make meaningful comments and our own thoughts to the question. It's the best part actually. (...) The discussions are great because of the interaction between all members of the class.

I liked the discussions online the best in the course. It was interesting to hear other people's opinions, experiences and perspectives on different topics we covered in class.

Grades by Quartile

In the third study, we examined the grade distributions of all students (hearing, deaf and hard-of-hearing combined) in 432 online courses by the course's interaction quartile. A chi-square analysis indicates significant differences in the grade distributions ($X^2 = 133.6$, $df = 12$, $p < 0.0001$). A closer look revealed the following.

- Quartiles with more interaction (Q1 and Q2) had far more As than expected if the grade distributions for all quartiles were equally distributed.
- Quartiles with less interaction (Q3 and Q4) had far fewer As than expected.

- Q1 had far fewer Cs than expected.

Clearly, students in online courses with more interaction are outperforming those in online courses with less interaction.

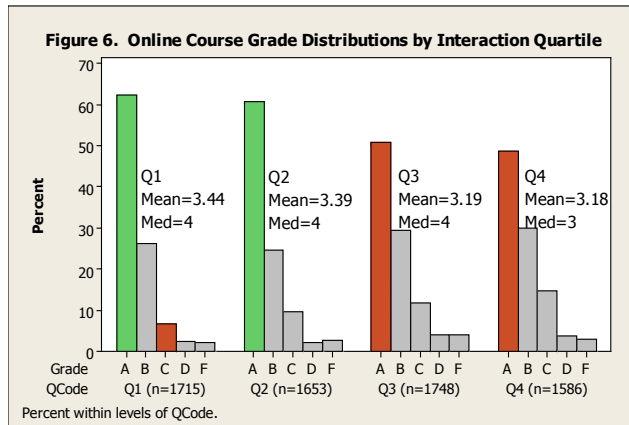


Figure 6. Online course grade distributions by interaction quartile.

Summary and Conclusion

In this paper we report on three studies, part of an ongoing research program now at the National Technical Institute for the Deaf (NTID), one of the nine RIT colleges, that suggest the reflective nature of asynchronous online discussion is helping our hearing, deaf and hard-of-hearing students achieve better academic results than in comparable campus-based courses. The first study analyzed grade distributions over a two-year period for online courses and their campus-based equivalents. Although there were some interesting exceptions, students in the online courses earned higher grades on average than the students in the face-to-face courses, and deaf and hard-of-hearing students had an even larger achievement increase than the hearing population.

The second study explored how the quantity of interaction in online courses related to student perceptions of course satisfaction, learning, and ease of communication. While no effect was found for perceived satisfaction or learning, we found that students in the most interactive courses communicated with the instructor and other students “more than I do in most courses.” Students also said that they were better able to communicate/express their own ideas “because of the online interactions in this course.” Our data suggests there are significant benefits for deaf and hard-of-hearing students enrolled in online courses with hearing students.

The third study looked at academic achievement of students enrolled in 432 online courses based on the amount of online interaction that occurred in the course. Students enrolled in online courses with more interaction outperformed students in online courses with less interaction. Students in the second survey study said that online interaction was important to their learning, and findings of the third study confirmed the validity of these perceptions

with higher GPAs for more interactive courses.

One limitation of this work is the field nature of our data where students in the online and F2F classes were not randomly assigned. It is possible that with self-selection “brighter” students were going into the online sections, and we have no external measure to determine if this is true or not. However, it is hard to explain why the results were even more striking for the students with a hearing loss and these same students responded the most positively about being able to communicate with peers online in the second study that included the survey. What we do know is that students in the online courses with the most interaction had better academic achievement than students in the courses with the least interaction. This link speaks to the importance of students learning from each other as a critical component of overall learning in the online environment.

It can be extremely difficult for students with a hearing loss to keep up with classroom presentations and to be full participants in discussions in a traditional lecture-focused classroom. All information is taken in through the eyes, so allocating time to the multiple inputs in a classroom (instructor, Power Point slides, interpreter, other students) can be an overwhelming information-processing task. If this complex process isn’t monitored and controlled by the instructor (allowing students time to read slides before speaking, pausing to allow the interpreter to finish signing a question before calling on a student to answer it, pointing to the student answering the question, and allowing one student to respond at a time) communication breaks down and D/HH students no longer have access to the information. Findings of the present study indicate the importance of online peer interaction to learning for all students. It also speaks to the effectiveness of online interactions for facilitating direct communication between hearing and D/HH students and the associated learning that occurs.

In the next phase of our research we will collaborate with online faculty who have taught courses with three or more deaf or hard-of-hearing students during the past year to identify “best practices” for online instruction. We also have about 200 F2F courses on campus each quarter with deaf and hard-of-hearing students enrolled with hearing students and supported with interpreters and notetakers. We hope to collaborate with faculty teaching the F2F classes to redesign their courses to include online discussions that can effectively give all students, especially the deaf and hard-of-hearing, a better educational experience.

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APPENDIX

Student Survey: Online Discussion

RIT Home | RIT A-Z Index | RIT Search | myRIT

CLIPBOARD

The Wallace Center at RIT

My Surveys + New Survey Help Welcome, Richard Fasse (logout)

Student Survey - Online Discussion 20073 [< return to survey information](#)

The Online Learning Department needs your input to continuously improve our fully online courses and support services. Please take a few minutes to complete this survey and help us better understand your experiences this quarter in your fully online course. This is the last part of a 3 quarter research project. Thanks for your continued participation.

1. Which of the following most closely reflects your student workload status?

- I am a full-time student.
- I am a part-time student.

2. What is your hearing status?

- I am a hearing student.
- I am hard-of-hearing.
- I am deaf.

3. I am a(n)

- undergraduate student.
- graduate student.

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4. Is English a second language for you?

Yes
 No

5. How much experience do you have with fully online courses?

This was my first fully online course.
 I have taken 1 or 2 other fully online courses.
 I have taken 3 or more fully online courses.

6.

	Strongly Disagree	Disagree	Agree	Strongly Agree
I interacted with other students more than I do in most courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know my classmates better than I do in most courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I learned more from other students than I do in most courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I interacted with the instructor more than I do in most courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know my instructor better than I do in most courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I learned more from the instructor than I do in most courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This course is more work than most courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I learned more in this course than I do in most courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more satisfied with this course than I am with most courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The online interactions I had with other students helped me learn more about the course content.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My ability to communicate my ideas improved because of the online interaction in this course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was able to express my ideas more clearly because of the online interactions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe there is more academic dishonesty in online courses than in traditional campus courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7.

	Unimportant	Somewhat Important	Important	Very Important	Does not apply
Course organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Team projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quick feedback on assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Small group online discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Whole class online discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instructor participation in online discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instructor created course content (video, animation, PowerPoint, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Textbook and publisher supplied materials (eg. web sites and CDs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Please share any comments or suggestions you have for making RIT's fully online courses better.

9. What did you like best about this course?



Examining Motivation in Online Distance Learning Environments: Complex, Multifaceted, and Situation-Dependent



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John Dron, Athabasca University, Canada

Abstract

Existing research into motivation in online environments has tended to use one of two approaches. The first adopts a trait-like model that views motivation as a relatively stable, personal characteristic of the learner. Research from this perspective has contributed to the notion that online learners are, on the whole, intrinsically motivated. The alternative view concentrates on the design of online learning environments to encourage optimal learner motivation. Neither approach acknowledges a contemporary view of motivation that emphasises the situated, mutually constitutive relationship of the learner and the learning environment. Using self-determination theory (SDT) as a framework, this paper explores the motivation to learn of preservice teachers in two online distance-learning contexts. In this study, learners were found to be not primarily intrinsically motivated. Instead, student motivation was found to be complex, multifaceted, and sensitive to situational conditions.

Keywords: Motivation; self-determination theory; online learning; distance education; e-learning; intrinsic; extrinsic

Introduction

Over the last decade and a half, distance education has undergone a period of considerable change (Larreamendy-Joerns & Leinhardt, 2006). The growth of the Internet and related technologies has resulted in a merging of online teaching and learning into the routine practices of universities. At the same time, it has given distance education a new appeal (Tallent-Runnels et al., 2006). Following Bates (2005), online learning is viewed here as a subcategory of distance education that specifically uses the Internet and the World Wide Web. It is one increasingly popular method being used by institutions in various countries to provide opportunities and meet the needs of a growing and increasingly diverse student population (Rumble & Latchem, 2004). Teacher education is one area which has seen a

dramatic increase in the availability of technology-enabled distance education programmes over the last decade (Robinson & Latchem, 2003).

Online learning has a number of potential benefits, not least of which is the ability to overcome the temporal and spatial restrictions of traditional educational settings (Bates, 2005). Freedom from constraint may also be seen as a defining feature of distance learning, for example freedom of content, space, medium, access (Paulsen, 1993), and relationship development (Anderson, 2006). Notwithstanding the advantages that online learning offers, a variety of factors have been identified as crucial to the success of online courses (McIsaac & Gunawardena, 1996). Motivation is one such factor (Bekele, 2010). Just as motivation is a key factor in learning and achievement in face-to-face educational contexts (Brophy, 2010), so it is in online learning environments (Jones & Issroff, 2007).

Poor motivation has been identified as a decisive factor in contributing to the high dropout rates from online courses (Mulenburg & Berge, 2005). This, coupled with an increasingly diverse and inclusive student population (Rumble & Latchem, 2004), has caused some (McCombs & Vakili, 2005) to question previously held underlying assumptions that view online learners as independent, self-directed, and intrinsically motivated (Garrison, 1997).

Motivation and Learning Online

Schunk, Pintrich, and Meece (2008) define motivation as “the process whereby goal-directed activity is instigated and sustained” (p. 4). Motivation can influence what we learn, how we learn, and when we choose to learn (Schunk, 1995). Research shows that motivated learners are more likely to undertake challenging activities, to be actively engaged, to enjoy and adopt a deep approach to learning, and to exhibit enhanced performance, persistence, and creativity (see Schunk et al., 2008). Contemporary views link motivation to individuals’ cognitive and affective processes, such as thoughts, beliefs, and goals, and emphasise the situated, interactive relationship between the learner and the learning environment (Brophy, 2010).

Studies that explore motivation to learn in online contexts are relatively limited both in number and scope (Artino, 2008; Bekele, 2010). Existing research has had a tendency to adopt a limited view of motivation that does not acknowledge the complexity and dynamic interplay of factors underlying and influencing motivation to learn (Brophy, 2010). Instead, designing motivating learning environments has received attention (ChanLin, 2009; Keller, 2008). More frequently, motivation has been viewed as a personal characteristic that remains relatively stable across contexts and situations. Studies adopting this model have focused on identifying lists of traits of successful online learners (Wighting, Liu, & Rovai, 2008; Yukselturk & Bulut, 2007) and indicate that intrinsic motivation is a common characteristic (Shroff, Vogel, & Coombes, 2008; Styer, 2007). Findings from comparative studies between online students and on-campus students (Rovai, Ponton, Wighting, & Baker, 2007; Shroff & Vogel, 2009; Wighting et al., 2008) also suggest that online students are more intrinsically motivated across the board than their on-campus counterparts at both undergraduate and postgraduate level. While intrinsic motivation may influence initial engagement as well as retention in online study, research that treats intrinsic and extrinsic

motivation as a dichotomy may present an overly simplistic view of both contextual effects and motivation itself.

Viewing motivation solely as an effect of the learning environment or as a learner attribute does not recognise that individuals can be motivated to a greater or lesser degree, and in different ways, in any given context and time (Turner & Patrick, 2008). Few studies of on-line learning environments have acknowledged this contemporary “person in context” situated view of motivation and have done so only in a limited way (Shroff, Vogel, Coombes, & Lee, 2007; Xie, DeBacker, & Ferguson, 2006). Together, these factors point to the need to reconsider motivation to learn in technology-mediated environments.

Self-Determination Theory (SDT)

As suggested by Miltiadou and Savenye (2003), studies of motivation in online learning environments have adopted various frameworks to underpin their research (e.g., Artino, 2008; Shroff et al., 2007; Yukselturk & Bulut, 2007). Of these, intrinsic–extrinsic motivation theory has often been used to explore students’ reasons for engagement in online environments (e.g., Martens, Gulikers, & Bastiaens, 2004; Xie et al., 2006). An influential theory that explicates intrinsic–extrinsic motivation in greater depth is self-determination theory (SDT, Deci & Ryan, 1985). Self-determination theory is a contemporary theory of situated motivation that is built on the fundamental premise of learner autonomy. SDT argues that all humans have an intrinsic need to be self-determining or autonomous (i.e., experience a sense of agency and control), as well as to feel competent (i.e., capable) and connected (i.e., included and linked to others) in relation to their environment. SDT states that if environmental conditions are such that they support an individual’s autonomy then more autonomous forms of motivation will be promoted (Ryan & Deci, 2000).

When intrinsically motivated, students do not need outside incentives, and these may even be counterproductive (Deci, Koestner, & Ryan, 2001) as the reward lies in the doing of the activity. In contrast, students who are extrinsically motivated undertake activities for reasons separate from the activity itself (Ryan & Deci, 2000), for example gaining good grades, avoiding negative consequences, or because the task has utility value, such as passing a course in order to earn a degree. SDT explains extrinsic motivation processes in terms of external regulation as the reasons for undertaking the task lie outside the individual. However, the degree to which an activity is perceived as externally controlled can vary, and therefore different types of extrinsic motivation exist. This model conceptualises a continuum of regulation that ranges from amotivation (lack of motivation) at one end to intrinsic motivation at the other. Between these, there exist different types of extrinsic motivation that vary in the degree to which externally motivated behaviour is autonomously determined (i.e., self-determined).

According to the taxonomy, amotivated individuals lack motivation or intention to act. This may be because of a feeling of incompetence or low self-efficacy (Bandura, 1997), a perception that what they do will not affect the outcome (Peterson, Maier, & Seligman, 1993), or an attribution of low value to the task being undertaken (Brophy, 2008). Beyond this,

extrinsic motivation and intrinsic motivation have often been treated as a dichotomy, especially in earlier research (see Schunk et al., 2008). Within the continuum of human motivation, however, four patterns of extrinsic motivation are identified.

External regulation is the type of extrinsic motivation most often contrasted with intrinsic motivation, where individuals are responsive to threats of punishment or the offer of rewards and tend to be compliant as a result.

Introjection refers to students who engage in a task because they feel they should due to the expectations of others.

Identified regulation is associated with individuals who engage in an activity because the results may have personal value to them or because the activity is regarded as worthwhile. Regulation is internal in the sense that the individual has chosen the goal or identifies with it and is aware of its importance. But the motivational pattern is still considered extrinsic in the sense that it is the utility value (a means to an end), personal importance, and/or relevance of the task rather than interest and enjoyment in the task itself that determines the behaviour (Brophy, 2008). Identified regulation is considered particularly important from a practical viewpoint because the perceived relevance and worthwhileness of learning activities can be influenced by the choices made by teachers and course designers (Brophy, 2010).

Integration is the final and most autonomous type of extrinsic motivation, where learners engage in the activity because of its significance to their sense of self.

Figure 1 shows the elements of the SDT model, described above, that form the basis of the scale used to measure motivation in this investigation. Here, the focus is on the external regulation and identified regulation aspects of extrinsic motivation, as well as on amotivation and intrinsic motivation. The placement of intrinsic motivation on the far right is not intended to suggest that extrinsic motivation can shift to intrinsic motivation as this depends on the intrinsic interest of the activity to the individual. It is placed here to highlight that it is the best example of human autonomy (Deci & Ryan, 2002).

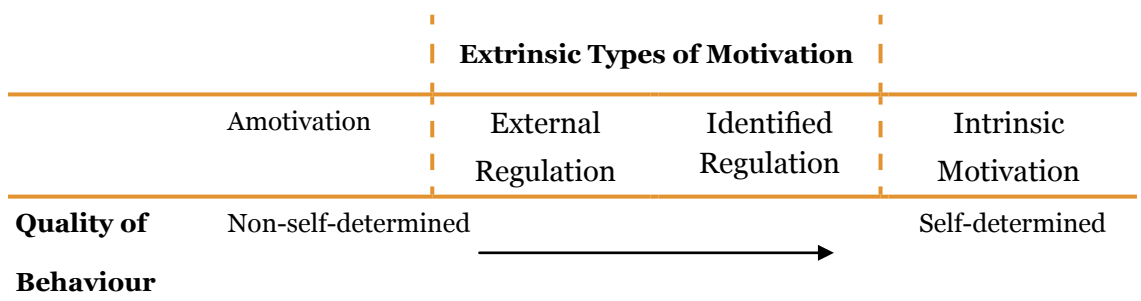


Figure 1. Elements of the SDT model of motivation used to measure motivation in this study.

Research in traditional education contexts has shown that multiple types of motivation (ex-

plicated by this model) can and do co-exist (Lepper, Henderlong Corpus, & Iyengar, 2005). The ways in which a student is intrinsically or extrinsically motivated are important, with more self-determined students experiencing positive learning outcomes even when extrinsically motivated (Reeve, Deci, & Ryan, 2004).

Self-Determination Theory and Motivation in Online Contexts

Recent research (Chen & Jang, 2010; Hartnett, 2010) has demonstrated that self-determination theory provides a useful analytic tool for exploring the complexity of motivation in online contexts. Studies that have adopted this framework are few but starting to appear (Martens et al., 2004; Rovai et al., 2007; Shroff et al., 2007; Shroff et al., 2008; Xie et al., 2006). However, one notable limitation of these studies has been the tendency to focus only on intrinsic motivation. In doing so, the power of the model to explore a broader range of motivation, particularly more autonomous types of extrinsic motivation, has been neglected. This is important because previous research in face-to-face contexts (Lepper et al., 2005) has found that high levels of more self-determined motivation (such as identified regulation) may *act as a buffer* against the more detrimental effects of external constraints.

This paper presents findings of one aspect of a larger study (Hartnett, 2010) that explored the motivation of preservice teachers situated within two separate and different online distance-learning contexts, using SDT to underpin the investigation. Results presented here address the question, *What is the nature of motivation to learn in online contexts?*

Research Method

Case Studies

Case-study methodology was used to explore the complex phenomenon of motivation in a manageable way to advance understanding (Yin, 2009). Purposive sampling methods (Patton, 2002) were used to select two information-rich cases. Even though the broader institutional context was beyond the scope of the wider study, the impact such influences can have at the situational level has been noted previously (Vallerand & Ratelle, 2002). Therefore, potential cases were identified from the same programme within the same institution in order to reduce differential contextual influences at the institutional level. Cases were chosen based on predetermined criteria of importance to ensure relevance to the research question (Patton, 2002). In particular, 1) courses were required to be predominantly web-based, with only limited resources provided by alternative methods, such as print; and 2) course expectations required students to participate within the online learning community as an integral part of assessed coursework.

Procedures

Preceding the collection of data, ethical consent to undertake the study was obtained. Data collection procedures comprised online questionnaires, interviews, archived online data (including online asynchronous discussion transcripts and usage statistics), achievement data, and course resources. Findings presented here draw on a subset of the data collected

via the online questionnaires that were administered after the relevant learning activities had been undertaken. The questionnaire contained three sections: demographic information, a self-report motivation scale, and open-ended questions designed to explore possible relationships between social and contextual influences and learners' motivation. The self-report motivation data is the focus here.

Motivation Measure

Learner motivation was measured using the self-report situational motivational scale (SIMS) developed by Guay, Vallerand, and Blanchard (2000), which operationalises elements of the SDT continuum described earlier (see Figure 1). It measures situational intrinsic motivation, extrinsic forms of motivation (external regulation and identified regulation), and amotivation. Participants were asked to respond to these questions in relation to a specified assignment, and its associated online activities, within each course. Each of the four motivation subtypes was measured using 7-point Likert scales, with four questions for each motivation subscale. For each participant, these subscale scores were then used to calculate a single motivation score called the self-determination index (SDI). This follows the weighted calculation described and used in previous research (Ratelle, Baldwin, & Vallerand, 2005; Vallerand & Bissonnette, 1992; Vallerand & Ratelle, 2002). SDI scores can range from a minimum of -72 to a maximum of +72. While the calculation of the SDI is a useful indicator of overall motivation, subscale scores were also analysed as the SDI may not account for participants' endorsement of more than one type of motivation for engaging in an activity (Vallerand, Pelletier, & Koestner, 2008).

Data Analysis

Yin (2009) argues that while qualitative methods and data remain central in case-study research, quantitative data and analysis can add to the overall picture of the case. This is the perspective adopted throughout the investigation described here. Nonparametric statistical calculations were performed because of the small sample size within each case study and the inclusion of ordinal scores in the SIMS motivation scale (Guay et al., 2000), and because normality could not be assumed in the underlying population (Siegel & Castellan, 1988).

Context and Participants

The two courses that provided the context for the case studies were situated within the larger context of a preservice teacher education programme at a New Zealand tertiary institution. Students in this programme were preparing to teach in New Zealand primary (i.e., elementary) schools. These courses were considered Internet-based rather than fully online because students received some print material (study guide in both case studies) and digital resources (CD-ROM in case study one) at the beginning of their course. The online learning platform used was the WebCT learning management system. The boundary for each case study centred on one assignment and its associated online activities. In both case studies, all participants had similar prior experience of online learning and group assignments.

While both cases were chosen from courses within the same programme, the instructional

design of each was different. Case study one was situated within a compulsory integrated science and technology course. Teaching staff consisted of a course coordinator with science expertise and a tutor with technology expertise. The tutor was responsible for the majority of the online teaching. Students typically took this course in the third and final year of their degree. The case study itself focused on a problem-based learning (PBL) assignment worth 60% of the final mark. This was undertaken over a six-week period in which students were required to work collaboratively in small groups. PBL is an instructional approach built around authentic, ill-structured problems that are complex in nature (Schmidt & Moust, 2000).

Case study two was positioned within an introductory social studies curriculum course that formed a compulsory component of the same programme. Students usually took this course in the second year of their degree. An individual microteaching and reflection assignment (with associated online activities), which required students to plan and teach two consecutive lessons in a school of their choice and then reflect on their experience, formed the boundary for case study two. Students completed this assignment over a four-week period, and it was worth 40% of the final mark. The course coordinator was responsible for all online teaching throughout the semester.

A total of 21 student participants took part in the two case studies (12 in case study one and 9 in case study two) and were recruited from the semester one (February–June) 2008 online distance offering of each course. Participants were located throughout New Zealand and undertook their courses at a distance from the main campus. The respondent group, matching the general demographics of the courses, comprised 2 males and 19 females (1 male in each case study). Participants' ages ranged from 18 to 55, with 90% in the over-24 age group. We should emphasise that the information and statistical data reported here are included to enrich the wider study and explicate the findings. This was a qualitative study to discover whether and what kind of different motivations existed in these learners, not to generalise to the wider population of online learners.

In the sections that follow, participants' results for all motivation types (SIMS subscale scores) and self-determination index (SDI, a composite measure of motivation) scores are presented and discussed with reference to the broader investigation.

Results

Case Study One

Case study one situational motivation scale (SIMS) responses and SDI scores for each student participant are summarised in Table 1. A positive SDI score indicates that, overall, more self-determined forms of motivation are predominant, while a negative score indicates an overall experience of less self-determined motivational types (Vallerand & Ratelle, 2002).

With half of the case study one participants having positive SDI scores and half having

negative scores, it is apparent that the nature of motivation to learn is diverse among this group. For those with positive SDI scores, in general, more internalised forms of motivation, namely identified regulation (IR) and intrinsic motivation (IM), were prominent. This indicates that these participants perceived the activity to be worthwhile and valuable (an indicator of identified regulation) and interesting or enjoyable (an indicator of intrinsic motivation) to some degree. Conversely, learners with negative SDI scores generally reported experiencing more externalised forms of motivation. These included external regulation (ER), signifying they were complying with external demands, and amotivation (AM), indicating they lacked motivation due to a perceived lack of relevance or competence.

Table 1

Case Study One Participants' SIMS and SDI Scores

ID	SIMS Subscale Scores				Weighted Sum
	Amotivation (AM)	External Regulation (ER)	Identified Regulation (IR)	Intrinsic Motivation (IM)	SDI Score
S2	5*	8	22	19	42
S8	4	16	22	22	42
S4	4	15	26	18	39
S10	4	8	20	15	34
S9	8	16	22	20	30
S3	4	27	20	22	29
S6	13	28	19	14	-7
S11	20	28	23	19	-7
S1	21	18	13	13	-21
S7	24	24	14	16	-26
S12	16	28	9	10	-31
S5	27	28	4	4	-70
MEDIAN (Mdn)	10.5	21	20	17	11
INTERQUARTILE RANGE (IQR)	16.25	12.25	8.25	5.5	57.5

* Participant subscale scores can range from a *minimum* of 4 to a *maximum* of 28.

Several notable points also emerged for the case study one group's SIMS subscale scores

(see Table 1). Overall, participants reported being motivated 1) toward complying with requirements and/or reacting to external demands (*ER Mdn* = 21), and 2) by the utility value and relevance of the task (*IR Mdn* = 20), as well as (and slightly more than) by the interest or enjoyment (*IM Mdn* = 17) experienced while undertaking the PBL assignment. Furthermore, several of the participants also reported a high degree of amotivation. In other words, participants did not exclusively report only one motivation subtype.

Case Study Two

SIMS subscale response (SDI) scores for case study two participants are summarised in Table 2. All participants had positive SDI scores ranging from 16 to 54.

As with case study one, those participants with the highest SDI scores tended to report higher levels of identified regulation (IR) and intrinsic motivation (IM) and lower external regulation (ER) scores. Almost all participants reported low amotivation scores (a contributing factor to the positive SDI scores).

Table 2

Case Study Two Participants' SIMS and SDI Scores

ID	SIMS Subscale Scores				Weighted Sum
	Amotivation (AM)	External Regulation	Identified Regulation	Intrinsic Motivation	SDI Score
S2	4	15	27	25	54
S3	4	15	24	23	47
S9	8	12	23	26	47
S7	4	28	25	22	33
S8	14*	22	27	25	27
S4	4	26	23	16	21
S6	5	28	23	18	21
S1	8	28	21	20	17
S5	4	18	16	13	16
MEDIAN (Mdn)	4	22	23	22	27
INTERQUARTILE RANGE (IQR)	4	13	2	7	26

*S8's amotivation score was not supported by her interview, open-ended questionnaire responses, and asynchronous discussion data. This may be due to a misunderstanding as English is her second language.

Turning to the subscale results, the low amotivation scores indicate that participants found value in the task and felt reasonably competent in undertaking it. The value, relevance, and importance of the task to participants (i.e., the opportunity to practise teaching social studies within an authentic context) were further reflected in their identified regulation scores. These ranged from moderate to high for the majority of participants within the group, resulting in a high median identified regulation score (*IR Mdn* = 23) and a narrow interquartile range (*IQR* = 2).

But identified regulation was not the only motivation subtype that was strongly endorsed by this group. High levels of external regulation (*ER Mdn* = 22, i.e., complying with external requirements, such as deadlines) and intrinsic motivation (*IR Mdn* = 22, i.e., experiencing interest and/or enjoyment) were also reported by participants, which clearly demonstrates the multifaceted nature of participants' motivation to learn within this context.

Cross-Case Analysis

SDI Results—A Composite Measure of Motivation

The relatively low median self-determination index score for the case study one participant group (*SDI Mdn* = 11, see Table 1) suggests that higher quality, more self-determined types of motivation were only slightly more evident than the traditional type of extrinsic motivation—external regulation (Ryan & Deci, 2000) and amotivation. In comparison, the median SDI score for the case study two participant group (*SDI Mdn* = 27, see Table 2) was noticeably higher, suggesting that autonomous types of motivation (i.e., identified regulation and intrinsic motivation) were more prevalent.

These results suggested noticeable differences in SDI scores between the two cases, but statistical comparison indicated they were not significant. While the calculation of SDI scores was useful, it is a composite indicator of motivation and can therefore hide individual endorsement of more than one type of motivation, as Vallerand et al. (2008) have noted. Exploring the different types of motivation across the two cases provided a more multilayered picture of the nature of motivation.

SIMS Results—Motivation Subtypes

A number of notable patterns of motivation emerged from comparisons of the SIMS subscale scores across the two case studies (see Table 3). While some similarities were evident, several important differences between the two contexts were observed. Although it appears that median amotivation scores between the case studies were quite different (see Tables 1 and 2), statistical comparisons indicated that the two groups' amotivation scores did not differ significantly (see Table 3).

Table 3

Mann-Whitney U Results Comparing SIMS Subscale Scores across the Cases

	Amotivation (AM)	External Regulation (ER)	Identified Regulation (IR)	Intrinsic Motivation (IM)
Mann-Whitney <i>U</i> (2-tailed)	32.5	52.5	19.5*	25.0*
Effect size (<i>r</i>)	-.35	-.02	-.54	-.45

* $p < .05$

Similarly, there was no significant difference in external regulation scores (see Table 3), with both groups reporting moderately high levels. This indicates that in both contexts learners were motivated by some aspects within the learning and teaching system that were not within their control. The wider study indicated that the differing nature of the activity, the roles played by the lecturers, and the support given by peers in the two cases did not significantly affect the external regulation scores reported by each group. It is likely that features common to both tertiary online contexts were influential. For example, students in both case studies were aware of the importance of meeting assignment deadlines and gaining passing grades in order to make progress toward attaining a degree.

While some amotivation occurred in both cases and external regulation scores were similar for both groups, results reported for more self-determined types of motivation (identified regulation and intrinsic motivation) were significantly different (see Table 3).

Differences in identified regulation scores indicate that students situated within the context of case study two experienced the microteaching activity as significantly more important and meaningful compared with case study one participants' experiences of the PBL activity. The open-ended questionnaire data supported by interview data suggested that the major reason for this was the perceived relevance of the task to the learners' goals. While all case study two participants found the microteaching activity relevant (both professionally and personally), only half of the case study one participants saw the relevance of the PBL assignment to their needs. In fact, the remainder actively questioned the purpose of completing the PBL activity.

Situational differences were also apparent in relation to intrinsic motivation. Case study two participants reported significantly higher intrinsic motivation than those in case study one (see Table 3). All case study two participants highlighted situational interest (generated by certain factors within the learning environment) as influencing their intrinsic motivation. In contrast, only around half of the case study one participants experienced situational interest in the PBL context. For the rest, other factors within the environment undermined interest and therefore intrinsic motivation (Hartnett, 2010).

Collectively, SIMS subscale results show that participants in both case studies reported

varying degrees of amotivation, external regulation, identified regulation, and intrinsic motivation. Importantly, in both tertiary online learning contexts investigated, perceptions of external regulation were present alongside more self-determined forms of motivation (identified regulation and intrinsic motivation). This supports the argument for looking more closely at multiple types of motivation rather than just intrinsic or extrinsic motivation. A person can be motivated for several different reasons, and these may not be mutually exclusive. In addition, case study two participants reported significantly higher identified regulation and intrinsic motivation than case study one participants. In other words, the intrinsic motivation of case study two participants was not lowered by the general external constraints and demands (external regulation) salient in the tertiary environment. This was not the case for case study one participants.

An explanation for this can be found in the multiple influences that case study one participants highlighted in the immediate learning environment, which undermined their motivation to learn (see Hartnett, 2010). For example, perceptions of the high-stakes nature of the PBL task, perceived lack of relevance, and insufficient lecturer guidance were all identified in interviews and questionnaires as factors that combined in intricate ways to dynamically undermine participants' motivation. In contrast, relatively few influences were identified in the case study two context that undermined motivation. Instead, other considerations in the broader tertiary context (e.g., time constraints due to other responsibilities outside the immediate study situation) were predominantly responsible for the high external regulation scores. Jointly, these findings demonstrate that in these contexts *motivation to learn is complex, multifaceted, and situation-dependent*.

General Discussion

This was a qualitative study: The research results are associated with two specific contexts, and the sample sizes in both case studies are small, which limits the transferability or usefulness of the findings to other online practitioners in diverse settings. What this study does demonstrate is that motivation in such contexts results from a complex interplay between individuals and the environment in which they are situated.

The participant motivation data presented here is cross-sectional in nature. By adopting this type of approach, motivational changes (in terms of the motivation subscales) among learners across the duration of the activity, course, or programme were not visible. It was therefore not possible to observe variations that probably did occur throughout each course. While different motivational patterns may have occurred over time, this does not invalidate the results. Whether or not the various types of motivation co-existed or occurred sequentially, the central point is that motivation is not a one-dimensional trait, but is complex, multifaceted, and influenced by both person and context. For example, unavoidable influences embedded within tertiary contexts, such as grades and time constraints, were shown to influence the motivation of *some* learners, resulting in the reporting of high external regulation scores *as well as* more autonomous types of motivation.

The fact that these students were studying to become teachers might suggest that the microteaching activity (i.e., case study two) would be viewed as more motivating because it more directly aligned with their perceptions of what that future role would involve. However, the differences between the two assignment contexts alone did not account for the diversity in motivation reported by participants across the case studies. This was revealed from the qualitative data, where relevance to future teaching practice featured in *both case studies* as supporting motivation to learn (i.e., identified regulation). Furthermore, the same features of the learning environment, within the same learning context (i.e., case study one), supported the motivation of some learners and undermined others. This suggests that the nature of motivation to learn is a complex mix of person-context interactions.

The situated nature of motivation should not be surprising. To focus on a limited subset of the learning experience such as the technological aspects makes little or no sense. Whether the context is online or face-to-face is of very limited significance to motivation when compared with factors such as whether the learners' goals and interests align with the subject of study, whether sufficient support and guidance is provided to meet those goals and interests, and so on. The same is true of comparisons that only consider pedagogical models and processes: These are only tools and, like any tool, may succeed or fail depending on how they are used and on differences in the surrounding context.

Motivation was also revealed to be multidimensional. Within a given context, learners were shown to be motivated in many different ways as they engaged in online learning activities around an assignment. A range of extrinsic motivations (i.e., external regulation and identified regulation) as well as intrinsic motivation occurred in varying degrees that differed depending on the online environment in which learners were engaged (i.e., motivation was influenced by situational factors).

Importantly, it was not whether learners were extrinsically motivated in the traditional sense (i.e., externally regulated) that was important because there were influences embedded within educational contexts that were unavoidable (e.g., deadlines and grades). Rather, it was the degree to which this type of extrinsic motivation was counterbalanced by more self-determined types of motivation (i.e., identified regulation and intrinsic motivation) that was crucial to the overall motivation of learners.

Conclusion

Previous research has suggested that online learners tend to be intrinsically motivated. While there is some support for that assertion in this study, it does not represent the whole picture. Instead, both intrinsic and extrinsic types of motivation were found to co-exist and were highly sensitive to situational influences. Taking into consideration the different types of motivation, participants across the two cases reported moderate to high levels of multiple types of extrinsic motivation (i.e., external regulation and identified regulation). Only case study two participants also consistently reported similarly high levels of intrinsic motivation. Therefore, from a quality motivation perspective, the perceived importance,

relevance, and utility value of the activity (associated with identified regulation) were just as important as the interest or enjoyment of the task (associated with intrinsic motivation).

While we should be wary of generalising, these findings clearly show that motivation can be a complex and multifaceted phenomenon that cannot be fully explained from the perspective of motivation as either a learner characteristic or an effect of learning environment design. This has important implications for online instructors. While intrinsic motivation constituted an important part of students' motivation to learn in the contexts described here, identified regulation (i.e., recognising the value and importance of the activity) was also important.

Therefore, practitioners need to be cognisant of the important role they play in influencing learner motivation when designing learning activities. Most importantly, the relevance and value of the task (e.g., online discussions) need to be clearly identified and linked to learning objectives to help learners understand how the activity can aid in the realisation of personal goals, aspirations, and interests, both in the short and longer term. By offering meaningful choices (i.e., not just option choices) to learners that allow them to pursue topics that are of interest to them, the perceived value of the activity is further enhanced. Finally, by establishing frequent, ongoing communication with learners, where they feel able to discuss issues in an open and honest manner, practitioners are in a better position to accurately monitor and respond to situational factors that could potentially undermine learner motivation.

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Factors that Impact Student Usage of the Learning Management System in Qatari Schools



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Abstract

In an attempt to enhance teacher and student performance in school, a learning management system (LMS) known as Knowledge-Net (K-Net) was introduced in Qatari independent schools. (All public schools in Qatar have transformed to independent schools; the independent schools model is similar to the charter school system in North America.) An LMS is a tool that organizes and regulates classroom administrative tasks, supports teachers and students in the teaching and learning process, and informs parents of their children’s progress and school activities. Despite the benefits of the LMS, research studies indicate that its use by students has been limited because of a number of *manipulative* and *non-manipulative factors* that can influence behavior. This study explores the factors that impact student use of the LMS K-Net in Qatari independent schools. Quantitative data were collected through a questionnaire that was administered to students in 37 schools. A total of 1,376 students responded to the questionnaire. Semi-structured interviews were used to collect qualitative data that helped to confirm the results of the quantitative data and to provide additional insight on students’ perspectives regarding the use of the LMS. The results point to a strong relation between ICT knowledge and LMS usage. They suggest that the more ICT knowledge students have, the less prone they are to using the LMS. Attitudinal barriers were not predictive of usage. Student usage was strongly correlated to teacher and parent usage. This study is informative in evaluating LMS usage in Qatari schools.

Keywords: Learning management system; student usage; barriers; knowledge of ICT; Qatar

Introduction

Information and communication technologies (ICTs) have changed the nature of global interactions and educational practices (Economist Intelligence Unit Limited, 2001). Centered around business (Hollenstein, 2004; Baldwin, Sabourin, & Smith, 2004), ICT has been adopted in both the public and private spheres and is intensively used in educational institutions (ten Brummelhuis, 2001, as cited in Drent & Meelissen, 2008). This has created a situation in which ICT affects all educational stakeholders: educators, parents, and students. Although information communication and knowledge-sharing are changing traditional concepts of schooling, the implementation of ICT in schools has been inconsistent (Fahey, 2000). Research suggests that, despite the barriers, online and mobile learning is touted as the newest and best educational practice to remedy the difficulty of access to quality education (Sener & Stover, 2000).

The current generation of ICT development, known as a learning management system (LMS), is designed to organize and regulate the administrative tasks of schools and other organizations (Esther, 2008). According to Watson and Watson, an LMS provides “functionalities beyond instructional content such as management tracking, personalized instruction and integration across the system” (2007, p. 28). An LMS can effectively support instruction and facilitate learning using an organized “learning structure” to provide support for teaching and learning (Song, 2004; Uzunboylu, Ozdamli, & Ozcinar, 2006). In addition, an LMS continues well beyond the classroom through emails, discussion groups, student–teacher question–and–answer sessions, the transfer and posting of administrative information, and course content (Kim & Lee, 2008). Most of these activities are done on a daily basis by students using the computer, Internet, and email, but an LMS facilitates them through a carefully managed system (Cox et al., 2004; Somekh et al., 2002). LMSs help teachers achieve instructional goals through a number of activities that traditionally occur in the classroom. Thus, ICT integration strives to build a learning community among the school stakeholders and partners (Sabherwal & Newman, 2003). Despite the benefits of LMS, studies have been limited to teacher usage and have only been defined in terms of actual real-time and functional usage.

The LMS in Schools

An LMS is currently used extensively in Asian countries (Bonk, Lee, & Reynolds, 2009) and in Gulf Cooperation Council countries (Dutta & Mia, 2011). The Edunet system, a teaching/learning portal that is described as a comprehensive education information service, was launched in 1996. On the use of this system in the Far East, Chang (2005) indicates that in 2003, 80% of all teachers and 41% of all students in South Korea had subscribed to Edunet. Thailand has a similar system (Portal for Education) and so does Singapore (Smart Schools). These systems provide curricula through an integrated electronic wireless network that enables teacher, student, and parent interaction.

As a means of managing Jordanian schools that are crowded with Iraqi refugees from the Second Gulf War, the Discovery School Initiative began in 2003 for K-12 public schools in and around the capital city of Amman. The goals of the project were to upgrade tech-

nology infrastructure, expand computer labs, provide Internet connections, create digital curricula, and support the integration of technology and e-learning resources. At present, there are 100 discovery schools, and the introduction of the system to all 2,300 government schools is underway. In Qatar, Knowledge-Net (K-Net), an educational portal, assists in the development and use of ICT in teaching and learning. It supplies schools with a learning management system to improve the delivery of educational content and accessibility to resources. Although introduced widely throughout the world, the technology does not ensure that it is fully used by stakeholders. Therefore, a need to investigate exists in order to determine whether the stakeholders use the technology as intended, and to what extent.

The LMS in Qatar's Context

In 2004, the Government of Qatar established the Supreme Council of Information and Communication Technology (ictQATAR) to regulate and encourage the use of technology. ictQATAR is responsible for creating an advanced, knowledge-based society through ICT infrastructure and skills development. One of the ictQATAR initiatives has been to promote ICT in schools. An outcome of this initiative was the development of K-Net as a school-based LMS for data storage, sharing, and data administration that improved content delivery, facilitated resource accessibility, enhanced communication, and expedited administrative tasks. K-Net also connects students, teachers, administrators, parents, and ictQATAR. In 2008, K-Net was initially introduced to 37 schools, and the plan was for the K-Net portal to be introduced to all independent schools (approximately 164 in total) in the State of Qatar.

Barriers to LMS Usage

The benefits of LMS usage are numerous. However, there are many barriers that prevent their full adoption in schools (Drent & Meelissen, 2008). Students often complain about their lack of knowledge of ICT and state that teachers provide little support in that area (Drent & Meelissan, 2008). Some of the student barriers identified by Selim (2007) include instructors' attitudes and teaching styles, student motivation, student technical competency, student-student interaction, ease of access to the technology, infrastructure reliability, and lack of support at the postsecondary level. Likewise, Becker (2000) found the following barriers to technology use: (a) some older teachers were prone to teach using traditional means, (b) novice teachers with limited training were less likely to use the technology, (c) a lack of commitment to a constructivist pedagogy, (d) a lack of available professional development, and (e) a low level of contact between teachers who have little experience using technology. Mulkeen (2003) suggests that infrastructure barriers such as those presented by equipment and processing requirements have raised substantial arguments against their full use, stating that these barriers are not limited to external factors but also include internal ones, such as attitudinal barriers. Some users consider themselves confident and knowledgeable in the use of ICT; whereas, others are more uncertain and hence have a greater propensity to reject the technology in their classrooms (Looker & Thiessen, 2003).

In recent years, a plethora of studies have examined teacher use of ICT, but little has emerged on student usage. The perceived functionality and usefulness of ICT are key factors in student usage. Pituch and Lee (2006) observed that the strongest influences on student

use of an LMS were the system characteristics and their perceived functionality. Hayashi, Chen, Ryan, and Wu (2004) confirmed this finding and argued that perceived usefulness and satisfaction could directly influence LMS usage. Furthermore, these researchers found that user satisfaction takes precedence over perceived usefulness in terms of the expected usage. Heath and Ravitz (2001), cited in Gibbs, Dosen, and Guerrero (2009), found that student academic success is related to access to technology. Likewise, a review article on barriers to assistive technologies revealed that funding and technology access appear to be the most pressing barriers (Copley & Ziviani, 2004). However, Mulkeen's (2003) Irish study found that the increased supply of equipment such as computers, servers, and hubs does not increase the usage of these technologies. ICT context and setting are not only tied to the equipment that exists in schools, there are also organizational, physical/technical, and practical factors that may inhibit implementation (Becker, 2000). For example, the existence of a culture of technology in the workplace encourages its use in schools (Rochelle, Pea, Hoadley, Gordin, & Means, 2000). School vision, mission, and philosophy also impact the use of technology. Whereas some schools might stress problem-solving, others might consider these technologies remedial methods to teach basic skills. The variation in schools, depending on whether there is a culture of mastery or constructivist problem-solving, characterizes each institution's e-maturity (Morocco & Zorfias, 1988). Students and other stakeholders indicated that one of the reasons why students lack technological skills is because administrators, teachers, and parents may not be convinced of the benefits of technology in schools or might not think it is integral to the educational process (Brown-Yoder, 2001).

A large Canadian study showed a direct correlation between fathers' education and students' ownership and use of the home computer and other kinds of technology. Parents who are not educated technologically are less likely to have children who use the Internet and email or who engage in data entry, make spreadsheets, write computer programs, and use graphic programs. Likewise, a US study by Martinez (1994) found that those who have access to technology at home are more likely to use it in school than those who do not. Educated parents are more likely to instill in their children the importance of ICT use (Looker & Thiessen, 2003).

Teachers also play an important role in influencing students with instructional practices that motivate them to use ICT. Furthermore, student-perceived teacher expectations are strongly associated with ICT usage (Vekiri, 2010). Specifically, when teachers integrate technology into their classroom and encourage students to learn basic skills such as generating spreadsheets, making PowerPoint presentations, and using digital cameras and word processing software, there are fewer barriers to student use of these technologies and increased usage (Gibbs, Dosen, & Guerrero, 2009). However, barriers extend beyond the external factors that limit direct access to the technology. Other elements, known as manipulative or endogenous factors, include things such as school attendance, attitude, and level of achievement, contribute substantially to student usage (Slavin, Karweit, & Maddin, 1989). However, these factors have rarely been integrated into studies of impact on usage.

Manipulative and Non-Manipulative Factors

A conceptual model has been developed by Ely (1999), Grunberg and Summers (1992), and Mumtaz (2000) to explain factors that impact usage. They distinguish between *non-manipulative* and *manipulative* school factors. Non-manipulative factors are ones that are not influenced by the school, such as the ages of students and teachers, national reform, ministerial funding, and teacher job experience. These factors include the lack of and unreliability of equipment and technical support needed. The second-order barriers include school culture, attitudes, and beliefs, and these manipulative factors are human ones that can be managed and changed. These factors can also be observed and include the attitudes of teachers toward teaching and ICT, the ICT knowledge and skills teachers have, and school ICT policy.

In the further development of these dichotomous factors, Drent and Meelissan (2008) referring to ten Brummelhuis (1995) suggest that these manipulative and non-manipulative factors are interrelated and are particularly dependent on teachers and schools. In other words, there are interrelated school and teacher attributes, such as the age of the teachers (non-manipulative) that influence policy and could impact teacher beliefs. Experienced teachers have a greater influence on policy development and thus are more likely to influence school policymakers and possibly bring about the necessary changes in thinking (manipulative).

The same concept was developed by Snoeyink and Ertmer (2001), including barriers as external (first order) and internal (second order), which reflect the non-manipulative and manipulative respectively. The proposition of this study is that non-manipulative school factors, such as context, norms, teachers, and parents, affect students' usage. This in turn may influence the behavioral intention of students, affecting their beliefs and attitudes. In the current study, we examined student perceptions of the resources at home and at school (a non-manipulative factor), student perceptions of barriers and knowledge (manipulative factors), and attitudes related to barriers and knowledge on usage (a manipulative factor).

Knowledge of the LMS and Usage

A prevalent discourse in the ICT literature about those who have the knowledge ("haves") and those who lack it ("have-nots") suggests that there is asymmetric ICT distribution in societies or nations with developing economies. The argument goes that the digital divide appears to be a larger social phenomenon and educational problem (Atwell, 2001). Scholars who take part in this discourse also note that more than half of the world's children lack basic ICT resources, and there is widespread agreement on the relevance of ICT in developing economies (Walsham & Sahay, 2006). The belief is that those who lack this knowledge will never be able to close the gap in technological knowledge and access, and that this new form of illiteracy will be more prevalent and costly to remedy than others. It is argued that those who have ICT knowledge are likely to have an advantage over those who lack it. More importantly, attitudes toward the behavior and how it is perceived could lead to the formation of a behavioral intention. Favorable attitudes and behavioral control result in a positively perceived behavioral outcome and a stronger intention to perform the behavior

in question.

LMS Usage

In terms of usage, we shift the concept from being subjective, as in perceived usefulness, to objective (Al-Senaidi, Lin & Poirot, 2009). We observe specific measures of usage in the number of logins, time of logins, and requests made to the technical staff. Specifically, we examine LMS usage among students as a metric and objective measure. We also define attitudes toward the behavior in terms of barriers, both manipulative (e.g., interest, skills, or knowledge) and non-manipulative factors (e.g., lack of Internet access), hindering students' full use of the ICT system. Knowledge is defined as the level of student skill in various information communication technologies, including email, Internet, PowerPoint, and other utilities. In addition, knowledge includes skills in the use of LMS components such as uploading, downloading, chats, and discussion forums.

Aims of the Study

This study focuses on student LMS usage. In particular, it centers on student LMS/ICT knowledge and the effect of barriers on that usage. The study explores the following questions.

- How do students respond to questions regarding barriers and knowledge?
- What is the predictive power of manipulative and non-manipulative factors, and what is their relationship to attitudes, subjective norms, and belief systems on LMS usage?
- Are perceived barriers (manipulative or non-manipulative) the main predictors of usage of LMS?

Methods

Procedure

Survey and interview questionnaires were the main methods of data collection. The survey data were collected using the online survey collector Survey Monkey™. Technical staff from the Ministry of the Supreme Council of Information and Communication Technology (ic-tQATAR) connected the Survey Monkey™ questionnaire to the K-Net LMS. Once students logged into the LMS, they were prompted to respond to the questionnaire. To increase the number of responses, the researcher met with the project managers (information technology personnel at the schools), introduced the study, and distributed the questionnaire so that the managers became familiar with the type of questions the students were being asked. The project managers who managed the LMS in all 37 schools were instructed to remind students and teachers of the questionnaire. Because many of the project managers also taught the students ICT skills, they were asked to set aside a time for students to respond to questions in class. Project managers regularly reminded teachers to encourage

their students to respond to the questionnaires. The students (respondents) were reassured that there was no right or wrong response, but that the researchers were seeking their opinions on the different aspects of the LMS and that complete confidentiality would be maintained at all times. A total of 1,376 students responded to the questionnaire.

The questionnaire used in this study examines the two main factors of student-perceived barriers and students' knowledge. It is constructed of statements from previously published questionnaires from the Texas Center for Educational Technology at the University of Northern Texas and item domains established by Kuhlemeier and Hemker (2007). Selected items address knowledge and barriers and have previously been used to evaluate ICT. These items have been used and validated in various contexts by their source authors.

The questionnaire item responses were constructed on a four-point Likert scale from *often used* (=4) to *never used* (=1). The attitude subsection of the questionnaire used ratings ranging from *strongly agree* (=4) to *strongly disagree* (=1). The questionnaire was printed in English and Arabic on the same form. The English items were translated by a committee cross-translation method widely used to translate an instrument from a source language (English) to a target language (Arabic) (Nasser, 2005). Three translators were asked to translate the items, and the translations were validated by bilingual judges.

Interview Questions

Qualitative data were acquired through semi-structured interviews with individuals and focus groups. The research team visited five selected schools and conducted interviews with students. The selection of schools was based on student and school usage data.

An announcement about the study was made to the students on the LMS. Five schools responded to the researchers' call for interviews, and a total of 21 students were interviewed. The purpose of these interviews was to gather data related to experiences and perceptions of LMS use. Interviews were conducted using a guide that contained a series of open-ended questions (see Table 1). Based on the participants' responses, probing questions were asked to increase information, allowing us to gain a thorough understanding of the participants' perspectives and the reasoning behind their responses. We identified trends, themes, and patterns (Kreuger, 1988). As new topics developed, focus groups were asked to discuss the issues or express their viewpoint on this new information. The questions asked by the researchers are listed in Table 1.

Table 1

Interview Questions

Leading Student Questions
1. Have you worked on ICT projects using the LMS?
2. Have you learned a lot using the LMS?
3. What are the things in the LMS that you would like teachers and others to use?
4. What other skills would you like to learn from (about how to use, or in order to use) the LMS?
5. What are the main barriers that you face using the LMS?

The interview with students continued until data saturation occurred. Saturation means that no matter how much more data are collected, there would be no new dimensions or properties to develop further categories. Once saturation was evident, we began to interpret our findings and developed the discussion, backed by the survey data. After a close analysis of participants' responses to the interviews, the information was categorized according to topics predominantly derived from the data. Finally, the findings were merged with the quantitative data into a tightly woven account resembling the reality of LMS usage.

Secondary Data

As mentioned earlier, the technical provider of the LMS provided the researchers with student LMS usage, and these data were merged with the survey responses. Once a student completed the survey at school, the usage data for that individual included the number of uploaded documents, average student hits (i.e., logins), duration of logins, and requests made to the help desk run by the Information Technology School Support Team. Data on usage were also collected for teachers, administrators, and parents. A correlational analysis was performed between all stakeholders (students, teachers, and parents) to determine association patterns between the different stakeholders, providing further evidence and supporting latent correlations. These data are available and easily provided by Maloumatia, a publicly funded company that developed the learning management system Knowledge-Net (K-Net). The correlations provide general information on usage.

Variables and Limitations

Two independent variables were conceptualized in this study, namely perceived knowledge and barriers (for knowledge items see Table 2, items 1–15; for barrier items see items 16–21). The dependent variable is student usage of the LMS. Our intent was to build a path model linking these variables as attitudes and barriers to the knowledge of students; however, it was nearly impossible to operationally link usage with their responses to the questionnaire as the LMS (K-Net) does not track usage among end users. Therefore, the researchers used school usage rather than student usage when conducting the regression analyses. Other stakeholders, teachers and parents, are equally important to the effective use of the LMS. These will be included in a fully developed model once the results of the current study are analyzed.

Statistical Analysis

To examine the data, several statistical methods were used. The first analysis involved descriptive statistics based on the responses to the items on the questionnaire. In the second analysis, we ran a correlation to determine the association between student and parent usage and between student and teacher usage. Third, we ran an exploratory and confirmatory factor analysis to obtain reliability and validity measures for the knowledge and barriers items of the questionnaire. The explanatory factor analysis was conducted to examine the factor structure of the survey instrument. To determine reliability, we evaluated the internal consistency of the items representing each factor using Cronbach's alpha.

The items in the student questionnaire were factor analyzed using principle component analysis with unities in the diagonal, an Eigen cutoff value of 1.0, and a varimax rotation (Tabachnick & Fidell, 2007) to validate the factors formed before the two main factors of knowledge and perceived barriers to student usage. To validate the reliability of each scale, we calculated using a Cronbach's alpha. Finally, three regression analyses were performed. The first analysis addressed the ICT/LMS knowledge and barriers as predictor variables. We separated the knowledge scale into two variables and ran a second and third regression analysis based on them. The second regression analysis addressed ICT knowledge and barriers as predictor variables on usage. The third regression analysis addressed the knowledge of LMS and barriers as a predictor variable on usage. The regression analyses were performed using the school as the unit of analysis. Because the usage was provided for each school at an aggregate level, student-rated barriers and knowledge were averaged for each school such that each was assigned its measure based on students' average ratings for these variables.

Results

Descriptive Findings

In terms of knowledge, most of the students who responded to the questionnaire used ICT and LMS technologies to communicate and work on specific applications, as evident from items 1 to 15. Students indicated there were few barriers in terms of the availability of technologies. However, they argued that there was little time at school to use the LMS. In addition, there was an equal number of respondents who felt that the LMS was overly difficult to use or who did not know how to use it.

Table 2

The Survey Questionnaire: Responses and Percentages

How often do you do the following activities?	Often	Sometimes	Rarely	Never
Use the computer for class work or homework	421(37.2)	508(44.9)	148(13.1)	55(4.9)
Use the Internet for homework	367(32.4)	447(39.5)	225(19.9)	93(8.2)
Communicate through email	461(40.7)	278(24.6)	205(18.1)	188(16.6)
Participate in chats on the Internet	412(36.4)	298(26.3)	220(19.4)	202(17.8)
Find information on the Internet	606(53.5)	370(32.7)	107(9.5)	49(4.3)
Upload files to the Internet	441(39.0)	365(32.2)	207(18.3)	119(10.5)
Make a PowerPoint presentation	357(31.5)	378(33.4)	272(24.0)	125(11.0)
Use graphics in a PowerPoint presentation	498(44.0)	341(30.1)	189(16.7)	104(9.2)
Use sound in a PowerPoint presentation	330(29.2)	327(28.9)	310(27.4)	165(14.6)
How often do you use the LMS for each of the following activities?				
Group projects	319(28.2)	380(33.6)	235(20.8)	198(17.5)
Research	468(41.3)	362(32.0)	164(14.5)	138(12.2)
Homework	32(38.2)	371(32.8)	176(15.5)	153(13.5)
Communicate with your teacher	534(47.2)	259(22.9)	204(18.0)	135(11.9)
Get school grades information	266(23.5)	309(27.3)	245(21.6)	312(27.6)

Chat or email with friends	399(35.2)	277(24.5)	168(14.8)	288(25.4)
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To what extent do you agree with this statement?

	Strongly Agree	Agree	Disagree	Strongly Disagree
I don't know how to use K-Net.	190(16.8)	217(19.2)	186(16.4)	539(47.6)
K-Net is too hard to use.	169(14.9)	223(19.7)	206(18.2)	534(47.2)
I do not have a computer at home that I can use.	205(18.1)	96(8.5)	68(6.0)	763(67.4)
My parents do not want me to use K-Net.	159(14.0)	138(12.2)	101(8.9)	734(64.8)
I do not have Internet access at home.	198(17.5)	99(8.7)	69(6.1)	766(67.7)
We do not have time during school hours to use K-Net.	236(20.8)	289(25.5)	282(24.9)	325(28.7)

Quantitative Findings

The first set of analyses conducted included correlations between parent and student usage and teacher and student usage. This analysis was based on the secondary data provided by the developer of the LMS. Usage was a calculated variable that included the number of uploaded documents, average student hits, and average teacher hits. The correlation between average student hits and parent usage was $r = 0.51$, $p < 0.001$. The correlation between the student and teacher usage was $r = 0.48$, $p < 0.01$. The correlation between parent and teacher usage was low, only $r = 0.06$.

Table 3

Variance Explained by Each of the Factors

Component	Initial Eigen Values			Extraction Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	5.192	24.723	24.723	5.192	24.723	24.723
2	3.034	14.446	39.169	3.034	14.446	39.169
3	1.973	9.397	48.566	1.973	9.397	48.566
4	1.342	6.393	54.959	1.342	6.393	54.959
5	1.130	5.381	60.340	1.130	5.381	60.340

The next analysis was confirmatory factor analysis. This included all of the items of the questionnaire. We expected a two-factor structure. The minimum factor-loading criterion was set to 0.45 (Hair, Black, Babib, Anderson, & Tatham, 2006); items loading below 0.40 were not used in the interpretation. The first two factors accounted for 39.17% of the total variance (see Table 3). The items were roughly clustered into the two conceptualized categories, knowledge of ICT/LMS (factor 1) and perceived barriers (factor 2). Factor 3 included sub-knowledge items concerning student knowledge of the LMS. Factor 4 included the items “communicated through email” and “participate in chats on the Internet” (See Table 4). Factor 5 included the ICT knowledge item “use of sound in the PowerPoint presentation.”

To determine the reliabilities of the factors and to assess their internal consistency, we used Cronbach’s alpha. The three scales that appeared in the factor structures had a meritorious internal consistency (Cronbach’s alpha \geq 0.8). For the items in the first factor (items 1 to 14, namely, knowledge of ICT/LMS), a Cronbach’s alpha of 0.85 was obtained. For the second factor (items 16–21), a Cronbach’s alpha of 0.81 was obtained. The scale was scored by adding the rating of all of the items and dividing that total by the number of items. The items of the two scales proved to be appropriate and applicable to a sample of Qatari students.

Regression Analysis

A linear regression analysis was performed using the mean score for the student knowledge scale. The mean score for the perceived barriers was regressed on student LMS usage as the dependent variable. The regression model indicated that the overall relationship between the independent variables and student usage was nearly significant at $F(2,7) = 4.25$, $p < 0.06$, with an R -squared of 0.55. This high variance in the model suggests that there was a strong inverse relation between the ICT/LMS knowledge on usage. Hence, we broke down the knowledge of ICT/LMS into two variables, knowledge of ICT and knowledge of LMS, and ran two separate regressions.

Table 4

Principal Component Analysis

	Components				
	1	2	3	4	5
Use the computer for class work or homework	.534	-.151	.173	-.394	.303
Use the Internet for homework	.567	-.167	.162	-.351	.397
Communicate through email	.458	-.237	.287	.551	.149
Participate in chats on the Internet	.540	-.166	.285	.494	.141
Find information on the Internet	.561	-.268	.159	-.183	.334
Upload files to the Internet	.521	-.197	.301	.327	.097
Make a PowerPoint presentation	.592	-.259	.329	-.231	-.367
Use graphics in a PowerPoint presentation	.575	-.297	.376	-.244	-.375
Use sound in a PowerPoint presentation	.632	-.136	.210	-.125	-.461
Group projects	.628	.067	-.453	-.109	.038
Research	.603	-.029	-.544	-.079	.143
Homework	.597	-.025	-.515	-.114	.149
Communicate with your teacher	.544	.170	-.210	.112	-.285
Get school grades information	.562	.036	-.413	.131	-.164
Chat or email with friends	.585	-.050	-.311	.414	-.028
I don't know how to use K-Net	.221	.612	.351	.001	.113
I do not have a computer at home that I can use	.282	.720	.018	-.013	-.095
My parents do not want me to use K-Net	.273	.684	.041	.020	-.025
I do not have Internet access at home	.251	.721	-.026	-.034	-.116
We do not have time during school hours to use K-Net	.189	.551	.145	-.101	.131
K-Net is too hard to use	.214	.626	.345	.055	.155

In a second and third regression (see Table 5), we used a measure that separately addressed the ICT and the LMS knowledge items respectively. LMS knowledge appeared as the third factor in the item reduction analysis. The *R*-squared for the second regression was 0.56. Although the variance was meritorious, the regression model showed that the overall relationship between the independent variables and student usage was insignificant at $F(2,7) = 4.3, p > 0.05$. The knowledge of ICT was significantly and inversely related ($p < 0.05$) to student usage. Barriers were entered second in the regression and had a non-significant relation (see Table 5).

In the third and final quantitative analysis we carried out a linear regression. The R -squared was 0.17, and the model was not significant at $F(2,7) = 0.72, p > 0.05$. There was no significant relation between LMS knowledge and usage and barriers and usage.

Table 5

Regression Using Barriers and LMS and ICT Dimensions Separately in Two Regression Models

Model	Unstandardized coefficients		Standardized coefficients		
	<i>B</i>	Std. Error	Beta	<i>t</i>	Sig.
(Constant)	132.36	69.353		1.908	.098
ICT/LMS Knowledge	-73.144	25.156	-.830	-2.908	.023
Barriers	44.079	28.801	0.437	1.530	.170
(Constant)	157.82	74.815		2.109	.073
ICT Knowledge	-70.234	23.936	-.787	-2.934	.022
Barriers	32.491	27.061	.322	1.201	.269
(Constant)	26.855	74.575		.360	.729
LMS Knowledge	-22.572	19.005	-.440	-1.188	.274
Barriers	22.292	37.400	.221	.596	.570

Qualitative Analysis Results

The analysis of qualitative data shows that students' thoughts about and attitudes toward the use of LMS were not particularly positive. Some of them reported that while the tool could be useful to establish connections between teachers, learners, and administrators, there were technical challenges that limited students' use of some of the features. Several students stated that the LMS portal had few features to make it more attractive or useful than other Web sites. A statement by a student illustrates this point: "LMS has no peculiar aspect that pushes our teachers to use it." In addition, some respondents were not convinced of the necessity of the tool.

When asked whether they used the LMS, many students answered that they did not use it often. One student explained that this was due to the fact that

most teachers never asked or required us to use it, since students were not rewarded for its use—many students may feel it is a resource which they could get through

other means—some teachers put resources [there], but nothing I needed.

The fact that students did not use the LMS does not seem to be due to a lack of knowledge of how to use it. Most students stated that they had the skills needed to effectively use the LMS.

However, many respondents stressed that they were more interested in using technology for entertainment (games) and communication between peers than for educational purposes. In fact, students who reported using the LMS specified that they used the discussion corner more often than any other feature. One of the students indicated that “the good thing about the LMS is that you can find your friends [that is, classmates] and you can communicate with them.” One possible explanation for low student use of the LMS is the lack of teacher encouragement to use it. Students stated that the use of the LMS tended to be limited to the IT class, which may indicate that teachers do not take advantage of its many features.

With regard to the challenges they faced using the LMS, students expressed frustration and negative computing experiences. Nearly every student user had, at one time or another, experienced frustration caused by a very slow computer, the LMS crashing, or the loss of important work. One issue that was clear throughout the data collected was the concern and frustration with technical problems. The dominant issue was the speed of the server. The LMS is linked to the government’s educational server system, and all the students expressed concern that the system was slow. In addition, the system automatically logs out a user if the computer is idle for more than 20 minutes. Students described becoming frustrated waiting for the LMS to execute a command, only to have the system automatically log them out before it could do so.

Another challenge faced by students was parents’ attitudes toward the LMS and their skill in using it. Students stated that some parents did not allow their children to use the Internet because they did not trust its content and because they had a poor overall understanding of parental controls on web browsers. In addition, most students reported that their parents rarely checked their work on the LMS because they did not know how to, or they felt it was too challenging for them to learn. In support of the qualitative findings, there was a strong correlation between parent and student usage in the secondary data.

Discussion

This study examined student usage of the LMS in Qatar. The LMS has been introduced to 37 independent schools in the country. The correlation analysis on usage, obtained from secondary data of the 37 schools, indicated that there was a strong correlation between parent and student usage. There was also a strong correlation between teacher and student usage but a weak correlation between teacher and parent usage. According to some students, the teachers did not require the students to use the system. However, teachers at

a recent workshop reported a positive sense of LMS usage and stated that there were excellent champion teachers (school-designated teachers who have used the K-Net system extensively and have been honored by ictQATAR as K-Net proficient) in specific independent schools who had served as role models and mentors. One school boasted about a champion teacher who recently won a new laptop in a LMS (K-Net) competition. They reported that there were several successes worth mentioning. One teacher stated that in one of the schools, students produced a school magazine, interviewed the principal and their favorite teachers, and then uploaded the magazine onto the LMS. Another teacher explained that students in one school reported active use of the LMS (K-Net), where the teachers required students to use it twice a week during the IT session. Students used the discussion corner to answer teacher-posted questions and to respond to other students' comments or postings. They participated in school and class competitions and games through K-Net, and winners were given an award during a school ceremony to encourage other students to use the LMS. Students also uploaded information and pictures of projects they had prepared for classes. Another interesting use of K-Net was the "stories written by students" on "Students' Voice," a section of K-Net. Students copied stories they had written and uploaded them to the LMS to share them with the school. Students then voted for the best story, and a prize was given to the author, whose name was announced on the LMS (K-Net). Students also recorded themselves singing, reading a poem, or telling a story and uploaded these videos to the LMS (K-Net). The last use mentioned was part of a school-wide competition to find "K-Net Stars" (i.e., those students who used K-Net most) and reward them.

While these reflections were made by teachers after the study period, they also indicated that students not required by their teachers to use the system were less likely to use it. However, when teachers built activities in and around the LMS with a number of benefits and rewards, the students were motivated to use the LMS. In addition, teachers noted that parents did not encourage their children to use the Internet, as indicated by the qualitative interviews. Students expressed concern that their parents were not actively participating in the LMS. Looker and Thiessen (2003) made the same observations in regard to use. Children whose parents were not engaged in ICT, specifically the aspects that concerned their children's schoolwork, were less likely to use the ICT system than students whose parents were more involved. Qualitative data indicated that some parents did not allow their children to use the Internet for fear that their children would be corrupted. Qatar is a conservative Muslim society with many restrictions on the media and Internet access (Romanowski & Nasser, 2010), and thus students are more likely to develop ICT skills and knowledge if they receive encouragement from their parents (Vekiri & Chronaki, 2008; Vekiri, 2010).

There appear to be no incentives to use the LMS in the current school system, with the exception of some champion schools. School policy should hence develop a system of rewards or obligations to motivate the students to use the LMS and possibly provide refresher courses for teachers to help them understand the system's features. It is well established that teachers who set achievement expectations in class are as likely as parents to influence students, and their reluctance to use the system might impact student adaptation and serve as a barrier to full usage of the LMS (Jones & Dindia, 2004). Currently, students may see

that teachers do not require them to use it, and parents will not follow through because of their fears of what is on the Internet. Teachers are already dealing with a tremendous workload as a result of recent Qatari reforms and may not have time to learn about the LMS or push students to use it (Nasser & Romanowski, in press). On top of all this, the school system does not currently invest much money in ICT, nor does it integrate it into the curriculum (Bauer & Kenton, 2005).

The findings of this study suggest that the items on the scales were standard items used in studies to assess knowledge and barriers. The factor analysis results demonstrated two scales, perceived barriers and knowledge of ICT/LMS. The sub-factor of LMS knowledge was also found.

The regression analysis findings demonstrated that knowledge of ICT/LMS was significantly related to usage. When separating knowledge of ICT and knowledge of LMS, knowledge of ICT was the main variable that significantly predicted usage. This was an inverse relationship, that is higher levels of knowledge were associated with less use of the LMS in schools. School children in California and Israel reported that computer knowledge was associated with playing computer or interactive games rather than problem-solving (Baek & Freehling, 2007; Nachmias, Mioduser & Shemla, 2001). Simply stated, those with basic ICT knowledge are less likely to use the LMS. This implies that it may be beneficial to encourage LMS usage in the early grades to allow greater integration of the technology in the classroom. These systems could also easily adopt games for learning for the young school-children (Morgan & Kennewell, 2005).

Concomitant with these findings are those from France, which revealed that the level of ICT knowledge (lower than expected) produced acceptable results on very basic skills, and that secondary students experienced difficulties on tasks that required deeper knowledge (Tort, Blondel, & Bruillard, 2008). Considering usage among students, Bernstein (1997) highlighted that “computing is more than a set of skills, it is a culture.” The acceptance of Internet culture increases access to various forms of ICT knowledge, and this is one aspect of readiness. The use of Facebook or the LMS forces users to learn new concepts and jargon that may be difficult to absorb (such as old words with new meanings, like *icons* and *windows*, and new words, *taskbar*). Those who have already mastered the language (concepts) may not consider the LMS in Qatar to be very entertaining and thus are less likely to use it. The skills needed to utilize the LMS are beyond simple word processing skills and may require new teachers to grasp computer language and culture that some of those working in the school system could resist in light of the current national reform sweeping all Qatari schools. This reflects a low e-maturity level in school staff and possibly an asymmetry between student knowledge and the ICT knowledge being integrated and used in the traditional classroom. Students may be unchallenged by the ICT/LMS usage and, therefore, use their preferred infotainment applications. Teachers could use this aspect of students’ tastes to develop an interest in educational technologies.

It can easily be argued that the findings of this study are not entirely positive. However, there is sufficient evidence to believe that the LMS should be further developed within

schools in Qatar. Anecdotal evidence from teachers (see above) suggests that the majority of them welcome the LMS. They believe that there is room for improvement, indicating the need for a system of rewards and incentives to encourage its successful implementation. Furthermore, most of the teachers believe that they will use it more in the future. The study was likely conducted too early in the LMS implementation (only one year after its introduction) to obtain a fully accurate picture. It is also apparent that the basic self-rated ICT knowledge among students is negatively related to LMS usage. Teachers could easily utilize the skills of students with a high level of ICT knowledge to create incentives and motivators for them to use the LMS. Perhaps it is too early for its wide implementation in all schools. As of 2010, the LMS (K-Net) was given to the Supreme Education Council (SEC), a permanent body representing the end users of the education system (such as employers and higher education institutions) and responsible for setting national education policy (Brewer, Augustine, Zellman, Ryan, Goldman, Stasz, & Constant, 2007).

The SEC is currently calling for tenders to upgrade the K-Net system applications as well as for a new company to train teachers, students, and parents. The results of the current study could aid teachers in developing programs for students with existing knowledge of ICT. A constructivist approach to LMS engagement is suitable for encouraging students and furthering the use of such systems to promote learning (Richardson, 2004).

There are a number of limitations that the study did not address. Several external factors were not taken into account, including curriculum issues, language barriers, general structural changes, and the work burden of teachers at schools in Qatar (Nasser & Romanowski, in press). All of these hinder the full usage of the LMS. We argue that for the LMS to succeed, policy must be established with carefully planned directives, schools must call for greater teacher accountability and integration of the national Qatar ICT standards, and a system of teacher and student promotions must be implemented. Further, it must be recognized that students might be less motivated to use these technologies to engage in academic work when other traditional means are as viable to do so. It is recommended that a further follow-up study should be conducted to examine usage among teachers, students, and parents two or three years down the road. Lastly, as various approaches might be successful in different contexts, we suggest that the LMS should be implemented in schools in a customized way to find out what works and what does not.

In closing, due to the rapid technological changes taking place in society, many students might consider the LMS to be boring and “backward” (Anderson & Blackwell, 2004). Future studies suggest that mobile devices, such as tablets, personal digital assistants (PDAs), and smart phones, and the use of different modes of communication such as SMS messaging, are the way of the future. These new technologies and programs require ongoing staff training. The LMS might need to adapt to catch up to popular technology to become more usable for future students.

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Quality Assurance in Asian Distance Education: Diverse Approaches and Common Culture



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Abstract

With the phenomenal expansion of distance education in Asia during the past three decades, there has been growing public demand for quality and accountability in distance education. This study investigates the national quality assurance systems for distance education at the higher education level in Asia with the aim of contributing to a better understanding of the current level of development of quality assurance in Asian distance education and to offer potential directions for policy makers when developing and elaborating quality assurance systems for distance education. The analysis of the existing quality assurance frameworks in the 11 countries/territories selected reveals that the level of quality assurance policy integration in the overall national quality assurance in higher education policy framework varies considerably. The purpose of quality assurance, policy frameworks, methods, and instruments in place are generally tailored to each country's particular circumstances. There are, however, obvious commonalities that underpin these different quality assurance efforts.

Keywords: Accreditation; distance education; e-learning; higher education; quality assurance

Introduction

Daniel (2003) suggests that there is ample evidence of distance education (DE) in Asia making great strides with regard to access, equity, and cost-benefit. What is uncertain, however, is whether DE in Asia is providing quality education.

Over the last few decades, there has been a substantial growth in DE in Asia. There are now at least 10 mega-universities, over 70 open universities, and a growing number of conventional institutions offering DE, as well as a rapidly growing number of private and/

or for-profit DE providers operating in Asia (Latchem & Jung, 2009). With the phenomenal expansion of DE and an increasing dependency on DE to provide education, especially higher and further education, there has been growing public concern over the quality of DE delivered.

The meaning of *quality* in DE, in particular, has attracted debate. As suggested by Perraton (2000), the goal of DE for some countries (or providers) is to achieve a level of quality on par with that of face-to-face education. However, Stella and Gnanam (2004) have suggested that DE is so distinctive that the aims and methods of face-to-face education cannot be applied in assessing its quality. Furthermore, as Koul (2006) has commented, DE should be judged by the standards of face-to-face education while factoring in some distinctive features of DE, such as open entry, flexible operations, and technology-based course delivery.

In addition, quality in DE has presented different meanings for governmental policy makers, institutional administrators, teaching staff, and students. Governments may be more interested in efficiency, cost-effectiveness, and public accountability (Koul, 2006), whereas DE providers may be more interested in the quality of their management, staffing, courses, and graduation rates (Hope, 1999). Teachers may be more concerned with the quality of the learning processes and outcomes (Jung, 2011), while students may be more preoccupied with the costs, flexibility, and interactions in their learning (Cashion & Palmieri, 2002; Ehlers, 2004). Moreover, societal and cultural environments affect quality assurance (QA) policies and practices, as indicated in Jung's (2010) ecological model of QA in DE. QA depends upon reconciling all of these different perspectives, considering societal and cultural variations, and reaching agreement on the quality criteria and standards by which to judge the quality of input, process, and output of DE.

Various national, regional, and international initiatives have been undertaken with regard to QA in DE, including e-learning. Examples of national initiatives include the UK Quality Assurance Agency's *Guidelines on the Quality Assurance of Distance Learning* (see <http://www.qaa.ac.uk/academicinfrastructure/codeofpractice/distancelearning/contents.asp>), the Norwegian Association for Distance Education's *Quality Standards for Distance Education* (see <http://nettskolen.nki.no/forskning/DISTUMQualityAssurance.pdf>), the Australasian Council on Open, Distance and E-Learning's benchmarks for DE and e-learning (see http://acode.edu.au/resources/ACODE_benchmarks.pdf), and the National Association of Distance and Open Education Organizations of South Africa's quality criteria for designing and delivering distance education. To mention a few examples of regional and international initiatives, the African Union Commission developed the African Higher Education (including DE) Quality Rating Mechanism (see <http://www.africa-union.org/root/UA/Conferences/2007/aout/HRST/06-10aout/AfricanHEQualityRatingMechanism-E.doc>), the European Association of Distance Teaching Universities produced the *Quality Manual for E-learning in Higher Education* (see <http://www.eadtu.nl/e-xcellenceQS/files/members/E-xcellenceManualGrey/index.html>), the Asian Association of Open Universities offered the *AAOU Quality Assurance Statements of Best Practice* (see http://www.aaou.net/index.php?option=com_content&view=category&layout=blog&id=29&Itemid=30), and the International Council for Open and Distance

Education launched a pilot project (see <http://www.icde.org/?module=Articles;action=Article.publicShow;ID=1765>) to identify regulatory frameworks for distance and online education in different regions, to investigate the best practices, and to examine the rules and regulations hindering distance and online education development.

In Asia, several countries have recognized the need for well-defined QA policy frameworks for DE to assure that quality education is delivered to both students and the public, to safeguard against unscrupulous practices, and to initiate development of QA systems, specifically for DE. This study investigates national QA systems for DE at the higher education level in Asia. Its primary objective is to develop a better understanding of the current development of QA in Asian DE and to offer policy makers directions for developing and elaborating QA systems for DE in their own jurisdictions. DE in this study refers to various forms of technology/media-supported education, such as e-learning.

The study was carried out between January and December 2010 and employed three data collection steps: (a) 11 cases (10 countries and one territory) from East, South, and South-east Asia were carefully chosen to include those with relatively well-established QA systems, those just introducing QA systems, and others still in the process of developing QA concepts in DE; (b) formal documents published by QA agencies (research institutes and governments in the selected countries/territories) and other references were analyzed to delineate DE development, QA policies, procedures, standards, and criteria for higher education in general and DE specifically; and (c) face-to-face, email, or telephone interviews with local experts working in the QA agencies and DE institutions were conducted to verify the data obtained. No quantitative data related to QA policy development and implementation (e.g., the number of accredited/assessed DE institutions, the number of QA criteria, and standards) were collected because they were not considered necessary for the purposes of this study. This paper outlines the development of DE in each of the 11 cases, discusses differences and similarities, and concludes with a set of recommendations for the further development of QA for Asian DE.

Development of Distance Education

The following section outlines the development of DE and national QA systems in China, Hong Kong SAR (China) (Hong Kong hereafter), India, Indonesia, Japan, South Korea (Korea hereafter), Malaysia, Mongolia, Philippines, Singapore, and Sri Lanka to provide a basis for subsequent analyses.

China

The Open University System of China (OUSC) (combining former China Central Radio and TV University, which was established in 1979, with other radio and TV universities across the country) was the country's sole DE provider for 20 years. Then, between 1998 and 2003, the Ministry of Education (MoE) licensed 68 online colleges operating from within conventional universities such as Tsinghua University, Peking University, Beijing Normal University, and other institutions to become online providers. By 2008, the number of ac-

tive distance students in China was 3,560,000, or 12% of all students in the higher education sector. Of these, some 2,250,000 were studying through the OUSC, while 1,310,000 were in the online colleges. However, facing growing public concern over the quality of the courses and programmes offered, the MoE in 2003 ceased granting approval for new online colleges and introduced a QA system that required both the OUSC and online colleges to comply with the guidelines and documents provided by the MoE and imposed nationally standardized examinations upon them. The institutions were also required to follow the Annual Reporting and Censorship procedure, which involves annual internal reviews and external audits by the Distance and Continuing Education Office in affiliation with the Department of Higher Education of the MoE.

Hong Kong

DE arrived in Hong Kong with the establishment of the Open Learning Institute of Hong Kong (OLIHK) in 1989. OLIHK was granted self-accrediting status in 1996 by the Hong Kong Council for Academic Accreditation (HKCAA). In 1997, the OLIHK was conferred the title of *university* by the government and renamed the Open University of Hong Kong (OUHK). As of 2010, over 13,000 students were enrolled in the university's DE programmes. As a university with self-accrediting status, programmes offered by OUHK no longer need to be subjected to external accreditation. However, the institution is required to undertake periodic institutional audits. Other DE/online education institutions/programmes in Hong Kong include the Cyber University of the Hong Kong Polytechnic University, the Hong Kong Virtual University consortium, and the School for Professional and Continuing Education of the University of Hong Kong. In 2007, with the enactment of the *Accreditation of Academic and Vocational Qualifications Ordinance* (see [http://www.legislation.gov.hk/blis_pdf.nsf/6799165D2FEE3FA94825755E0033E532/08A299C8E01C2F21482575EF001FFE6F/\\$FILE/CAP_592_e_b5.pdf](http://www.legislation.gov.hk/blis_pdf.nsf/6799165D2FEE3FA94825755E0033E532/08A299C8E01C2F21482575EF001FFE6F/$FILE/CAP_592_e_b5.pdf)) the HKCAA was renamed the Hong Kong Council for Academic and Vocational Qualifications (HKCAAVQ).

India

The Indira Gandhi National Open University (IGNOU) was established in 1985 and currently serves over 3.5 million students. Over the last two decades, 13 more state open universities and over 50 other DE institutions catering to 25% of all enrolments in higher education have emerged. The Distance Education Council (DEC) was established within IGNOU in 1991 to assess and provide oversight on the quality of DE in India. The *DEC Handbook on Assessment and Accreditation of Open & Distance Learning Institutions* (see http://www.dec.ac.in/Revised_Copy_of_HANDBOOK_on_A_&_A-version1.doc) provides guidelines and criteria for assessment and accreditation in DE. To qualify for employment in the government sector, holders of DE-based degrees and certificates graduate from institutions that are approved by the DEC.

Indonesia

Since the mid-1950s, Indonesia has used DE to train teachers, but it was not until 1984, when Universitas Terbuka (UT) was established, that DE became widely accepted and recognized within the country. Although it has been permissible for conventional universities

to offer DE courses and programs since 2001, UT remains the only higher education institution that is entirely employing an open and distance education system in Indonesia. UT's total student body was over 650,000 as of 2010. As a public university, UT must adhere to all of the quality standards and regulations applicable to higher education institutions in Indonesia, including the submission of semester-based self-assessment reports to the Ministry of National Education. UT has been accredited by the independent National Accreditation Board of Higher Education (BAN-PT). In addition, UT has voluntarily sought accreditation from other international organizations, including the International Council for Open and Distance Education (ICDE) and the International Organisation for Standardisation/ISO for ISO 9001:2000/2008.

Japan

The Open University of Japan (OUJ) (formerly the University of the Air) first offered bachelors' programmes in the greater Tokyo area through terrestrial TV and radio and correspondence in 1985. In 1998, it went nationwide, using satellite digital broadcasts and a network of study centres. It served almost 100,000 students in 2010. Since 2001, OUJ has also provided graduate programmes, but e-learning has not yet been mainstreamed into OUJ's system. Besides OUJ, 42 conventional universities, two cyber universities, and several graduate schools also offer DE programmes. Since 2004, all higher education institutions have needed to be reviewed and accredited every seven years by one of three QA agencies approved by the Ministry of Education, Culture, Sports, Science and Technology. These are the National Institute of Academic Degrees and University Evaluation (NIAD-UE), the Japanese University Accreditation Association (JUAA), and the Japanese Institute for Higher Education Evaluation (JIHEE). Despite this, no specific QA or accreditation system has been established for DE institutions or their programmes.

Korea

The Korea National Open University (KNOU), established in 1972, was the sole DE provider in Korea until the Ministry of Education, Science and Technology (MEST) legislated for the creation of cyber universities in 2001. As of 2010, there were 18 cyber colleges and universities offering bachelors' and masters' degrees in various majors. KNOU has over 170,000 students, while the cyber universities served over 30,000 students in 2010. All universities offering four-year programmes, including KNOU, must conduct self-evaluations at least once every two years and submit their findings to the Korean Council for University Education (KCUE)—the only government-recognized agency allowed to accredit four-year universities as of 2011. In the case of cyber universities, the Korea Education and Research Information Service (KERIS) monitors their quality programmes based on guidelines established in the *Cyber University Evaluation Handbook*.

Malaysia

DE programmes have been offered by DE units located within conventional universities such as the University of Science, Malaysia since the 1970s. During the past decade, three dedicated distance universities have been established in Malaysia: Open University Malaysia, established in 2000, Wawasan Open University in 2006, and Asian e-University

in 2008. Together they served approximately 90,000 distance learners in 2010. The Malaysian Qualifications Agency (MQA) was established in 2007 to monitor the QA practices of all higher education institutions—including distance universities—and to accredit their programmes. Until 2010, programmes offered by the DE universities were accredited using guidelines, criteria, and standards developed for conventional universities. In Malaysia, both conventional and DE programmes must first obtain provisional accreditation from the MQA before approval can be given by the Ministry of Higher Education for student recruitment. Programmes with a provisional accreditation status are required to undertake the full accreditation audit in the semester prior to the graduation of their first graduates. Universities that have successfully completed several cycles of programme accreditation may be invited by the Minister of Higher Education to undertake an institutional audit, the successful completion of which can lead to the awarding of self-accrediting status. Institutions with self-accrediting status are no longer required to undertake programme accreditation.

Mongolia

Mongolia does not have any dedicated DE institutions. However, some DE programmes are offered by a number of institutions, including four public universities (Mongolian University of Science and Technology [MUST], National University of Mongolia, University of Health Science, and Mongolian Educational University) and a few private institutions. Among these universities and institutions, MUST has been the most active in developing and implementing e-learning programmes. Between 2007 and 2010, MUST offered 16 masters' degree programmes online as well as integrated ICT in the delivery of its undergraduate courses. The Mongolian National Council for Education Accreditation (MNCEA) was established as a government initiative in 1998 to evaluate and accredit universities and colleges in an attempt to address public concerns over the quality of higher education. In 2002, it started accrediting vocational and technical institutions as well.

Philippines

As an archipelago of 7,100 islands, the Philippines would seem to be an ideal place for the development of DE. However, only 17 higher education institutions offer DE programmes. Among the existing standalone DE providers are the University of the Philippines Open University (UPOU), which is part of the University of the Philippines System, CAP College, the Asian Institute for Distance Education, and the Southeast Asia Interdisciplinary Development Institute. The rest are conventional universities offering a few of their programmes by way of DE. Most of the DE provision is at the graduate level, which would perhaps account for the low DE student enrolments nationwide. As of 2010, UPOU, the most comprehensive DE institution in the country, offered only two undergraduate programmes and had a total enrolment of about 2,500 students per semester. Public institutions are monitored and assessed by the Commission on Higher Education (CHED) and undergo voluntary accreditation by the Accrediting Association of Chartered Colleges and Universities of the Philippines. Private institutions are required by CHED to be certified by the Federation of Accrediting Agencies of the Philippines, which includes the Philippine Accrediting Association of Schools, Colleges and Universities and the Philippine Association of Colleges and Universities' Commission on Accreditation.

Singapore

The government of Singapore currently does not accredit programmes or higher education institutions. However, the Higher Education Quality Assurance Section of the MoE has been auditing universities that offer four-year degree programmes under the Quality Assurance Framework for Universities (QAFU) since 2004. The main DE provider in Singapore, UniSIM, uses a blended approach for delivering education wherein e-learning is used to supplement face-to-face classes. Its emergence can be traced back to 1992, when the MoE appointed the Singapore Institute of Management (SIM) to collaborate with the UK Open University to offer the Open University Degree Programme (OUDP). In 2002, OUDP was granted accreditation status by the UK Open University and renamed SIM Open University Centre (SIM-OUC). In 2005, SIM-OUC was granted full university status and renamed UniSIM. As of 2010, UniSIM served over 11,000 students and fell under the MoE's *Quality Assurance Framework for Universities* (see <http://www.moe.gov.sg/media/press/files/2003/05/report.pdf>) in terms of its institutional QA audit.

Sri Lanka

Since its establishment in 1978, the Open University Sri Lanka (OUSL) has been the only DE provider. In 2010, it had an enrolment of around 25,000 students. In recent years, with the implementation of the Distance Education Modernization Project (DEMP) of the Ministry of Higher Education, which is funded by the Asian Development Bank, several universities have developed DE programmes and DE materials. Both conventional and DE universities are accredited by the Quality Assurance and Accreditation Council (QAAC) of the Ministry of Higher Education. QAAC was established in 2003 to ensure quality, continuous development and efficient performance of Sri Lankan higher education institutions. Working jointly with the Commonwealth of Learning, the ministry produced the *Quality Assurance Toolkit for Distance Higher Education Institutions and Programmes* (see http://www.col.org/PublicationDocuments/pub_HE_QA_Toolkit_web.pdf) in 2009.

Quality Assurance Systems: Differences and Similarities

Asia currently has more open and distance teaching universities and more distance learners than any other region in the world (Latchem & Jung, 2009). The ever-expanding demand and increasing availability, sophistication, and affordability of technology is encouraging governments to urge more institutions to adopt DE, seek new markets, and offer their courses online. However, the biggest challenge facing all of these institutions is how to assure and improve quality, while at the same time widening access, reducing costs, and developing the kinds of mechanisms that will best support such efforts (Jung, 2005). This study revealed that diverse QA systems exist in Asia. Nevertheless, common elements are also clearly noticeable. This section discusses the differences and similarities found in various aspects of the QA systems in the 11 cases studied.

Basic Approaches to QA

An analysis of the cases shows that Asian countries have adopted three approaches to QA

in DE.

The first category, as exemplified by Hong Kong, Malaysia, Indonesia, Philippines, Singapore, and Sri Lanka, considers DE as an integral part of higher educational delivery and thus applies the same procedures and criteria to all types of educational provisions. Some show consideration toward the uniqueness of DE during the accreditation or auditing processes.

- Indonesia adjusted its accreditation instrument to accommodate the uniqueness of open and distance higher education programmes (the *Accreditation Instrument for Distance Education Study Programmes*) in evaluating DE programmes but does not have a separate accreditation process for purely DE and online programmes.
- The Philippines specifies DE accreditation criteria in the CHED Memorandum Order No. 27 (see <http://www.ched.gov.ph/chedwww/index.php/eng/Information/CHED-Memorandum-Orders/2007-CHED-Memorandum-Orders>) (Commission on Higher Education, 2005). This stipulated that only graduate-level programs with Level III accreditation could be offered at a distance, with the assumption being that undergraduate students need face-to-face contact with mentors and peers for optimal learning. However, CHED has authorized some institutions, including the University of the Philippines Open University, to offer undergraduate programmes at a distance and officially recognizes them.
- Sri Lanka encourages the use of the *Quality Assurance Toolkit for Distance Higher Education Institutions and Programmes* (see http://www.col.org/PublicationDocuments/pub_HE_QA_Toolkit_web.pdf) in evaluating and improving QA systems and policies.
- Malaysian Qualifications Agency is currently in the process of developing the *Guideline to Good Practices for Open and Distance Learning*, which includes 177 benchmarked and enhanced performance indicators (PIs) across nine QA areas. The same nine areas are also used for the programme accreditation and institutional audit of conventional institutions.
- Hong Kong and Singapore use common guidelines and standards for both conventional and DE institutions.

The second category, covering countries such as China, India, and Korea, acknowledges the distinctive features of DE and thus applies different QA procedures and criteria.

- In China, while conventional higher education is evaluated by the General Higher Education Office, DE/e-learning institutions, including OUSC and online colleges, are managed and evaluated by the Distance and Continuing Education Office within the Department of Higher Education of MoE by applying different QA criteria and procedures from those used in conventional institutions.

- In India, the DEC oversees QA for DE. In 2009, a *New Policy on Distance Learning in Higher Education* (see <http://www.education.nic.in/dl/PolicyDraft-DL.pdf>) was introduced, under which all new DE programmes must not only be approved by the DEC but also accredited by the National Board of Accreditation.
- In Korea, KERIS has managed the evaluation of cyber universities using a QA framework that is different from that used for conventional institutions. In the future, however, KCUE and/or other agencies that acquire the government's recognition as an accreditation agency may be put in charge of the quality auditing and accreditation of DE institutions.

The third category, which covers countries like Japan and Mongolia, has yet to determine its position or is in the process of developing QA procedures and criteria considerate of the distinctive features of DE.

Purposes of QA

Brennan (1999) has suggested seven purposes for QA in higher education: (1) ensuring accountability for public funds, (2) improving the quality of educational provision, (3) stimulating competition within and between institutions, (4) verifying the quality of new institutions, (5) assigning institutional status, (6) underwriting transfer of authority between the state and institutions, and (7) facilitating international comparisons.

In Asian countries, the common rationale behind the adoption of a QA system for DE is to ensure accountability and improve the quality of DE provision, although several other purposes for QA have also been observed.

To ensure public accountability and assign institutional status, accreditation is often adopted in several cases. *Accreditation* is the process of external assessment and peer review that determines whether an institution (or programme) qualifies for a certain status or to be recognized or certified as having met certain requirements. The result of accreditation is that an institution or programme either receives or does not receive accreditation. Accreditation for DE institutions or programmes takes place in Hong Kong, India, Indonesia, Japan, Korea, Malaysia, and the Philippines.

Under the aim of improving the quality of DE provision, academic audits are frequently used. *Academic audits* focus on the processes that an institution has in place to ensure quality. Typically, documents to be submitted include a critical self-analysis report and an external review verifying the self-report via an onsite visit prior to recommendations being made for improvement. A subsequent monitoring process is also put in place. Academic audits ask, "How well are you doing what you say you are doing?" They adopt either performance indicators that are developed and collected at the institutional level or standardized national performance indicators against which institutions are audited. In Asian DE, the regulatory authorities in China, Hong Kong, Japan, Korea, Malaysia, Sri Lanka, and Singapore conduct periodic academic audits. QA also focuses on verifying the quality of new institutions and stimulating competition between DE institutions. This is particularly true

in China, Korea, and Malaysia, where conventional universities are increasingly providing private DE.

To stimulate competition within and between institutions, *performance-based funding* has been adopted in a few cases. Performance-based funding ties public funding to the performance of an institution or a programme. In the case of Indonesia, Sri Lanka, and Korea, the outcomes of accreditation or academic audits are directly or indirectly linked to governments' funding decisions.

To provide valuable information that allows the public and policy makers to make decisions and reflect on the customer-oriented focus of DE provision, several countries have made moves to publicly disclose QA information. *Performance reporting* refers to a QA approach that makes reports on institutional performance available to the public and submits them to government and/or QA authorities. While most Asian countries make the reports public, some countries, such as China, Indonesia, Japan, the Philippines, and Sri Lanka, disclose either the final outcome on the status of accreditation or audits only or limit sharing of the reports to those within institutions and QA authorities.

In the cases of Singapore and Hong Kong, where self-accreditation has been adopted, QA provides the basis for underwriting the transfer of authority between the government and institutions.

Regulatory QA Frameworks

There exist different types of regulatory frameworks for QA in DE.

- In China and Singapore, the government (MoE) directly regulates QA measures for DE institutions or programmes.
- In Hong Kong, India, Korea, Malaysia, and Sri Lanka, a government QA agency regulates QA in DE.
- Some QA bodies (Korea's KERIS, Indonesia's BAN-PT) are governmental initiatives, and others, as in India, are quasi-governmental structures where the QA agency has a close relationship with the government but is administered by autonomous governing structures. In Indonesia, QA in higher education is enforced both through self-evaluation monitored directly by the Ministry of National Education and accreditation by an independent accreditation agency (BAN-PT).
- In the Philippines, both technical panels organized by a government-operated QA agency and membership-based agencies or professional associations are responsible for QA.
- In Japan's case, three non-governmental membership-based agencies with government recognition regulate QA of higher education institutions.

In Asia, the regulatory approaches covering accreditation and/or academic audits for DE

institutions/programmes can be either mandatory or voluntary.

- In Hong Kong, Indonesia, India, Mongolia, and the Philippines, accreditation and/or institutional audits are conducted on a voluntary basis, and the outcomes of QA processes are not directly linked to government funding. However, in the case of India and Mongolia, special development funds or government scholarships are given only to accredited institutions.
- In other countries, such as China, Japan, Korea, Malaysia, and Singapore, accreditation and/or periodic audits are mandatory. In China, online institutions that fail to pass their annual academic audit are not allowed to recruit students the following year. In Korea's case, the outcomes of QA activities are directly linked to financial and administrative support from the government. Japan, Malaysia, and Singapore do not link the QA results to governmental funding decisions, but Malaysia links the outcome to a rating system, as well as to levels of institutional autonomy in the case of public universities.

Table 1 outlines these features of the QA regulatory agencies/units in selected Asian countries/territories.

Table 1

Features of QA Regulatory Accreditation Agencies in 11 Asian Countries/Territories

Country	QA Regulatory Agency/Unit	QA Purposes	Compulsory vs. Voluntary	Published QA Guidelines for DE	Coverage
China	Distance and Continuing Education Office of Higher Education Department of MOE	Institution accreditation and Academic audit; Limited performance reporting	Compulsory, every year	No	All OUSC institutions and 68 online colleges
Hong Kong SAR (China)	Hong Kong Council for Accreditation of Academic and Vocational Qualifications (HKCAAVQ)	Programme accreditation and Academic audit (same as institution review) ; Full performance reporting	Voluntary	No	Both conventional and DE institution/ programmes

India	Distance Education Council (DEC)	Institution accreditation; Full performance reporting	Voluntary	DEC Handbook on Assessment and Accreditation of Open & Distance Learning Institutions	DE institutions only
Indonesia	National Accreditation Board of Higher Education (BAN-PT)	Programme accreditation; Performance-based funding; Limited performance reporting	Voluntary	Accreditation Instrument for Distance Education Study Programmes	Both conventional and DE programmes
Japan	National Institute of Academic Degrees and University Evaluation (NIAD-UE)	Institution accreditation; Academic audit; Limited performance reporting	Compulsory, every 7 years	No	Both conventional and DE institutions
	Japanese University Accreditation Association (JUAA)	Institution accreditation; Academic audit; Limited performance reporting	Compulsory, every 7 years	No	Both conventional and DE institutions
	Japanese Institute for Higher Education Evaluation (JHEE)	Institution accreditation; Academic audit; Limited performance reporting	Compulsory, every 7 years	No	Both conventional and DE institutions
Korea	Korean Council for University Education (KCUE)	Institution accreditation; Academic audit; Performance-based funding; Full performance reporting	Compulsory, every 5 years (Self evaluation: Compulsory, every 2 years)	No	Both conventional 4-year universities and KNOU
	Korea Education and Research Information Service (KERIS)	Institution accreditation; Academic audit; Performance-based funding; Full performance reporting	Compulsory, every 2 years	Cyber University Evaluation Handbook	18 cyber universities

Malaysia	Malaysian Qualifications Agency (MQA)	Programme accreditation; Academic audit; Full performance reporting	Compulsory, every 5 years	Guideline to Good Practices for Open and Distance Learning	Both conventional and DE programmes
Mongolia	Mongolian National Council for Education Accreditation (MNCEA)	Institution Accreditation	Voluntary	No	Conventional institutions only
Philippines	Accrediting Association of Chartered Colleges and Universities of the Philippines (AAC-CUP)	Institution/Programme accreditation; Limited performance reporting	Voluntary (3–5 years depending on the accreditation status)	No	Public institutions/ programmes only
	Philippines Accrediting Association of Schools, Colleges and Universities (PAASCU)	Institution/Programme accreditation; Limited performance reporting	Voluntary (3–5 years depending on the accreditation status)	CHED QA System for DE	Both public and private, conventional and DE institutions/ programmes
Singapore	MOE's Quality Assurance Framework for Universities (QAFU)	Academic audit; Full performance reporting	Compulsory, every 4 years	No	Both conventional and DE institutions/ programmes
Sri Lanka	Quality Assurance and Accreditation Council of the UGC/Ministry of Education (QAAC)	Institution/Programme accreditation; Academic audit; Performance-based funding; Limited performance reporting	Compulsory, every 5 years	Quality Assurance Toolkit for Distance Higher Education Institutions and Programmes	Both conventional and DE institutions/ programmes

QA Methods and Procedures

The QA regulatory systems practiced in the 11 Asian countries/territories generally adopt both internal and external reviews and follow four common procedures.

1. *Review based on pre-determined QA criteria:* A set of QA standards and criteria determined by the government or the QA agency are applied to all institutions or pro-

grammes. In developing the standards and criteria, nationwide consultations with experts are often sought.

2. *Self-assessment (self-study, self-evaluation)*: The institution (or programme) undergoing the accreditation/academic audit process is required to conduct a self-assessment and report on how it meets the predetermined standards or criteria.
3. *External review (peer review)*: A team of external peers constituted by the QA agency analyzes the submitted documents, including the self-assessment report of the institution/programme, and validates the claims made in the report, generally by visiting the institution.
4. *Final decision by the QA/accreditation agency*: Based on the results of the self-assessment and external review, the QA agency makes a final decision.

Some QA agencies (e.g., Japan's NIAD-UE and Mongolia's MNCEA) assist the institutions by providing training on how to prepare a good self-assessment report. Many agencies provide training for external reviewers. In the case of India's DEC, an institution's readiness is assessed before it is put through the formal QA process.

QA Standards and Criteria

The study revealed that in places where there is a QA system for DE, the QA criteria or guidelines for self-assessment and external review are often specified to cover input, process, and output variables in most if not all of the 12 key areas listed below:

1. Vision, mission, values, and/or goals;
2. Assessment and evaluation;
3. Educational resources;
4. Leadership, governance, and administration;
5. Finance;
6. IT infrastructure;
7. Teaching and learning;
8. Curriculum and course development;
9. Student support;
10. Faculty and staff;
11. Internal QA system;

12. Research.

Hong Kong, Indonesia, Japan, Malaysia, the Philippines, Singapore, and Sri Lanka apply the same QA criteria for both conventional and distance institutions/programmes. In Mongolia, these QA criteria are applied only to conventional universities. China, India, and Korea have developed specific QA criteria for DE. Table 2 reveals the following:

- Vision, mission, values and/or goals, assessment and evaluation, educational resources, teaching and learning, curriculum and course development, and student support are included as QA areas in all 11 cases;
- QA areas like leadership, governance and administration, finance, faculty and staff, and research are included in all cases except in China and the Philippines;
- IT infrastructure is an important QA concern for Hong Kong, India, Indonesia, and Korea, whereas other countries do not assess this area aside from generically under learning support;
- Hong Kong, Indonesia, Japan, the Philippines, and Sri Lanka assess whether or not DE institutions operate an internal QA system, while others do not;
- In the case of Sri Lanka, the *Quality Assurance Toolkit for Distance Higher Education Institutions and Programmes* lists performance indicators for distance higher education institutions under ten QA criteria, and those of programmes under six criteria that represent the various dimensions of DE practice; these performance indicators are designed to enable institutions to (a) conduct a self-assessment of the performance of their processes in order to make the adjustments and changes necessary for qualitative improvement, and (b) monitor the processes for continuous learning and ongoing improvement.

Table 2

Key QA Areas for DE in 11 Asian Countries/Territories

QA Areas	Countries/Territories										
	China	Hong Kong SAR (China)	India	Indonesia	Japan	Korea	Malaysia	Mongolia	Philippines	Singapore	Sri Lanka
Vision, Mission, Values & Goals	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Assessment & Evaluation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Educational Resources	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Leadership, Governance, Administration		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Financial Resources		✓	✓	✓	✓	✓	✓	✓		✓	✓
IT Infrastructure		✓	✓	✓		✓					
Teaching & Learning	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Curriculum & Course Development	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Student Support	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Faculty & Staff	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Internal QA System		✓		✓	✓				✓		✓
Research		✓	✓	✓	✓	✓	✓	✓		✓	✓

International Accreditation

Several DE institutions in Asia have obtained accreditations from international agencies. Among the 11 cases in this study, several online education colleges in China and Indonesia's

UT have obtained ISO 9001. A panel from the International Council for Open and Distance Education (ICDE) has also reviewed UT. The purpose of the ICDE quality review is to boost public confidence in the quality of the standards and services provided to students in DE. The quality review does not involve a review of academic standards of courses or qualifications. It assumes that institutions will be operating within the overall national and/or state legislation as well as within the guidelines that are applicable to them at any given time. Thus, the aims of an ICDE review are to satisfy the public interest in knowing that an institution is (a) providing services to students of an acceptable quality and an appropriate standard in the context of national and regional standards, and (b) exercising its legal powers in a proper manner.

Conclusion

The level of QA policy integration in an overall national QA in higher education policy framework varies across the 11 cases examined. The experience of these countries/territories that are at different stages of QA system development shows that the QA purpose, policy framework, methods, and instruments are tailored to each country's particular circumstances, as was argued in the ecological model of QA in DE (Jung, 2010) and supported by a survey conducted by the Asia Pacific Quality Network (APQN, 2008). But at the same time, it reveals that there are commonalities that connect the different QA efforts in the cases examined, including the following:

- working toward promoting a culture of quality within QA agencies and DE providers;
- positioning QA in the pursuit of self-improvement and public accountability of DE institutions;
- considering distinctive features of DE in QA frameworks or during evaluation processes;
- linking QA results to direct or indirect funding, levels of autonomy, or other supports;
- adopting both internal and external assessments; and
- making QA results public.

Overall, QA in DE is still at an early stage of development compared with QA in conventional higher education. QA in DE is still a relatively new concept in some countries/territories, and the different QA approaches described above reflect the differences in cultures, expectations, and stages of development. Each of these approaches has its own particular strengths and weaknesses, so it would be invidious to prescribe any single approach. However, in light of these findings, it is suggested that the following principles should underpin national QA policy directions and that without them there will be a considerable waste of resources and human potential in Asian DE.

- All nations should see QA in DE as an integral part of broader national, regional, and international QA frameworks, as argued by Jung and Latchem (2007), Saito (2009), and Stella and Gnanam (2004). In a cross-border DE context, learners can be distributed anywhere and education can be delivered to them wherever they are. In the not-too-distant future, learners may take some part of their course from one university, and others from another university, and yet others from a third university within their own nation or beyond. To protect learners from the risks of low-quality programmes and education of limited national and international validity, QA policies in the DE of a nation should be linked to the broader national, regional, and international QA frameworks.
- Concerted efforts are needed from governments, national and regional QA bodies, and institutions regarding cross-border accreditation and QA in Asian DE. Charmonman (2008) observed that while all ASEAN countries are promoting e-learning, there are problems with cross-accreditation that need to be resolved for the sake of educational development and the free flow of skilled manpower. He suggests that all ASEAN governments should either grant recognition to all online degree programmes accredited by another ASEAN government or establish a commission to do this.
- With the convergence of conventional and distance educational methods, there should be no distinctions between QA in DE and conventional higher education or between e-learning and face-to-face teaching. However, having said that, specific QA guidelines, criteria, or methods are needed for the various modes of delivery practiced in India, Indonesia, Korea, Malaysia, and Sri Lanka.
- The existence of a national QA framework would enable DE institutions to make QA an integral part of their institutional missions with respect to teaching and research and to promote a culture of quality in their institutions. Koul (2006) suggests the necessity of a “culture of quality” that is shared willingly by all staff members who both draw from and nurture it, links internal and external accountability, builds capacities in QA, and involves open and transparent management and communication. Such a culture entails questioning the status quo, admitting failures or underperformance, acknowledging the changes needed, and implementing these changes. Such behavioral change may well require a considerable paradigm shift in some of Asia’s more hierarchical and bureaucratic institutions that currently only pay lip service to the idea of QA, but it is essential if DE is to deliver on its promises and be held in high regard (Latchem & Jung, 2009).
- Understanding the relative and value-laden nature of QA (Dondi, Moretti, & Nascimbeni, 2006), Asian governments, DE providers, and assessors should make an effort to understand distance learners’ concerns and integrate their views when developing national and institutional QA policies because the success of DE typically relies to a greater extent on learners’ motivation and engagement. This learner-centred QA framework has been studied and promoted in several different contexts, such as in Europe (Ehlers, 2004) and Asia (Jung, 2011).

- As COL (2009) and Shale and Gomes (1998) argue, quality key performance indicators (Q-KPIs) will help DE institutions monitor their performance against institutional objectives and key principles of their plan. DE institutions can use these Q-KPIs in self-assessment for continuous qualitative improvement. In particular, new DE institutions will benefit from using the indicators during formative evaluation and thus to correct and enhance their initial actions.

These policy directions should be further elaborated based on strong research evidence. Future research is needed to investigate culturally considerate QA guidelines and key performance indicators, understand learners' perceptions of DE quality, look into different QA issues in various forms of DE, examine the feasibility of a regional or cross-border QA mechanism for Asian DE, and explore the possibilities of linking with other regions' QA frameworks.

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Literacy at a Distance in Multilingual Contexts: Issues and Challenges¹



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Abstract

Literacy is perhaps the most fundamental skill required for effective participation in education (formal and non-formal) for national development. At the same time, the choice of language for literacy is a complex issue in multilingual societies like Nigeria. This paper examines the issues involved, namely language policy, language and teacher development, and the role of distance education and information and communication technologies (ICTs), in making literacy accessible in as many languages as possible. Two distance learning literacy projects are presented as case studies and the lessons learned are discussed. The findings of this study suggest that although there is evidence of growing accessibility to ICTs like mobile phones, their use and success to increase access to literacy in the users' languages are yet to be attained or maximised. The implication of the lessons learned should be relevant to other multilingual nations that seek the goal of increasing access to learning and promoting development so as to harvest economic benefits.

Keywords: Literacy; multilingual societies; ICTs, case studies; development

Introduction

The role of literacy in the development of a nation cannot be overemphasised. As a basic human right and index for human development, literacy is at the core of UNESCO's Education for All (EFA) initiative. According to EFA's global monitoring report for 2006 (p.27), literacy skills are deemed essential in "today's knowledge societies, conferring benefits on individuals, communities and nations." The report also states that literacy was "one of the most neglected of the six goals adopted in 2000 by 164 countries at the World Education Forum in Dakar, Senegal." Global trends in literacy show that

- a majority of illiterate populations is found in developing countries;
- although the population of literate young people has improved significantly, 132 mil-

lion youth worldwide are unable to communicate in a written language;

- there is a tendency for rural populations to have lower literacy levels than urban populations;
- illiteracy rates are highest in countries with the highest poverty rates; and about half of the world's population lives in nine highly populated developing countries called the E-9 (E for education and 9 for nine countries), and they account for 40% of school dropouts and 70% of the world's illiterate adults (EFA 2005); the E-9 countries include Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Pakistan, and Nigeria.

The presence of Nigeria among the E-9 underscores the challenge of literacy development amidst a large population and a large number of languages. Language is central to achieving literacy whether through formal or non-formal education. The ability to read and write in a language, whether it is exogenous or indigenous, constitutes an integral part of defining a literate individual. UNESCO (2003, cited in Robinson, 2007) reiterated its position on the role of mother tongues in education and the implementation of language policies:

UNESCO supports mother tongue instruction as a means of improving educational quality by building upon the knowledge and experience of the learners and teachers.

UNESCO supports bilingual and/or multilingual education at all levels of education as a means of promoting both social and gender equality and as a key element of linguistically diverse societies. (p. 60)

It is often the case in multilingual societies that many individuals do not have access to education because they are not literate in the choice of language of instruction. National language policies and the designation of languages for various purposes, including medium of instruction for formal and non-formal education, “can facilitate or hinder language development and literacy acquisition” (EFA 2005, 24). This study examines Nigeria's attempt to address the language issue through her language policy as a means of increasing accessibility to literacy. The lessons learned should be worthwhile for other multilingual nations. The role of language in the use of distance education and information and communication technologies (ICTs) to promote literacy is also examined through two case studies.

The Role of Language in Literacy

Although definitions of literacy have broadened over the years to include a wide range of skills, the basic skills of reading and writing remain at the core of any definition of literacy, while numeracy skills are viewed as supplementary. Also, these definitions do not specify language of literacy, thereby leaving the decision to individual countries. UNESCO's (EFA, 2005) long-standing definition of basic literacy does not specify the language of literacy: “A literate person is one who can, with understanding, both read and write a short simple

statement on his or her everyday life” (p.153).

Neither is the language of literacy specified in UNESCO’s definition of functional literacy:

A person is functionally literate who can engage in all those activities in which literacy is required for effective functioning of his (or her) group and community and also for enabling him (or her) to continue to use reading, writing and calculation for his (or her) own and the community’s development. (p.30)

Indeed, there is evidence to support expanded definitions that take into account continuous acquisition of new skills such as those brought about by the technological age. There is some evidence that points to a growing number of educated but functional illiterates who are unable to perform certain daily tasks that characterise the current information technology age such as the ability to use the basic functions of a mobile phone (Ofulue, 2008). McCaffery et al. (2007) offer a layered view of literacy comprising *skills, tasks, practices*, and *critical reflection*, and emphasis could be on any layer depending on the purpose:

Literacy is rooted in the *skills* of reading and writing. These skills are used by individuals to accomplish *tasks* in their daily lives. These tasks are part of their literacy *practices*, socially and culturally rooted in the communities in which they live and work. Literacy can be a means for *critical reflection* on the world as a necessary part of becoming capable of creating change. (p.41)

There are also country-based definitions of literacy, which, in general, reflect its core concept, that is the ability to read and write, but with some variations. These various definitions, which have implications for how literacy is measured, vary in their language considerations, for example ability to write with understanding 1) in any language, 2) in a specified language, and 3) in at least one language. However, the critical question remains, in which language is attainment of literacy being measured and, by implication, in which language(s) is literacy learned or practiced? Based on research, which has shown that acquiring literacy in one’s mother tongue enhances access to literacy in other languages, UNESCO (2003) has consistently encouraged the use of the mother tongue in education. The reality, however, is that many children around the world begin their schooling using a second language (Ouane 2003, EFA 2010). And many others are excluded by virtue of the non-availability of literacy opportunities in their mother tongues. With greater attention being paid to the role of language in literacy, the issue of in which language literacy should be learned becomes a very important consideration. The issue is even more critical for multilingual contexts like Nigeria. The linguistically diverse nature of Nigeria’s language terrain has made this question a difficult and complex one to answer over the years and even more so in the current dispensation where additional variables, such as the negative effect of the minority/major language dichotomy on minority languages, are observed.

Nigeria's Demographic, Language, and Literacy Profile

Nigeria is the most populous country in Africa and the ninth most populous country in the world with a linguistically diverse population of over 140 million people, about 510 spoken languages, and a literacy rate of 66% (UNICEF, 2009; Ethnologue, 2009). Population size is a key criterion for the classification of *major* versus *minor* languages. Approximately half of the population speak the three major languages, Hausa, Igbo, and Yoruba, as first or second languages. Regional languages are spoken by about one tenth of the population, namely Fulfulde, Nupe, Kanuri, Idoma, Tiv, Ibibio, Edo, Efik, and Ijaw, while the remaining languages are small group/minority languages. Many of these languages, especially the small group languages, have not been developed; they do not have orthographies and have not been assigned any significant role. Adebija (2004) observed that only about 65 Nigerian languages have orthographies. English is Nigeria's official language and language of education; thus, it dominates the sociolinguistic space in terms of attitudes, power, and socioeconomic mobility. Going by Nigeria's literacy rate, about 66% of the population is literate in English, but there is no precise figure. The percentage given in this study is the percentage for the literate population in Nigeria as reported by UNICEF (2009), and it is based on school enrolment figures with English as the language of education. However, Adebija (2003) was of the view that the population of English speakers is less than 20%. Adebija (1994) aptly surmises the linguistically diverse nature of Nigeria's population when he notes that "although precise statistics are not available, one can safely conclude from the evidence available that no language in Nigeria is spoken by as many as 50% of the entire population as a first language" (p.16).

Based on Bamgbose's (1991) language topology, Nigeria shows the participation of at least five language types for literacy and communication and is illustrated in Table 1.

Table 1

Language Typology

SN	Language type	Function	Languages involved
1	Mother tongue	Medium of informal education in the home and among peers within immediate community	All Nigerian languages
2	Language of immediate community	Local or regional lingua franca	All Nigerian languages, minority languages in particular
3	Language of wider communication	Wider reach for education, and communication as lingua franca, national language. Also, official language which is second language for most and first language for a growing number.	Official (English) national (Hausa, Igbo and Yoruba) and regional (Fulfulde, Nupe, Kanuri, Idoma, Tiv, Ibibio, Edo, Efik, and Ijaw).

4	Language of religion	Language of religious communication	Arabic
5	Language of wider communication	International communication	French

Source: Bamgbose (1991)

Research has shown that the most effective choice of language for basic literacy should be the language the child or adult is most familiar with (Adebijia, 2003). The language for conducting subsequent phases of literacy will depend on several factors, including the learner's profile (age, language needs, attitudes, and language skills already acquired) and the level/type of interaction with the immediate and wider society. These as well as other factors such as the historical experience, sociolinguistic features, and nationalistic views are considered in the choice of languages for education in Africa (Obanya, 2004, p.225). Nigeria's profile illustrates the complexities of language issues in multilingual nations as they seek ways to achieve mass literacy in learners' multiple languages.

Language Policy and Literacy

Language policies play a significant role in the spread of literacy. There is a strong link between language policies and the attitudes towards choice and development of indigenous languages. As noted in the EFA report (2005),

Language policies and practices have played, and continue to play, an important role in literacy and the development of literate communities. National language policies – the designation of an official language, the choice of language of instruction in schools and adult learning programmes – can facilitate or hinder language development and literacy acquisition. Research consistently shows that learning to read and write in one's mother tongue enhances access to literacy in other languages. Yet literacy efforts in many countries lack a clear language policy. (p.24)

Nigeria's language policy is embedded within its education policy with the ultimate goal of promoting literacy in the English language while also achieving a degree of proficiency in a select number of Nigerian languages. The National Policy on Education (2004) states:

Government appreciates the importance of language as a means of promoting social interaction and natural cohesion; and preserving cultures. Thus every child shall learn the **language of the immediate environment**. Furthermore, in the interest of national unity it is expedient that every child shall be required to learn **one of the three Nigerian languages: Hausa, Igbo and Yoruba**. For smooth interaction with our

neighbours, it is desirable for every Nigerian to speak French. Accordingly, **French shall be the second official language** in Nigeria and it shall be compulsory in primary and Junior Secondary Schools but a Non-Vocational Elective at the Senior Secondary School... The medium of instruction in the primary school shall be the language of the environment for the first three years. During this period, **English** shall be taught as a subject. From the fourth year, **English** shall progressively be used as a medium of instruction and the language of the immediate environment and French shall be taught as subjects. (pp.5, 10-11)

In principle, Nigeria's language policy on education prescribes a role for all Nigerian languages that are languages of the immediate environment as languages of instruction for pre-primary and the first three of six years of primary education. English is prescribed as a medium of instruction from the fourth year of primary education onwards, and as a subject. A minimum of one national language is prescribed for learning as a subject at the secondary education level. French is a recent feature in the policy as a second official language and is prescribed for learning as a subject. In other words, the learner should be literate in a minimum of three to four languages at the end of 12 years of formal schooling. The policy is silent on the language of instruction for mass literacy, adult, and non-formal education. The assumption is that the language of instruction would be in the language of the immediate environment.

Language policies affect attitudes because prescription of which language should be used for what is a key factor that affects the attitudes of groups towards their mother tongues (Ouane, 2003). In countries like Nigeria where the policy assigns important roles to the exogenous language, that is English, it is only natural that attitudes towards learning using the mother tongue will suffer. By virtue of its accorded status, there is a greater motivation toward acquiring English via formal education than toward acquiring Nigerian languages. Although the policy prescribes a function for Nigerian languages, the cost of promoting learning in multiple languages is often cited as a major challenge to its implementation. The result is a migration to languages of instruction within the immediate environment for which materials are available. Urban/rural population statistics for Nigeria show that a greater percentage (52%) of the population lives in rural areas where the mother tongue is usually the first and sometimes only language spoken by pre-primary school learners. The language policy, as practiced, excludes a fair percentage of these learners from literacy because the language of instruction is not their mother tongue. In the urban setting, it is doubtful that the policy is being implemented as most schools use English as the preferred medium of instruction. Language policies should be designed to promote literacy in the mother tongues by assigning to them functionally significant roles that are equally as important as those assigned to the languages of power, which are used to attract positive economic and social benefits to the speakers and thus have a positive impact on learners' at-

titudes towards their mother tongue. Based on the Indian experience, Rao (2007) observes that a clearly articulated framework for achieving literacy is a major factor in ensuring effective implementation of sound policies. Such a framework should adopt a multilingual approach for the training of teachers to teach in multiple languages and for the development of both teaching and supplementary reading materials in multiple languages.

Teacher Development

The EFA (2005) report notes the vital importance of teachers to the success of literacy programmes, yet the lack of adequate and regular remuneration, job security, training opportunities, and continuous professional support have undermined their importance. The report also states that “unless the professional development of literacy educators and their trainers is taken seriously, progress towards more literate societies will be severely constrained” (p. 35). Teaching within multilingual contexts is often beset by problems of language materials, curriculum, time allocation, and availability of teachers (Bangbose, 1991; Obanya, 2004). Instructional delivery is still very much dependent on traditional text methods in the absence of other forms of resources. Traditional methods require large numbers of teachers, infrastructure, and language materials. Although these issues are not unique to language teaching, coping with multiple languages that require a multiple number of teachers and materials becomes an issue. As is the case with highly populated countries burdened with high budget requirements for formal and informal education, the implementation of a language policy involving multiple languages for literacy becomes an additional burden. Although teacher development has improved over time, the EFA progress report notes that in many developing countries including Nigeria, there is still a shortfall in the number of trained teachers. To address the problem, a focus on teacher development was adopted as one of the resolutions at the 7th Ministers’ Review Conference of E-9 countries. However, the training of teachers in the language(s) for literacy should perhaps be given more emphasis than it currently receives because the acquisition of language skills is the basis for literacy and subsequent skills for development.

Multilingualism and Language Development

In addressing issues of multilingualism in adult literacy, Robinson (2007) states:

Literacy is about communication and is therefore fundamentally a language-based activity; there can be no discussion of literacy without asking in which language literacy will be acquired and practised and this implies a clear knowledge of what languages specific groups of people use for communication in their daily lives. (p.59)

There is a strong link between language and literacy especially in multilingual contexts where the language for formal education is often prescribed, while that of informal education is usually negotiated depending on the language of the immediate or wider community and on the availability of teaching resources in that language. The number of languages recommended by the policy implies that a learner will be exposed to at least four languages

apart from the mother tongue over a period of 12 years of schooling. Indeed, linguistic diversity appears to be a crucial factor in accessing learning in correlation with high population, poverty, and literacy rates. According to the EFA (2006) report on literacy,

A majority of countries facing salient literacy challenges are linguistically diverse. Decisions on language must balance political and ethnic sensitivity, pedagogical effectiveness, costs and learner preferences. The extra cost of training teachers and developing materials in multiple languages must be weighed against the inefficiency of teaching in languages that learners do not understand. A multilingual policy should also ensure that learners have opportunities to gain literacy skills in a second/official language that may be of wider use. (p.25)

Table 2 presents comparative information on the linguistic diversity that exists in the E-9 countries and literacy rates, population, and poverty.

Table 2

E-9 Countries' Statistics

	Country	Population	Languages		Literacy rates (adult and youth) %	Population living below USD1.25/per day
			Number	Diversity Index*		
1.	China	1,345,751,000	296	0.509	96.5	16
2.	India	1,198,003,000	445	0.940	75	42
3.	Indonesia	229,965,000	722	0.816	95	29
4.	Brazil	193,734,500	193	0.103	95	5
5.	Pakistan	180,808,000	77	0.762	64	23
6.	Bangladesh	162,221,000	46	0.387	68	50
7.	Nigeria	154,729,000	521	0.869	66	64
8.	Mexico	109,610,000	297	0.137	95.5	4
9.	Egypt	82,999,000	27	0.536	79	2

Sources: UNICEF (2009); Ethnologue (2009). *The Index column reports Greenberg's diversity index. This is the probability that any two people of the country selected at random would have different mother tongues (Liebersohn, 1981). The highest possible value, 1, indicates total diversity (that is, no two people have the same mother tongue) while the lowest possible value, 0, indicates no diversity at all (that is, everyone has the same mother tongue). The computation of the diversity index is based on the population of each language as a proportion of the total population (Ethnologue, 2009).

In Table 2, at least six of the E-9 countries have at least 190 languages or more. Figures for Nigeria and India show the highest correlation through high number of languages, low literacy rates, and high poverty rates. Although literacy rates have improved generally among the E-9 countries, Nigeria has the highest percentage of population living below the international poverty line at 64% and the second lowest for literacy rate at 66%. With about half of the Nigerian population under the age of 18 years, these figures have significant implications for both human and economic resources. Multilingualism is a key factor in countries like Nigeria because it constitutes an additional socioeconomic burden, which in turn has a negative impact on literacy efforts as a result of learners who are denied access by virtue of the non-availability of literacy materials in their languages. As noted previously, the economic challenge of training teachers and developing materials in multiple languages must be weighed against the inefficiency of teaching in languages that learners do not understand (EFA, 2006). The benefits of using multiple languages include the removal of the language barrier and expansion of access to literacy. Thus, learners are able to access literacy in their mother tongues without having to first learn another language based on the premise that literacy is most effectively acquired first in the mother tongue or in learners' first language. Note also that literacy in the mother tongue facilitates the acquisition of literacy in other languages.

Promoting Literacy Using Distance Education and ICTs

There is general consensus that distance learning and ICTs can provide opportunities for formal and non-formal literacy learning by adults, though access to technology is highly uneven in many places. It has also been noted that ICTs and distance learning have more immediate potential for offering professional development to literacy educators rather than for running literacy programmes (EFA, 2006, p.25). Unfortunately, ICTs rely on international languages and are therefore often not readily accessible to learners as is the case in countries like Nigeria (Pennells, 2005). Access to literacy in multiple languages is perhaps the greatest challenge for multilingual societies. In addressing the issue of access, the E-9 countries recognised ICTs and distance education as important tools to improve teacher development. By extension, access to literacy should also be positively affected because teacher development is a key factor in promoting literacy. The need for distance education to be mediated by ICTs is borne by the factors of limited access to resource materials in multiple languages for learning, the cost of developing them, lack of trained teachers to facilitate the learning process with attendant costs, and lack of opportunities for learners (exposure to information and use) to develop their language skills. Because language learning is a skill-based venture, it requires ample opportunity (exposure and use) to ensure the development of the skills. Distance education and ICTs make it possible to take learners' characteristics into consideration in the selection of the language for instructional delivery and thereby ensure that learning is conducted in the learners' first language at minimal costs.

A National Information Technology (IT) policy was approved for Nigeria in 2001. The National Information Technology Development Agency (NITDA) and the Nigerian National

ICT for Development (ICT4D) Strategic Action Plan Committee were established to drive the implementation of the policy. Encouraging the use of ICTs in education is one of the objectives of the policy. Such a policy should serve as a catalyst to making mass access to learning possible through the use of appropriate technologies. While there have been experiments with the use of print, radio, and television in mass literacy projects, the possibilities of using newer ICTs are yet to be fully maximized for learning. The phenomenal growth in the use of mobile phones in Nigeria is an example of new ICTs with potential benefits for literacy efforts. From less than 1 million fixed and mobile lines in 2000, when the new telecommunications policy was enacted, to over 92 million subscribers 10 years later and with a projected growth rate of 25% per annum, mobile telephony has the potential not only to close the developmental gap, but also to provide access to learning for development in Nigeria. Teledensity was at 0.33% in 2001 and rose to 56.32% by 2010 (NCC, 2010; Pyramid Research, 2010). There has also been appreciable growth in the spread and rural penetration of mobile telephony with 83% coverage of the population (World Bank, 2008). Mobile telephony has overtaken use of the Internet, which stands at 16% of the population, and television users, at 25% of the population (World Bank, 2008; Internet World Statistics, 2010). This wide margin is not unrelated to the fact that it costs five times more to access the Internet than to access the mobile phone.

Pennells (2006) is of the view that despite the significant growth of the telecommunications industry in Africa and of mobile telephones as the “telecommunication medium of choice,” including their use in distance learning to send short text messages to learners and for communication between learners and their instructors, mobile phones are not likely to have a major impact on mass education due to affordability by many non-literate people and literacy programmes (p.34). However, research shows that literacy not affordability is the major obstacle to the mobile phone being used to support mass education. In a comprehensive study on mobile telephony in Nigeria, Tiemo (2006) reports that this ICT tool has proven to be very successful and sustainable among the rural Nigerian population. However, low levels of education and illiteracy reinforced by poverty are among the factors limiting access to ICT infrastructure in developing countries and especially among women (2006, p. 24). In a study conducted among rural women mobile phone users, it was discovered that language constituted a major barrier in their ability to operate their phones even though they were literate in their indigenous languages (Tiemo, 2006, p. 87). The study recommended that indigenous languages should be taken into consideration in the production of mobile phones, and education programmes for users should be conducted. Because 52% of Nigeria’s population is rural and literacy figures are lower among this group, there is significant justification for this recommendation. With various recorded successes of rural mobile telephony, this ICT tool has the potential to be used for promoting literacy. However, the indigenous languages will need to be given more prominent roles because they are often the first and perhaps only language of the learners. Elsewhere, in Bangladesh for example, mobile technologies with literacy-learning facilities for various non-literate groups are being utilised with subsequent improvement in “literacy rates as well as in health, girls’ school enrolment, and use and conservation of water systems” (COL 2005; Rezwani, 2004, cited in Pennells, 2006, p. 21). It is possible that the benefits accrued by mobile technologies in

Bangladesh could materialize in Nigeria.

Case Studies of Literacy Projects at a Distance

Although print has remained the main medium for literacy because of its relative affordability and accessibility compared with electronic media, ICTs offer better possibilities for creating access to learning. Pennells (2006, pp. 21, 34) notes that radio has “continuing potential for use in literacy development,” particularly among learner groups who are separated by distance. He reports that the use of distance learning as a support to literacy development has been very significant in the area of teacher training, particularly in Africa using a blended approach of face-to-face and ICT-mediated instruction. Aderinoye et al. (2007) corroborate the relevance of the radio in promoting literacy in the indigenous languages in Nigeria. Two examples of literacy programmes mediated by technologies are presented below.

Literacy-by-Radio Programme

A National Commission for Mass Literacy, Adult and Non-Formal Education was established in 1990 as part of Nigeria’s response and commitment to attaining the EFA goals. It is instructive to note that the major problems in implementation as identified by the Commission are the same as those affecting the delivery of formal education. They include funding, infrastructure, teaching personnel, and community ownership (Khalid, 2004 p. 28). These problems are also the reason the Commission suffered a setback in carrying out its mandate. However, the government has renewed its commitment to EFA and has agreed to achieve the EFA goals by 2015.

The Literacy-by-Radio project is one example of an implementation step toward the attainment of EFA by 2015. The project was inaugurated in 2004 by the Federal Government of Nigeria in collaboration with UNESCO through the National Commission for Mass Literacy, Adult and Non-formal Education (NMEC) with technical input from Cuba.

During the pilot stage of the project, 12 states were used, two each from the six geopolitical zones of the country. At the state level, local governments were selected to participate in the project. For example, reports from Niger state show that two local governments, Agaie and Lapai, each with five communities were selected to participate in the project. As part of their contribution and as a means of owning the project, the local governments provided 10 facilitators, translation and production of primers, and monitoring facilities. Facilitators went through two weeks of training. A total of 213 females and 6 males in the two local government areas participated in the programme. Based on the Cuban model, a blended approach combining listening to radio broadcasts of the lessons with specially designed primers that use pictures and signs to guide the learner in acquiring literacy and numeracy skills in the language of the immediate environment and periodic face-to-face interactive sessions with facilitators was adopted. The instructional materials were scripted for radio broadcasts in Nupe, the language of the immediate environment. The radio broadcasts were used to supplement the face-to-face interactive sessions with the learners. Learners

met at a specific time and location to listen to the broadcast. Assessment of learning was conducted at the end of the period. According to the report, the success rates of the Literacy-by-Radio programme were better than that of the conventional method. For example, the dropout rate was lower in comparison; it was more effective for adult learners; and learners developed literacy skills within a shorter period (Niger State Agency for Mass Education, 2008). The results of the evaluation commissioned by UNESCO also showed “that learner enrolment projections were exceeded in many instances (often by as much as 50%) and that the project can be adjudged a success in every sense” (UNESCO, 2007). Having recorded a significant level of success, the government is supporting the scaling up of the programme to cover the entire country. The 36 states and the Federal capital territory are reported to have produced lessons in various local languages for broadcasting. Learners are expected to acquire basic literacy skills in their indigenous languages within three to four months (Khalid, 2009)

The successful outcomes recorded for the pilot project were aided by local community ownership and the significantly higher participation of women than men during the pilot stage of the programme. In Niger State, the lack of continuous funding and increased participation were identified as major threats to long-term sustenance of the project. A holistic evaluation of the project showed that if any meaningful mass literacy is to be achieved in Nigeria, the use of radio is appropriate to address problems of “multilingual context, culture, distance from one community to another, and ethnicity” (UNESCO, 2007).

Recently, the Commission received a boost when additional funds were released for the continual airing of the Literacy-by-Radio programme and the supply of 100 radio sets to each of the 774 local government areas in the country and the training of 1,800 facilitators (Daily Champion, 2010). The project is an example of basic, low-end literacy programming in which the use of learners’ indigenous languages undoubtedly contributed to its recorded success.

Virtual Teacher Training Programme

The Virtual Institute for Higher Education Programme (VIHEAP) and the Virtual Institute for Higher Education in Africa (VIHEAF) were launched in 2003-2004 as collaborative initiatives between the National Universities Commission (NUC) and the UNESCO Harare Cluster office. The institutes were established for the purpose of developing capacity at the individual and institutional levels in the Africa region through the provision of online programmes. The target audience included higher education teachers.

The aim is to provide programmes that support the development of pedagogical skills as part of NUC and UNESCO’s contributions to improving the quality of teaching and learning in schools across sub-Saharan African countries. The objectives include the following: provision of Internet-based training on modern methods of teaching and learning in higher education; the upgrade of knowledge and skills on topics such as teaching large classes, effective utilisation of (meagre) resources, modern methods of assessment and evaluation of students’ performance, basic guidance and counselling techniques, basic skills of curriculum development, and techniques for writing winning grant proposals; information on

best practices in university teaching and how to deal with academic and social vices such as examination malpractice, plagiarism, and cultism; and current information and skills in HIV/AIDS education.

The first year of the programme constituted a pilot study on conducting training at a distance via the Internet. Over 400 teachers registered to participate in the programme. The language of instruction was English. The content was assembled into modules. Each module was made up of lessons divided into sub-topics. Each module contained an introduction and a set of objectives. The lessons included an introduction, objectives, structured content, summary, and references to consult for further reading. Figure 1 presents a graphic illustration of a lesson.

Lesson 1

Let pupils know that there are no documented cases of HIV being transmitted by tears or saliva, but it is possible to be infected with HIV through oral sex or in rare cases through deep kissing, especially if you have open sores in your mouth or bleeding gums.

Conclude with the discussion on the cure for AIDS that currently, there is no cure for AIDS. There are drugs that can slow down the HIV virus, and slow down the damage to the immune system. But there is no way to get all the HIV out of the body.

Assist pupils to develop a simple concept map of the lesson. An example is given below.

Key Point to Remember

In Summary

In this lesson, we learned that

- HIV is the shortened form for **H**uman **I**mmunodeficiency **V**irus.
- A virus is an infectious agent that is found in virtually all life forms consisting of two major parts- an outer protective coat called a **capsid** which is made of protein; and an inside which consists of genetic material- **DNA** or **RNA**.
- HIV mostly infects T-cells, also known as CD4+ cells, or T-helper cells. These cells are white blood cells that turn the immune system on to fight disease. Once inside the cell, HIV starts producing millions of little viruses, which eventually kill the cell and then go out to infect other cells.
- There are two types of this virus: HIV-1, which is the primary cause of AIDS worldwide, and HIV-2, found mostly in West Africa.
- AIDS is a shortened form for **A**cquired **I**mmune **D**eficiency **S**ndrome). It is a condition caused by HIV.
- Most people get the HIV virus by having sex with an infected person; sharing a needle or sharp instruments with someone who's infected; and being born when the mother is infected, or drinking the breast milk of an infected woman.

We also learned how to teach the lesson to our pupils using three charts and a concept map.

Lesson Objectives

After completing this lesson, you will be able to:

- give the full meanings of HIV and AIDS;
- explain what a virus is;
- name two types of HIV; and
- state how HIV is contracted.

Basic Content

HIV is the shortened form for **H**uman **I**mmunodeficiency **V**irus. It is a virus, such as the virus that causes the flu or cold. A virus is a minute particle that lives as a parasite in plants, animals, and bacteria. It consists of an inside (core) made of a substance known as **nucleic acid** and an outside (sheath) made of **protein**. Viruses can only replicate within living cells and are not considered to be independent living organisms.

Figure 1. VIHEAF online lesson (source: www.ibe.unesco.org).

Students are required to participate in online discussions, quizzes, and a test or project at the end of the module. The programme, which assumes computer literacy skills as a prerequisite for participation and literacy in the English language, is an example of a further high-end literacy programme. It is worthy of note that the online programmes that had been discontinued after their first year were resuscitated and merged in 2008 under the auspices of UNESCO and Bamako cluster office as a programme in collaboration with the NUC and partners, including the Association of African Universities (AAU) and Association for the Development of Education in Africa (ADEA). The online delivery system has also been updated with additional new courses in response to demand (UNESCO, 2009).

Lessons Learned from the Case Studies

The main lessons learned from the two case studies described are summarised as follows.

- The comparatively significant success rates reported for the pilot phase of the Literacy-by-Radio programme confirm that radio remains a basic, relevant, useful, and effective tool with the potential of reaching more people, who are separated by distance, in the language of their choice.
- Ownership of the project through collaboration with local stakeholders is a key factor to the success of these projects.
- It is important that plans and logistics for the sustainability and long-term maintenance of literacy programmes are a part of the initial project framework because the lack of a long-term plan constitutes a major threat to positive cumulative outcomes of these literacy projects.
- Newer technologies like computers, Internet, and electronic training materials are very useful for continuing professional development purposes, such as the training of facilitators and teachers.
- Contrary to some views cited earlier, there is great potential for the use of modern ICTs such as mobile phones for mass access to learning at a distance in multiple languages.

Distance learning using ICTs can extend the reach of literacy programmes to learners in multiple languages. However, the success of such programmes is dependent on proper consideration of learners' needs and the language of instruction. The success recorded in the Indian experience, such that literacy rates improved by 65%, is attributed in part to the careful selection of the language used and the careful preparation of teaching-learning materials so that content was relevant to the learners and contained illustrations, exercises, and self-evaluation at the end of each unit (Rao, 2007). Adapting to new technologies like mobile phones is not likely to pose challenges to young learners in the 21st century, who have been observed to take to the use of technologies faster and more easily than adults (Kanwar, 2008). Adult learners on their part have been noted to tend to prefer to learn in regional or national language(s) because of the immediate socioeconomic benefits to them (EFA 2005, p.204). For both groups, access to literacy mediated by ICTs is beneficial. Reporting on a case study of illiterate rural adult mobile phone users in Nigeria, Tiemo (2006) showed that the socioeconomic benefits they derive make mobile phones a successful and sustainable tool for mass access. However, they are not able to maximise the use of their phones due to literacy/language barriers.

Conclusion

The aim of this paper was to examine the issues associated with promoting literacy for development amidst a linguistically diverse society like Nigeria and the contributions of distance learning using ICTs to achieve this goal. As one of the key factors for sustainable development and for achieving the EFA goals and Millennium Development Goals (MDGs), it is necessary to develop cost-effective and sustainable ways of creating mass access to literacy. Based on the premise that learning is best conducted in the learners' first language,

literacy should be provided in a language that is most accessible to learners and that is most relevant for their needs. But because there are multiple first languages, with financial constraints affecting language development and teacher development, access to literacy programmes in the learners' first language remains a problem in Nigeria and consequently a barrier to development.

The findings of this study suggest that although there is evidence of growing access to ICTs like mobile phones, their use and success to increase access to literacy in users' languages, similar to the economic benefits that have been achieved, are yet to be attained and maximised. Opportunities for literacy should be encouraged using as many languages as possible, and distance learning makes it possible to turn the complexities of linguistic diversity into gains through the use of appropriate technologies that are accessible and that meet the needs of the learners. In view of this positive trend in Nigeria and given the linguistically heterogeneous context and the diversity of literacy needs, the adoption and adaptation of new technologies to learning among both young and adult learners needs to be explored further.

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Notes

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Athabasca University 



Distance Students' Readiness for Social Media and Collaboration



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Abstract

In recent years, there has been a rapid growth in the use of social networking tools (e.g., Facebook) and social media in general, mainly for social, recreational, and entertainment purposes (Smith, Salaway, & Caruso, 2009). Many educators believe that these tools offer new educational affordances and avenues for students to interact with each other and with their teachers or tutors. Considering the traditional dropout rate problem documented in distance courses (Rovai, 2003; Woodley, 2004), these tools may be of special interest for distance education institutions as they have the potential to assist in the critical “social integration” associated with persistence (Sweet, 1986; Tinto, 1975). However, as distance students are typically older than regular on-campus students (Bean & Metzner, 1985; Rovai, 2003), little is known about their expertise with social media or their interest in harnessing these tools for informal learning or collaborating with peers.

To investigate these issues, an online questionnaire was distributed to students from four large Canadian distance education institutions. A systematic sampling procedure led to 3,462 completed questionnaires. The results show that students have diverse views and experiences, but they also show strong and significant age and gender differences in a variety of measures, as well as an important institution effect on the student’s interest in collaboration. Males and younger students scored higher on almost all indicators (past teamwork experience, cooperative preferences, attitudes toward technology, experience with social software, etc.). These age and gender differences should be interpreted cautiously, however, as they are based on self-reported measures. The limits of the study, as well as future developments and research questions, are outlined.

Keywords: Distance education; social software; web conferencing; collaboration; social presence; technology; transparency

In recent years, the Web has been radically transformed, shifting from an information repository to a more social environment where users are not only passive receivers or active harvesters of information, but also creators of content, or “producers” (Bruns, 2008). Even if the term itself is contentious, “Web 2.0” is used to characterize a web environment that is moving from publishing to participation, contribution, and user-defined content creation and organization through posting, commenting, tagging, and folksonomy creation. The use of social software and social networking has been growing exponentially with applications in social, gaming, media, business, and education contexts. For example, Facebook is now the second most frequented site (just after Google) in North America (Alexa, 2011) and claims over 750 million members (Facebook, 2011).

The term *social software* refers to a set of network tools designed specifically to support sharing, collaborating, and socializing, resulting in the development of multiple forms of social capital (Jones & Thomas, 2007). Though (currently) much less popular than commercial and entertainment uses and definitions, educational social software was defined in 2005 as “networked tools that support and encourage individuals to learn together while retaining individual control over their time, space, presence, activity, identity and relationship” (Anderson, 2005). Social software tools or functions include profiles, wikis, blogs, microblogging (e.g., Twitter), social bookmarking, wall posting, photo and video sharing and tagging, and calendaring, to name only a few. Social networking sites such as Elgg, Ning, and Facebook typically offer a number of these functions in a single environment.

Social software is used primarily for informal and recreational use (Smith, Salaway, & Caruso, 2009). However, we argue that it also offers new educational affordances that can be exploited in formal learning. The educational use of wikis and blogs is increasing (Richardson, 2006). Some educational uses of Facebook are also emerging, including a large number of educational institutions having Facebook pages and “communities” of students. Dron and Anderson (2007) note that an essential characteristic of social software is that it scales well and gains strength from large numbers of users, thus making them attractive and cost-effective for use in both campus and open and online education contexts.

It has been noted that while educators have been thinking a lot about formal groups in education (e.g., classes, and structures to support collaborative learning), new types of “network” and “set-based” collaboration are also emerging (Dron, 2010; Dron & Anderson 2007, 2009). In research using the social software platform Elgg, Garrett, Thoms, Soffer, and Ryan (2007) found that access to peer work and peer relations improved both the perception of social presence and students’ motivation.

In recent years, with larger bandwidth availability to a large public, the use of real-time web conferencing software (such as Elluminate, WebX, and Adobe Connect) has also been growing. These systems use real-time audio-video communication systems to simulate classroom-based learning, and, in some ways, add functionality to go beyond classroom-based learning, including diverse collaborative functions such as document sharing, whiteboard, chat, polling, and application sharing.

Problem and Conceptual Grounding

The number of students registering in online courses in higher education is increasing steadily compared to on-campus registrations (Allen & Seaman, 2010). But distance education (DE) and online courses suffer from higher attrition rates than campus-based offerings (Bernard et al., 2004). This phenomenon is particularly acute for the self-paced and continuous enrollment forms of distance education (Misko, 2000, 2001). Self-pacing and continuous enrollment increase flexibility for students and teachers, yet this flexibility comes at a cost of greater requirements for student motivation, self-direction, and discipline.

While persistence involves a complex set of individual, demographic, socioeconomic, and environment variables (Bourdages & Delmotte, 2001), only learner support systems, instructional designs, and other institutional variables are controllable by the distance education institution and thus can potentially be manipulated to improve persistence rates. Most avenues explored to enhance persistence in DE courses focus on the enhancement of student support systems through individual tutoring, peer collaboration, and face-to-face meetings (Gagné, Deschênes, Bourdages, Bilodeau, & Dallaire, 2002). Web conferencing systems are increasingly used as tools to replace face-to-face meetings or to mimic the traditional class environment, with some positive impacts on persistence (Bernard et al., 2004).

Typically in distance education, and entirely in self-paced models, students remain invisible to each other—often as a result of increasing constraints on institutions when it comes to releasing personal and private information about students. Social software and web conferencing tools offer new interaction affordances as well as new forms of collaboration. In addition, with such technology, students and instructors can become more directly visible to and socially present with each other.

Social Presence

The notion that a sense of presence can be conveyed through technology has been the object of many studies in the educational and media domains. The diversity of concepts used to discuss the topic demonstrates this interest: social presence, telepresence, transactional distance, immediacy, and transactional presence. The term “social presence” has been defined in a number of significantly different ways. This term originated in the field of communication psychology and was first defined as “the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships” (Short, Williams, & Christie, 1976).

The theory of the richness of media is often invoked to explain the differences in the potential of various media to convey a social presence. *Wealth of information* is defined as a capacity for information to impact understanding within a given time frame (Daft & Lengel, 1986). According to this theory, if a medium is very visual and highly interactive, it will provide a wealth of information and will more effectively convey a sense of social presence. Some research results indicate precisely that when given the choice, educators and learners have a preference for synchronous tools (Poellhuber, 2007), that is web videoconferencing.

Conversely, lean media, notably text, was originally thought of as lacking the capacity to support high levels of social presence. Research and common experience show that learners are capable of both appropriating and extending media to overcome such limitations, notably in the development of emoticons and specialized lingo (Rourke, Anderson, Archer, & Garrison, 1999).

Transparency

Transparency—in the sense of allowing individuals to observe, compare themselves with, and emulate others—is a feature of many social networking and Web 2.0 applications. For example, being able to observe the books purchased by others who have purchased a book in which you are interested provides important commercial and personal information to both consumers and online book retailers. Transparency in educational contexts has been elaborated on by Dalsgaard and Paulsen (2009), who argue that transparency, or “students’ and teachers’ insight into each other’s activities and resources,” is critically important to create conditions under which students will volunteer and can productively cooperate with others in learning activities. Transparency is a unique feature of social networking services and a component that has formerly been denied to distance education students, especially those distance students engaged in self-paced or continuous enrollment modes of DE. Transparency affords students insight into each other’s actions, ideas, backgrounds, understanding, and contexts.

The potential of synchronous web conferencing systems and of social software to convey transparency and social presence may offer new avenues for student learning and support systems in distance education. In summary, we believe these tools hold strong theoretical promise to support interventions designed to improve learning, increase student engagement, and alleviate the high dropout rates traditionally observed in distance education.

Collaboration

Are distance students interested in collaborating with peers? While certain researchers show that some students are (Anderson, 2005; Caspi & Gorki, 2006), others argue that distance education students are attached to the individual freedom and flexibility that the self-paced model affords. Indeed, flexibility is the main reason students choose distance courses (Poellhuber, 2005).

Cooperation between students is often analyzed in terms of cooperative or collaborative learning theories, which almost always assume a group production mode in which presence, common objectives, interdependence, peer interaction, and information sharing are essential components (Slavin, 1985). But some forms of peer collaboration are much more indirect and respect a desire for flexibility. For example, at the Norwegian Knowledge Institute, where collaboration is entirely voluntary but encouraged through a sophisticated social networking environment, 55% of self-paced distance education students choose to collaborate to some degree in their courses (Shaunessy, 2007). It is in this type of learner-defined cooperation that we see the greatest potential for social networking in distance education.

Objectives

We know little about the readiness or willingness of distance students to make effective use of these new technologies. (And as an aside, further research needs to be done to determine the institutional readiness of distance education or online educational institutions' readiness as well.) Consequently, researchers from four large Canadian distance education or blended learning institutions worked together to conduct a survey designed to describe the use of and interest in social software and Web 2.0 applications by distance education students and to measure their interest in collaborating with peers.

Methodology

We created a 90-item online questionnaire integrating four scales adapted from previously validated survey instruments. Each conceptual dimension integrated in the questionnaire had been the object of a literature review and previous publication. The proposed scales and items were validated by an expert distance education panel. We also gathered sociodemographic data and information pertaining to variables linked to persistence in distance education. The following scales were integrated: Cooperative and Learning Preferences (Owens & Stratton, 1980); Tertiary Students' Readiness for Online Learning (TSROL) (Pillay, Irving, & Tones, 2007); Social Software Expertise; and Interest in the Use of Social Software for Learning, DSSES (Poellhuber, 2007). The instrument was piloted with small groups of students (20–30) in both French and English.

A systematic sampling of students was applied in each of the four participating postsecondary institutions (three francophone [Université de Montréal, Cégep@distance, and TÉLUQ] and one anglophone [Athabasca University]). Between July of 2009 and February of 2010, an email and/or a written invitation to participate in the survey were sent to all students registering in a particular period of time, differing slightly in each institution. Typically a message was sent to all those enrolling in courses over a 1–2 month period.

We also had to adapt some of the language and the formulation of some of the items to the specific context of postsecondary distance education and to language issues.

Scales

In order to measure the predisposition of distance students toward collaboration versus individual learning, we adapted the Learning Preferences Scale for students from Owens and Stratton (1980) ($\alpha=0.67$ and 0.76). In order to shorten the survey, we dropped the Competitive scale because it does not really apply to self-paced students.

Social software proficiency may very well depend upon general technical proficiency or attitudes toward technology. The literature review led us to choose the TSROL instrument (Pillay et al., 2007) because of its metric qualities, its positive correlation with other measurement instruments, and its relative shortness.

We also queried students on their perceptions of their expertise with and interest in using

11 social software tools. Respondents had to answer a question concerning their experience with these tools based on a 5-point scale (no experience, beginner, intermediate, advanced, expert) and concerning their interest in having these tools used in their programming. Having an active account (though minimally used) was considered the cut-off point for the intermediate level of expertise.

Sample Characteristics

A total of 12,384 invitations were sent with a return of 3,462 completed questionnaires. This global return rate of 28% is comparable to return rates obtained in email-delivered surveys (Sheehan, 2001). It varied from 25.3% at Cégep@distance to 47.3% at Université de Montréal.

Women constituted 75.3% of the sample, reflecting the gender disproportion of the student population of all four institutions and long associated with distance education programming (Howell, Williams, & Lindsay, 2003). Preliminary analysis showed that age is significantly related to many variables but not in a linear fashion. Table 1 shows that age was categorized in five categories of about 8-year spans, trying to match the “generations” hypothesis: 16–24 (Generation Z); 25–32 (Generation Y); 33–40 (Generation X2); 41–48 (Generation X1); 49 and over (Baby Boomers).

Table 1

Gender and Age Representation

Gender/age	<i>N</i>	Percent
Male	840	24.7
Female	2554	75.3
Total	3394	100
16–24 years old	1288	37.2
25–32 years old	941	27.2
33–40 years old	556	16.1
41–48 years old	362	10.5
49 years old and over	185	5.3
Total	3332	100

Globally, the Cégep@distance clientele is much younger than that of the three other institutions, which is not surprising because in the postsecondary system of Quebec, CÉGEP is an intermediate between secondary school and university. Université de Montréal's distance students are also younger than TÉLUQ's and Athabasca's.

Students from these four institutions also differ on some other variables. Overall, full-time

study is the principal occupation of 42.5% of the sample, with work being the principal occupation of 50.6%. But important and significant differences across institutions are also apparent, with Cégep@distance having more full-time students (71.6%) than TÉLUQ (23.9%) and Athabasca (30.9%). While 38.5% of the sample had no former experience in distance education, at Athabasca 65.2% of respondents had taken two or more distance courses previously, with 64.4% at TÉLUQ, but only 39.0% at Université de Montréal and 19.9% at Cégep@distance having past experience with distance education studies. Furthermore, among students having previously taken distance courses, more students from Cégep@distance than other institutions had previously failed at least one distance course (33.9% versus 9.7% for students of other institutions).

Quantitative Procedures

Data from the four databases was cleansed and aggregated. Only valid questionnaires (unique and not empty) were retained. This left 3,462 answers corresponding to the criteria.

Exploratory factor analysis (principal components) was applied to the first 595 answers of the French questionnaire, and Cronbach alpha was calculated for each scale and subscale. The results led us to retain 8 of the 13 items of the Cooperative ($\alpha = .81$) and Individual ($\alpha = .79$) preferences scales.

Two-way MANOVA and ANOVA tests were used on a variety of continuous measures as required conditions for this analysis being met (tested normal distribution, asymmetry, and skewness within the range accepted for normal distributions), permitting us to analyze an Age X Gender interaction effect.

For the categorical analysis, we used the Goodman-Kruskal Tau statistic and a column proportion post-hoc test. This test of association is based on a proportional reduction in error. It predicts the proportional increase of one categorical variable when knowing a second categorical variable (Cramer, 1994, p. 214).

Results

Teamwork Experience

Figure 1 shows that on the mean of a 5-point Likert Scale, 3 representing neither positive nor negative, past experience of teamwork was slightly more positive for males and for younger respondents. A two-way ANOVA yields an insignificant gender effect ($F_{(1, 3304)} = 2.28, p = .072$) ($np^2 = .001$), but a significant age effect ($F_{(4, 3304)} = 6.42, p < .001$) ($np^2 = .011$), as well as a significant interaction of age by gender effect ($F_{(4, 3304)} = 2.67, p = .005$) ($np^2 = .005$). For males, the relation between teamwork experience and age is almost linear, with

the 16–24 subgroup having the most positive teamwork experience. Figure 1 shows these effects graphically, crossing lines being characteristics of a significant interaction.

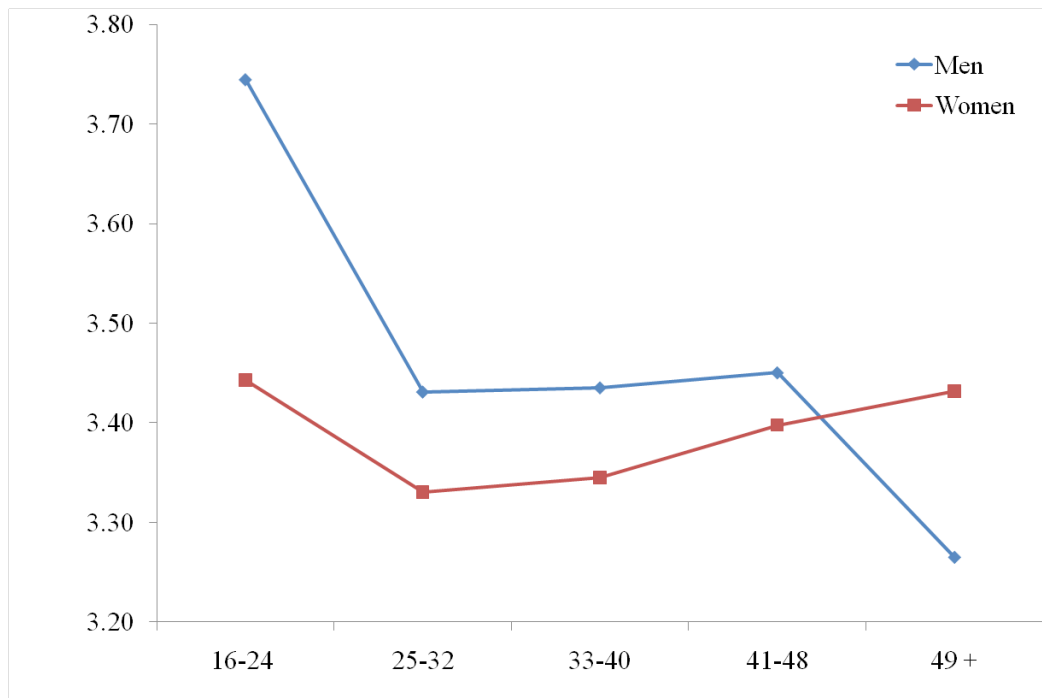


Figure 1. Mean evaluation of past experience with teamwork.

Cooperative and Individual Preferences

Cooperative preferences follow a pattern very similar to past experience with teamwork, suggesting that the two are related. This is confirmed by a correlation analysis leading to $r = .614$ ($p < .001$). Cooperative preferences are mildly but significantly higher for males than females ($F_{(1, 3313)} = 5.86$, $p < .001$; $np^2 = .005$) and higher for younger than older ($F_{(4, 3313)} = 1.18$, $p = .011$; $np^2 = .004$), the largest differences being for the youngest (16–24) age group, the age by gender interaction effect being also mild but significant ($F_{(4, 3313)} = 1.13$, $p = .014$; $np^2 = .004$). This gender effect is somewhat surprising, given both stereotypical beliefs and research evidence (Ocker, 2001) claiming that females enjoy collaborative learning opportunities more than males do. Individual preferences scored higher than cooperative preferences for every age group except the youngest (16–24). The 41–48 and over 49 groups distinguish themselves with much higher individual learning preferences.

Interest in Collaborating with Peers

Overall, 38.4% of respondents are interested or very interested in collaborating with peers in their distance courses. Here again, a two-way ANOVA leads to significant age ($F_{(4, 3253)} = 2.80$, $p = .025$; $np^2 = .025$) and gender effects ($F_{(1, 3253)} = 17.37$, $p < .001$; $np^2 = .005$), as well as an age by gender interaction effect ($F_{(4, 3253)} = 0.36$, $p = .841$; $np^2 = .000$). These results are somewhat surprising given that the age effect is in the opposite direction to what was expected for those with past experiences with educational teamwork. Older distance students are more interested than younger students in collaborating with peers even though they have less experience with collaboration (Table 1). These results are true for both men and women.

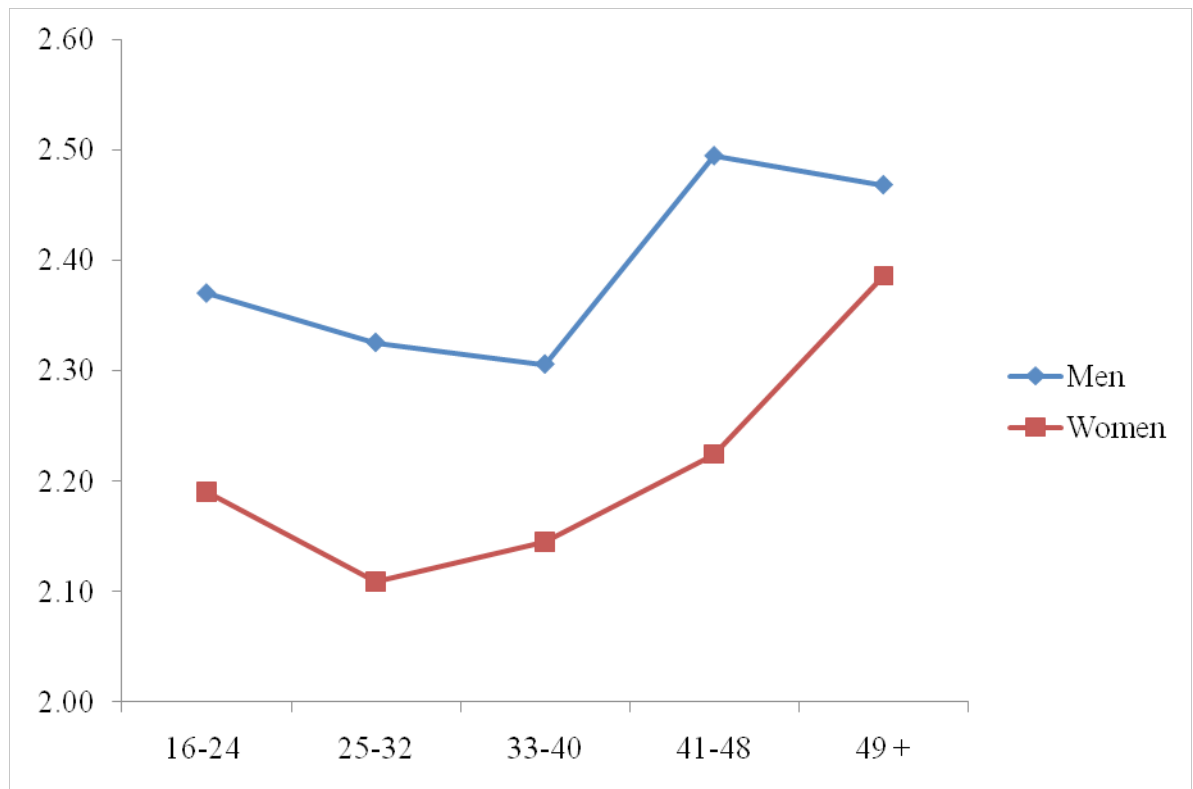


Figure 2. Mean interest in collaborating with peers in a distance course (5-point scale from 1= not at all interested to 5 = very interested).

Table 2 shows a significant and important institutional effect. Compared to other students, a larger proportion of Athabasca students are interested in collaborating with peers and a smaller proportion of students from TÉLUQ are interested in this form of collaboration. These differences across institutions hold true even when controlling for age and gender effects.

Table 2

Interest in Collaboration with Peers by Institution

	Athabasca	Cégep@ distance	TÉLUQ	Université de Montréal	Total
Not interested	46.4%	63.8%	73.2%	64.0%	61.6%
Interested	53.6%	36.2%	26.8%	36.0%	38.4%

Taug = .041 * (p < .05)

Table 3

Correlations between Items Theoretically Related

	Teamwork expe- rience	Interest in col- laboration	Cooperative preferences	Individual preferences
Teamwork experience	1			
Interest in collaboration	.37**	1		
Cooperative preferences	.61**	.47**	1	
Individual preferences	-.42**	-.47**	-.53*	1

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 3 shows that the relationship between past teamwork experience and general cooperative preferences in learning is strong ($r = .614$) and significant. While still significant, the relationship between a negative evaluation of past teamwork experience and individual learning preferences is weaker ($r = -.415$).

Tertiary Students' Readiness for Online Learning (TSROL)

Table 4 shows significant differences between men and women of all ages for all TSROL scales. While the differences in attitudes toward technology are not large, those on the technical proficiency subscale are greater. Table 4 also shows an age difference on the three scales, with the younger (16–24 and 25–32) groups reporting higher scores on all three subscales. Although not very large numerically, this difference is consistent for men and women of all age groups.

Table 4

TSROL Results for Age and Gender ANOVA

		16– 24	25– 32	33– 40	41–48	49 +	Age	Gender	Age X Gender
Attitudes toward tech- nology	Men	4.11	4.12	3.97	3.85	3.95	15.36***	21.79***	0.98
	Women	4.03	3.93	3.84	3.60	3.77			
Technical proficiency	Men	4.24	4.29	4.18	4.06	3.96	15.36***	136.03***	1.76
	Women	3.88	3.73	3.66	3.49	3.39			
Competency perception	Men	4.45	4.52	4.41	4.32	4.30	13.03***	57.00***	2.95*
	Women	4.36	4.28	4.17	4.01	3.99			

* $p < .05$ ** $p < .01$ *** $p < .001$

Social Software Expertise

Table 5 differentiates students with different levels of self-professed expertise in using various social media. This table presents the percentage of experienced users, sorted in ascending order. Notice that the social media for which distance education students' level of expertise is the highest are social networking, video sharing, photo sharing, and blogs. On the other hand, social bookmarking, 3D virtual worlds, electronic portfolios, Twitter, and web conferencing expertise remains low (with under 15% of users reaching at least the intermediate level).

Table 5

Social Software Proficiency

Proportion of intermediate, advanced and expert users	<i>n</i>	%
Social bookmarking	212	6.1%
3D virtual worlds	224	6.5%
Electronic portfolios	415	12.2%
Twitter	438	12.7%
Web conferencing	473	13.8%
Podcasts	511	14.8%
Wikis	625	18.3%
Blogs	875	25.4%
Photo sharing	1150	33.7%
Video sharing	1811	52.9%
Social networking	2380	69.5%

Table 6 synthesizes the results of a series of two-way ANOVA tests crossing the mean expertise level for a given social media with gender and age. The *F* statistic is presented along with its significance level.

Table 6

Self-Professed Expertise with Social Software by Age and Gender

		Age					Gender	Age	Age X Gender
		16–24	25–32	33–40	41–48	49 +			
Blogs	Men	2.47	2.52	2.28	1.94	1.85			
	Women	2.16	1.99	1.77	1.61	1.70	53.82***	24.91***	2.15
Wikis	Men	2.59	2.39	2.03	1.59	1.59			
	Women	1.63	1.52	1.42	1.30	1.35	137.77***	34.67***	9.01***
Social bookmarking	Men	1.50	1.63	1.47	1.34	1.12			
	Women	1.21	1.21	1.20	1.14	1.20	39.40***	5.74***	3.95**
Web conferencing	Men	1.83	1.96	2.00	1.85	1.78			
	Women	1.52	1.50	1.57	1.52	1.58	60.10***	1.04	0.98

Social networking	Men	3.71	3.45	2.98	2.44	2.08			
	Women	3.71	3.37	2.71	2.22	2.11	3.99***	132.79***	1.01
Photo sharing	Men	2.42	2.67	2.33	1.97	1.76			
	Women	2.25	2.21	2.04	1.75	1.58	19.44***	20.05***	1.08
Video sharing	Men	3.55	3.28	2.69	2.36	2.08			
	Women	3.11	2.67	2.26	1.95	1.79	55.75***	97.42***	1.02
Podcasts	Men	2.06	2.23	1.98	1.62	1.58			
	Women	1.46	1.52	1.42	1.33	1.33	105.63***	12.15***	3.17*
Twitter	Men	1.86	1.96	1.78	1.56	1.50			
	Women	1.56	1.58	1.47	1.35	1.36	32.74***	8.67***	0.71
3D virtual worlds	Men	1.65	1.66	1.35	1.34	1.30			
	Women	1.24	1.24	1.19	1.14	1.12	63.69***	11.12***	4.05**
Electronic portfolios	Men	1.97	1.81	1.56	1.45	1.20			
	Women	1.54	1.35	1.33	1.24	1.21	38.04***	24.33***	3.69**

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

Table 6 shows that there are systematic gender and age differences for nearly all social software, with men and younger respondents reporting higher levels. Men reported higher expertise levels for every social software than women did. The younger (16–24 and 25–32) groups reported higher expertise with nearly all social media except web conferencing.

Interest in Using Social Software for Learning Purposes

Table 7 presents the proportion of respondents who are interested or very interested in integrating social software into their learning experience. The list is ordered by the percentage of interested respondents. This table reveals the same tendencies as the previous one, demonstrating higher interest for using social software that is most familiar to respondents. This being said, web conferencing is the exception: 42.6% of respondents are interested in using it, whereas only 13.8% of them have any significant experience using the software.

Table 7

Interest in Using Social Software for Learning Purposes

Proportion of interested or very interested users	<i>n</i>	%
Social bookmarking	616	18.1%
Twitter	627	18.5%
3D virtual worlds	473	19.4%
Electronic portfolios	965	28.5%
Wikis	1066	31.3%
Podcasts	1143	33.7%
Photo sharing	1237	36.4%
Blogs	1368	40.2%
Web conferencing	1449	42.6%
Social networking	1797	52.8%
Video sharing	1976	58.2%

Age and Gender Effects on Experience and Interest

Table 8 presents the results of a series of two-way ANOVAs crossing interest in using social software in courses with gender and age where scores indicate more interest. It shows systematic gender differences, with men being more interested than women in the use of social software for learning purposes. This is true of every social media except social networking. Age differences are also systematically present but not always in favour of the younger groups.

Table 8

Interest in Using Social Software to Learn by Age and Gender

		Age					Age	Gender	Age X Gender
		16-24	25-32	33-40	41-48	49 +			
Blogs	Men	2.26	2.50	2.28	2.31	2.53			
	Women	2.11	2.22	2.22	2.08	2.31	5.82*	23.40*	.70
Wikis	Men	2.60	2.75	2.51	2.32	2.33			
	Women	1.96	2.01	2.04	1.87	2.03	3.36*	81.45*	1.85
Social bookmarking	Men	1.78	2.09	2.02	1.99	2.07			
	Women	1.60	1.82	1.86	1.73	2.01	10.07*	14.08*	.56
Web conferencing	Men	2.30	2.65	2.72	2.70	2.72			
	Women	2.07	2.34	2.41	2.37	2.46	15.65*	27.63*	0.26
Social networking	Men	2.69	2.55	2.43	2.25	2.40			
	Women	2.75	2.60	2.37	2.11	2.23	18.15*	1.00	.89
Photo sharing	Men	2.18	2.38	2.38	2.23	2.30			
	Women	2.17	2.21	2.22	1.09	2.16	2.08*	5.05*	.73
Video sharing	Men	2.98	2.96	2.67	2.57	2.57			
	Women	2.71	2.54	2.54	2.33	2.45	11.57*	21.74*	1.57
Podcasts	Men	2.27	2.64	2.54	2.44	2.55			
	Women	1.90	2.13	2.22	2.04	2.09	8.95*	52.37*	.59
Twitter	Men	1.80	1.93	1.91	1.95	2.05			
	Women	1.65	1.72	1.80	1.66	1.83	2.70*	15.87*	.46
3D virtual worlds	Men	1.69	1.90	1.82	1.73	2.04			
	Women	1.58	1.86	1.92	1.73	1.98	6.62*	0.09*	.55
Electronic portfolios	Men	2.04	2.26	2.22	2.20	2.03			
	Women	1.97	2.06	2.11	1.96	1.99	5.28*	5.28*	.53

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

Table 9 presents the percentage of respondents in each age group who are interested or very interested in the use of social media to learn, along with the post-hoc proportion test, which makes it easier to interpret age-group differences. This table makes it evident that for many types of social software, the oldest (49 +) age group is more interested in learning use than the younger 16–24 group and/or the 25–32 group. This is true of social bookmarking, Twitter, 3D virtual worlds, podcasts, blogs, and web conferencing. For the other social

software, differences are in favour of the younger groups, but it should be noted that among the younger groups, the proportion of those interested in learning uses of social networking and video sharing is lower than the proportion of users reporting at least an intermediate level of expertise, while for older age groups it is the reverse situation.

Table 9

Interest in Using Social Software for Learning Purposes

	16–24	25–32	33–40	41–48	49 +	tau	<i>p</i>
Social book-marking	13.3 % ^a	20.6 % ^b	21.1 % ^b	17.4 % ^{a,b}	25.0 % ^b	.01	<.001
Twitter	16.5 % ^a	18.4 % ^a	20.7 % ^a	17.7 % ^a	24.4 % ^a	.00	.06
3D virtual worlds	15.1 % ^a	21.7 % ^b	25.5 % ^b	18.8 % ^{a,b}	26.9 % ^b	.01	<.001
Electronic portfolios	26.8 % ^a	29.3 % ^a	31.2 % ^a	28.7 % ^a	24.4 % ^a	.00	.14
Wikis	33.0 % ^a	31.7 % ^{a,b}	31.8 % ^{a,b}	24.7 % ^b	28.9 % ^{a,b}	.00	.10
Podcasts	28.3 % ^a	37.1 % ^b	37.2 % ^b	35.0 % ^{a,b}	31.7 % ^{a,b}	.00	<.001
Photo sharing	35.7 % ^a	37.7 % ^a	38.1 % ^a	34.1 % ^a	33.0 % ^a	.00	.52
Blogs	36.8 % ^a	42.6 % ^a	43.8 % ^a	36.1 % ^a	44.4 % ^a	.01	<.001
Web conferencing	34.0 % ^a	45.2 % ^b	50.4 % ^b	49.2 % ^b	50.3 % ^b	.01	<.001
Social networking	61.2 % ^a	55.2 % ^b	44.4 % ^c	37.0 % ^c	41.4 % ^c	.03	<.001
Video sharing	64.0 % ^a	57.2 % ^b	56.0 % ^{b,c}	48.2 % ^c	48.9 % ^{b,c}	.01	<.001

* *p* < .05 (column proportion test); Each column pair in Table 9 is compared with a z test. If two columns differ significantly, a different superscript letter is assigned. Hence, if two columns have the same superscript letter, they do not differ from each other, and if they have different superscript letters, they differ significantly from each other at the .05 level.

It is interesting to note that while older students profess less expertise with all the social media, they express equal or higher levels of interest in using these media in their studies than younger students do. This could suggest that those with more experience do not see the value of these tools for formal learning or that they have become accustomed to and have expectations of only informal and entertainment uses. However, the interest by older students points to the potential for broad and enthusiastic adoption if institutions were to begin using these tools in their programming.

Discussion

Though not discussed in great detail in this report, the differences between men and women are important and significant, pertaining to a wide variety of indicators, specifically when it comes to attitudes about and experience with technology. Men claimed to be more experienced and to have more expertise than women did in regards to all social software, except social networking. These results hardly come as a surprise when one considers the numerous studies that reveal these differences, such as the tendency of men to demonstrate a feeling of competence and a favourable attitude toward the use of technology. For example, men consider themselves more competent in using the Internet than women do (Miller, Schweingruber, & Brandenburg, 2000), and other studies also mention that men report a higher level of self-confidence with technology (Whitley, 1997; Jackson, Ervin, Gardner, & Schmitt, 2001). These findings might be attributed to the self-report methodology as some research findings question the validity of claims regarding any actual differences between men and women concerning their expertise with technology (He & Freeman, 2009).

Surprisingly, men recorded more positive experiences with teamwork than women did, as well as higher cooperative preferences for learning. For men, teamwork experience ratings changed almost linearly with age. As age increased, teamwork experience ratings decreased. One can perhaps assume that the impact of pedagogical renewal efforts in Quebec and elsewhere over the past few years has provided the younger groups of students with an academic setting that is more focused on teamwork. Though women are traditionally perceived as being more interested in cooperation than men are, these results demonstrate that men of all ages are more interested in cooperating with peers in the context of distance education courses. This does not necessarily represent an interest in teamwork because social software allows new pedagogies (Anderson & Dron, 2011) and forms of networked collaboration and cooperation, many of which are indirect, such as tracing history and rating artifacts. These are the more popular social software applications (social networking, video sharing, photo sharing, i.e., the ones in which we find the largest proportion of experienced users).

Table 3 demonstrates that the correlation between more or less positive experiences with teamwork, interest in collaboration, cooperative preferences, and individual preferences flows in the expected direction. That being said, if the correlation between experience in teamwork and cooperative preferences is strong ($r = .614$), it is much weaker in regards to interest in collaboration in the context of distance courses ($r = .372$). For older respondents, interest in collaboration with peers in a distance course is higher than for younger respondents, in spite of less positive teamwork experience and lower cooperative preferences. Perhaps older students place higher value on opportunities for interaction at a distance than younger students do.

The Learning Preferences scale measures preferences for learning situations in general, and respondents likely associate it specifically with learning experienced in classroom contexts. It is possible that in distance education contexts, these preferences change and that certain people who generally lean toward more cooperative preferences are not necessarily inter-

ested in collaborating with their peers. In fact, this type of cooperation implies a compromise in regards to the flexibility of distance learning (increased collaboration implies loss of individual freedom necessitated by synchronizing pace and time scheduling), the flexibility of the course being the main reason for choosing this type of learning (Poellhuber, 2005). Older students seem to be more ready than younger students to compromise this flexibility. A large proportion of students (over half at Cégep@distance) are simultaneously registered in a campus program at another on-campus institution. The interest in collaboration might be explained by the fact that the students registered in distance institution programs have more desire for interaction than on-campus students who have a greater opportunity for informal contact with peers.

Interest in collaborating with peers varies strongly according to the institution from which the data was collected. Students at Athabasca are much more interested than others in collaborating with peers. These differences remain true despite age and gender controls. This suggests that there may be important cultural, institutional, or linguistic effects present. In terms of institutional characteristics, Athabasca more closely resembles TÉLUQ on a number of variables (e.g., student age, experience with distance education), and yet there are large differences in interest in collaborating with peers. These broader effects remain an interesting area for further research.

The differences in terms of expertise or attitudes toward technology are systematically significant once they are broken down according to age. The 16–24-year-old group distinguishes itself on almost every indicator. This supports the “hypothesis” about Generation Z being the so-called “Net Generation,” which is somewhat controversial in the literature (Bullen, Morgan, Belfer, & Qayyum, 2009). However, these significant differences among the 16–24-year-old group do not necessarily signify a homogeneous group, and, in our experience, there are very large differences in technological proficiency, interest, and experience within each age group.

It is worthy of note that, generally, the percentage of respondents interested in using social networking tools for learning surpasses the proportion of users experienced in the use of these tools. The list of social media, by proportional order of most experienced users, is as follows: social networking, video-sharing sites, photo-sharing sites, and blogs. Social media that users are most interested in using as learning tools are almost identical to the list of experience (video sharing, social networking, blogs). Despite the anomaly of web conferencing (very few respondents are experienced in the use of this technology [13.8%], yet most are interested), it seems that the more one is exposed to a technology, the more interest there is in seeing its use in formal courses.

Although the effect of gender was as predicted (interest in using social media is higher for men than for women), the effect of age, which is significant in almost every social medium, does not follow previously noted tendencies. In fact, in this respect, the 16–24-year-old group distinguishes itself from other age groups not by revealing an increased desire of use, but rather a decreased one. In other words, older students seem to see the pedagogical potential of social media more than younger ones do, even if the older ones are less experi-

enced in using these types of media. This is possibly explained by the fact that young people use social media for social and entertainment purposes and do not necessarily see them as tools for learning. This seems to be particularly true for social networking, which a fairly large number of experienced users are not interested in using for learning purposes. On the other hand, older students are typically the ones who have more experience in distance learning but are also the ones who are registered in the institutions' programs rather than visiting students. They seem to understand the potential that these tools offer or, at least, are more interested in using them for learning.

The sharing of bookmarks and microblogs appeared last on the list of Internet use and experience. Given the rise in popularity of Twitter over the past two years, this may not be representative of the current situation in 2011 (the data for this study having been gathered between July of 2009 and February of 2010).

Conclusion

Our findings show that a significant portion of distance students are interested in collaborating with peers, but that there is also a significant proportion of self-paced distance education students who are not. This interest in peer collaboration varies with age, gender, and institutions. Compared to women and older students, men and younger respondents claim to have more positive experiences related to teamwork as well as stronger cooperative preferences. Interest in collaborating with peers in a distance course increases with age. A similar phenomenon is observed in interest in the use of social software for learning purposes. While being less experienced than their younger colleagues, older students show more interest in learning with social software.

Strong and significant differences are observed on a variety of indicators in favour of males and younger respondents. This gives some support to the Net Generation hypothesis.

The social software in which we find the largest proportion of experienced users (and which are probably the easiest to implement and use in distance education) are the ones that require only minimal participation: video-sharing sites, photo-sharing sites, and the very common social networking sites. Web conferencing is a noteworthy exception. Even though it is one of the least-known social software applications, it is the one that students are the most interested in using to learn. Of course, the extremely rapid increase in the use of Skype web conferencing may be changing these experience and expertise levels today.

An important institutional effect has been observed regarding interest in collaborating with peers. It is not clear whether this effect is linked to the institutional culture, anglophone and francophone culture, linguistic differences, or other variables.

While the number of respondents was quite large and the return rate acceptable, the methodology used has some limits. As the survey was only presented online, there is a self-selection effect that may have excluded students with limited or no Internet access and/or with very minimal technology skills. While the sample was systematic, a history effect (an

effect linked to events external to the study during a particular timeframe) may be linked to the fact that the questionnaire distribution was confined to 4–5-week periods in 2009. This is particularly true for Cégep@distance, where the survey was conducted with summer students. Finally, it must be noted that most scales used in the questionnaire measure perceptions rather than actual performance or skill.

Future research should focus on understanding the determinants of the interest toward collaboration and/or using social software as learning tools. We also need further elaboration of models and development of interventions that allow and help interested students to collaborate directly or indirectly with peers or tutors, while preserving their individual preferences.

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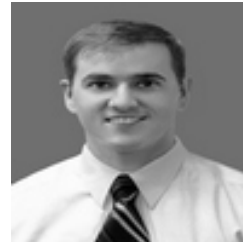
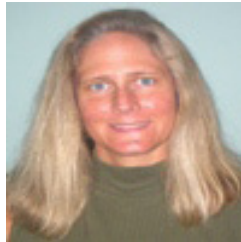
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Applying the Community of Inquiry Framework to an Online Professional Practice Doctoral Program



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Abstract

The community of inquiry (CoI) framework has commonly been used to study teaching and learning in online courses (Garrison, Anderson, & Archer 2000). This paper describes the implementation of the CoI framework in a cohort-based online EdD program, where teaching presence and cognitive presence were easier to foster than social presence. Based on the results of an initial evaluation, suggestions are made to expand the components of the CoI framework when using it at a program level. Lessons learned from the implementation are also shared to assist others wishing to apply the CoI framework to online graduate programs.

Keywords: Distance education; professional practice doctorate; higher education, community of inquiry (CoI) framework

Introduction

The College of Education at the University of Florida was engaged with colleagues participating in the Carnegie Project on the Education Doctorate (CPED), a national effort in the US aimed at strengthening the education doctorate (EdD), from 2007-2010. The EdD, sometimes referred to as a professional practice doctorate, is designed to prepare stewards of practice (Perry & Imig, 2008). That is, the degree guides students to apply research-based knowledge and to generate context-based knowledge to improve and advance practice (Shulman, Golde, Conklin, Bueschel, & Garabedian, 2006).

As a result of our institution's participation in CPED, we designed an EdD in curriculum and instruction with a focus on educational technology. The professional practice program combines the professional practice vision (Shulman et al., 2006) with a cohort-based format that includes online coursework and interactions with a one-week session on campus

each year. Our program design was guided by the community of inquiry (CoI) framework (Garrison et al., 2000), a structure highlighting the importance of teaching presence, social presence, and cognitive presence in online teaching and learning. This article describes the implementation and evaluation of the first year of the cohort-based EdD program in the context of this model. The description of implementation and research, and the ways in which this model applies to online teaching and learning, could be useful to other institutions engaged in online graduate programs.

Applying CoI to an Online EdD in Educational Technology

The community of inquiry (CoI) proposed by Garrison et al. (2000) is a theoretical framework that has been used to study online teaching and learning during the past decade. The EdD program was conceptualized as a community of inquiry where students advance through a structured program as a cohort. They have common goals, purposefully interact with and support one another, and are intensively supported by faculty members in order to complete the program. In this section we review the three main components of the CoI framework (i.e., teaching presence, social presence, and cognitive presence) and use it as a lens to examine the program.

Teaching Presence

Teaching presence, defined as “the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes,” (Anderson, Rourke, Garrison, & Archer, 2001, p. 5) is crucial for student learning, for student satisfaction, and for the creation of a community of inquiry according to several researchers (Arbaugh & Hwang, 2006; Blignaut & Trollip, 2003; Garrison & Cleveland-Innes, 2005; Kanuka, Rourke, & Laflamme, 2007; Lim & Barnes, 2002; Meyer, 2003; Murphy, 2004; Shea, Fredericksen, Pickett, & Pelz, 2003; Shea, Pickett, & Pelz, 2004; Swan, 2003; Wu & Hiltz, 2004). In the absence of face-to-face interactions, an instructor’s ability to design, plan, structure, and organize an online course becomes extremely important (Swan, 2003; 2004). In addition to instructional design and organization, Anderson et al. (2001) identified two other components of teaching presence, namely building understanding and direct instruction. These include the facilitation of student participation and the management of discourse to increase learner knowledge and critical thinking; the provision of effective, explanatory, and immediate feedback; and the leadership of the instructor, who imparts knowledge as a subject matter expert (SME).

Social Presence

Some researchers have found student trust, reliance, and sense of belonging (also called sense of community) are high indicators of perceived learning and satisfaction in online courses (Benbunan-Fich, Hiltz, & Harasim, 2005; Rovai, 2002). Sense of community, or social presence, is considered a prerequisite for achieving a deeper level of intellectual discourse. In the community of inquiry, social presence in online environments has been defined as the way that learners portray themselves as “real people” in their online interactions in the absence of face-to-face communication (Garrison et al., 2000, p. 89). Many researchers have studied social presence, often by examining asynchronous online discus-

sions in online courses, and have found that it influences learning outcomes and students' cognitive presence (Arbaugh, 2005; Celani & Collins, 2005; Gunawardena & Zittle, 1997; Hughes, Ventura, & Dando, 2007; Molinari, 2004; Richardson & Swan, 2003; Swan & Shih, 2005). In her study of social presence online, Swan (2003) reported that there was an increase in group cohesion and purposeful communication in online discussions after the class established social relationships.

Cognitive Presence

The extent to which students can construct and apply meaning using sustained reflection and discourse has been termed cognitive presence by Garrison, Anderson, and Archer (2001). Cognitive presence is developed in four stages: the identification of a problem, the exploration of the problem individually and collectively through discourse, the integration or construction of meaning through exploration, and the resolution or application of meaning to new contexts (Garrison, 2003). Cognitive presence depends greatly on the instructor, the instructional design of online activities, course structure, leadership, and the questions created by the instructor (Arnold & Ducate, 2006; Celentin, 2007; Garrison et al., 2001; Garrison & Cleveland-Innes, 2005; Luebeck & Bice, 2005; Meyer, 2003; 2004). Social presence, or sense of community, has also been found to influence cognitive presence and learner outcomes in an online course (Rovai, 2002).

Program Design

As described in the CoI, all instructors in the first year of the online EdD program adopted the roles of instructional designer, administrator, subject matter expert, facilitator, and teacher. All the faculty members had prior online teaching experience, instructional design experience, and experience mentoring graduate students. We deliberately structured the program to be more than a sequence of courses that students completed as a cohort. Several other experiences and activities were designed to enculturate students into the educational technology field, to familiarize them with the expectations and rigors of doctoral study, and to expose them to research and professional organizations in the discipline. We intended these elements of the online program to ensure teaching presence and facilitate cognitive and social presence in the EdD cohort. Table 1 provides a summary of the key features of the program and how they relate to the CoI framework.

Table 1

Key Program Features Mapped to CoI Components

	Teaching presence	Social presence	Cognitive presence
Online courses	X	X	X
Campus experiences	X	X	X
Inquiry groups		X	X
Synchronous sessions	X	X	X
Asynchronous experiences	X	X	X

Online courses.

We designed online courses in the program to include multiple forms of synchronous and asynchronous interaction (Moore & Anderson, 2003), frequent opportunities for reflection (Ainsworth & Loizou, 2003), support for a variety of learning styles via distributed practice with concepts and skills (Cepeda, Pashler, Vul, Wixted, & Rohrer, 2006), multimedia resources (Moreno & Valdez, 2005), and multiple assessment formats (McTighe & O'Connor, 2005). We used Moodle, an open source learning management system (LMS), to host all the online courses. Students completed four required online courses as a cohort in the fall and spring semesters of the first year. The purpose of these courses was to orient students to research and doctoral study in educational technology and to foster critical thinking, or cognitive presence. All projects were specific to students' professional context and allowed flexibility within certain parameters. Faculty who taught EdD courses discussed the design and content of the courses to ensure consistency across the program.

Summer campus experience.

At the end of their first year, students took a summer seminar that consisted of online activities to prepare for the one-week campus-based experience and follow-up online assignments. Program faculty collaboratively led the campus experience, which was intended to help students get acquainted with the university through interactions with one another, faculty both in and outside the program, administrators, and librarians. The first on-campus seminar served to cement the social presence that had developed online, model the teaching presence in a synchronous setting, and support cognitive presence by reinforcing the memory of content learned in the first year.

Inquiry groups.

In their first semester of the program, we grouped students according to their area of specialization to work together and support one another online. We intended the inquiry groups of five or six students with common contexts and interests to support social pres-

ence and cognitive presence within the larger online community of practice.

Synchronous sessions (Elluminate).

There were monthly real-time conferencing sessions using Elluminate software throughout the first year of the program to maintain communication and continuity outside of courses. The synchronous session topics were faculty- or student-driven and ranged from program questions or student concerns to information sharing about conferences and professional events. Faculty encouraged and modeled a critical approach to educational technology research and events during the sessions that supported all three areas of the CoI framework.

Asynchronous experiences (Google group).

In order to encourage students to communicate with one another outside of coursework, we integrated several asynchronous opportunities into the program design. We formed a Google group to facilitate social and cognitive presence outside of the cohort's coursework. It served as a repository for resources, a forum for program discussions, and a virtual space where the cohort could interact outside of their courses. Faculty members were "present" and active in the group.

Evaluation Methodology

Since the program was designed using the CoI framework, we reviewed instruments used to measure teaching presence, social presence, and cognitive presence (Arbaugh et al., 2008; Arbaugh & Benbunan-Fich, 2003; Garrison et al., 2001; Rourke, Anderson, Garrison, & Archer, 2001; Shea et al., 2003). However, all the instruments in the literature were for online *courses*, with some specifically for the analysis of asynchronous interactions in online courses. They were not representative of teaching and learning in an online *program*. Therefore, we could not use the existing instruments to measure these constructs in this program, and we were unable to find one single course that was representative of the entire program. In the absence of previous program-level research related to the CoI framework, we created a survey to study student perceptions of program implementation and components that corresponded to teaching presence, social presence, and cognitive presence as they had been implemented in the EdD program. The survey consisted of three sections: Faculty Instruction and Feedback; Support, Learning Environments, and Community-Building; and Application of Learning, respectively.

Faculty Instruction and Feedback

This section included items about student satisfaction with the ways that faculty structured learning and provided feedback. We adapted two items from the teaching presence scale for the program context (Arbaugh & Hwang, 2006). For example, item P2, "The instructor clearly communicated important course goals" (Arbaugh & Hwang, 2006, p. 14) was reworded as "The goals and expectations for Year 1 were clear to me" because no one instructor communicated the program goals for the EdD program. Likewise, item P5 was originally

“The instructor helped me take advantage of the online environment to assist my learning” (Arbaugh & Hwang, 2006, p. 14), and we reworded it to “The faculty helped me take advantage of the online environment to assist my learning.” The reliability (Cronbach’s alpha) for this section of the survey was 0.90 (Table 2).

Support, Learning Environments, and Community-Building

The communication medium used in an online course can influence student satisfaction and perceptions of social presence (So & Brush, 2007) and is foundational to interactions and the development of social presence. The section on Support, Learning Environments, and Community-Building thus included items on learner satisfaction with technical, library, and administrative support and with the learning environments that were used for communication and interaction in the program. A third set in this section contained questions about students’ perceived value of the asynchronous and synchronous interactions for building community (or social presence) in the cohort. The overall reliability (Cronbach’s alpha) for this section of the survey was estimated at 0.76 (Table 2).

Table 2

Internal Consistency/Reliability of the Survey

Section on the survey	Cronbach’s alpha
Faculty instruction and feedback	0.90
Support, learning environments, and community-building	0.76
Application of learning to practice	0.96
Total Survey	0.88

Application of Learning

Cognitive presence in the research has usually been measured by analyzing online discussions (Garrison, 2003), and researchers have recently included items pertaining to cognitive presence in the CoI instrument developed by Arbaugh et al. (2008). Cognitive presence in the EdD program involved the collective construction of knowledge through discourse among participants in various asynchronous and synchronous learning environments, but the main goal was the sharing and application of that knowledge in their professional practice. We thus focused the questions in this section on application of learning. Based on two cognitive presence items from the CoI instrument for a specific course, “(33.) I have developed solutions to course problems that can be applied in practice,” and “(34.) I can apply the knowledge created in this course to my work or other non-class related activities” (Arbaugh et al., 2008, p.135), we created program-specific items. For instance, “I have applied knowledge or skills gained from Year 1 of the EdD program to my practice/work environment,” or “I have shared knowledge or skills gained during Year 1 of the EdD program with my peers or colleagues outside the doctoral program” are two examples. Reliability of this section was quite high, with the Cronbach’s alpha at 0.96 (Table 2).

The reliability estimate for the survey, including all three sections, was 0.88 (Table 2). We included open-ended questions about the strengths of the program, the challenges students faced, and a request for suggestions to improve Year 1 for the next cohort.

In October 2009 we sent an email to the 26 students (28% male, 72% female) enrolled in the second year of the EdD program, inviting them to complete a survey about their first year experiences. The online survey was hosted by SurveyMonkey, and students completed it anonymously; no identifying data were collected and no IP addresses were tracked. Data collected from 16 students (61%) were imported into SPSS and analyzed. Open-ended responses were imported into NVivo software and coded.

Findings

The results from student surveys are organized in Table 3 according to the areas in the survey: Faculty Instruction and Feedback (teaching presence); Support, Learning Environments, and Community-building (social presence); and Application of Student Learning (cognitive presence).

Table 3

Survey Results (N = 16)

Faculty Instruction and Feedback

<i>(5 = Strongly Agree; 1 = Strongly Disagree)</i>	<i>Mean</i>	<i>SD</i>
The goals and expectations for Year 1 were clear to me.	3.87	.806
My expectations were met during Year 1.	4.37	.619
I learned a lot from the faculty.	4.56	.629
I learned a lot from my peers in the EdD cohort.	3.81	.834
The faculty helped me take advantage of the online environment in a way that assisted my learning.	4.44	.727
I am satisfied with the timeliness of feedback provided to me during Year 1.	4.12	.957
I am satisfied with the quality of feedback provided to me during Year 1.	3.94	1.124
I am satisfied with the support provided to me by the faculty during Year 1.	4.56	.629

Support, Learning Environments, and Community-Building

	<i>Mean</i>	<i>SD</i>
Online Support		
<i>(5 = Strongly Agree; 1 = Strongly Disagree)</i>		
I am satisfied with the technical support provided to me during Year 1.	4.13	1.088
I am satisfied with the administrative support provided to me during Year 1 (e.g., registration).	4.19	1.276
I am satisfied with the instruction and support provided to me for accessing library resources.	4.38	1.088
Satisfaction with learning environments		
<i>(5 = very satisfied; 1 = very dissatisfied)</i>		
Moodle for courses	4.56	.727
Google Groups for work outside of courses	3.00	.966
Elluminate for synchronous sessions	4.06	.854
Value of the following for building community in the cohort		
<i>(5 = very valuable; 1 = not valuable)</i>		
Google Groups	2.56	1.094
Discussion forums	3.81	1.047
Elluminate	3.81	1.047
Inquiry groups	3.53	1.060
Summer campus session	4.88	.342

Application of Learning

<i>5 = Strongly Agree; 1 = Strongly Disagree)</i>	<i>Mean</i>	<i>SD</i>
I have applied knowledge or skills gained from Year 1 of the EdD program to my practice/work environment.	4.33	1.113
I have shared knowledge or skills gained during Year 1 of the EdD program with my peers or colleagues outside the doctoral program.	4.31	1.078

Following my participation in Year 1 of the EdD program, I have changed how I approach my work responsibilities.	3.62	1.204
Following my participation in Year 1 of the EdD program, I have a better understanding of my role as an educational practitioner.	4.06	1.063
Year 1 of the EdD program has been relevant to my professional goals.	4.19	1.047
Year 1 of the EdD program has contributed to my professional growth.	4.31	1.078

Faculty Instruction and Feedback

In response to questions about their expectations, satisfaction, and sense of faculty support during the EdD program, 94% of students agreed or strongly agreed that their expectations were met during Year 1 of the program. They were also largely satisfied with the timeliness and quality of feedback provided and learned a great deal from the faculty in the program. When asked in open-ended survey items to comment on the strengths of the program, 67% of students cited the faculty members and their support as the main strength. One student wrote, “The faculty are all wonderful to work with, have a great depth of knowledge, create learning experiences that connect with authentic, real-world information, and are excellent at keeping contact individually.”

Support, Learning Environments, and Community-Building

Over 75% of students either agreed or strongly agreed that they were satisfied with the technical and administrative support provided to them in Year 1. In addition to a traditional learning management system for online courses, the program also integrates other asynchronous and synchronous environments, as described earlier. Over 86% of students were very satisfied or satisfied with the learning management system, Moodle, and with Elluminate, the software used for synchronous sessions. Only 25% were satisfied with the use of Google Groups for non-course asynchronous experiences. Students reported that there had been inadequate peer interaction outside of the required coursework during the first year of the program. In the optional comments area, several students cited lacking a coordinated time to meet or collaborate online as an obstacle. As one student noted,

I have terrific peers in the cohort, but we are all so busy. A highlight of the summer session was meeting my cohort members, and I really thought the personal interactions would continue, but we haven’t really had any reason to partner with each other.

Of the key program features described earlier, the campus-based seminar experience in the summer was rated by students as the most valuable for building community in the cohort. Students suggested that a summer face-to-face meeting at the beginning of the first year of

the program be included for future cohorts.

Student Learning and Application of Learning to their Practice

Corresponding to the EdD program goals of facilitating problem-solving and technology integration in students' professional practice, students reported the integration of real-life, authentic projects related to their career objectives as a strength of the program. At least 81% of students reported that they have applied the knowledge or skills gained from the first year of the EdD program to their practice, have shared new knowledge with peers or colleagues in their professional environment, and have a better understanding of their roles as educators. Eighty-eight percent agreed or strongly agreed that the program has contributed to their professional growth.

Discussion and Significance for Online Programs

The research reported in this paper was conducted in a cohort-based professional practice doctoral program in educational technology and cannot be generalized to all online programs at all levels of higher education. However, the results point to the usefulness of the CoI framework in conceptualizing and implementing online programs. This section provides suggestions and considerations for the building of a community of inquiry (CoI) in professional practice or doctoral online programs that could be useful to others involved in developing, implementing, and evaluating online programs.

Students cited faculty presence, feedback, and support as a strength of the EdD program. Faculty expertise in online teaching and learning, instructional design, course structure and organization transferred to program design, structure, and organization. A structured course sequence; consistent communication between students and faculty within courses and about program-level issues; the development of respectful relationships based on subject matter expertise, trust, and mentoring; and instruction that promotes students' efforts to apply their knowledge to further their professional goals are all key elements of teaching presence at the program level. Similar to Shea, Hayes, and Vickers' (2010) conclusion that the construct of teaching presence in the CoI framework can include instructor communication and organization in all aspects of an online course, our experiences indicate that additional skills are needed to foster teaching presence in an online program. Faculty not only need excellent online pedagogical skills, organizational skills, and experience with online courses but also have to understand administrative procedures and collaborate with multiple entities in their institution to ensure different types of support (e.g., administrative support, library resources, and research skills) that students at a distance might require in an online program are readily available. Others wishing to develop similar programs must consider these factors and ensure that at least one faculty member in the program has the institutional knowledge necessary to bring together cohesive and multifaceted support.

Evaluation data suggest mixed student satisfaction with social presence in the program. Students reported high satisfaction with asynchronous communication in courses and with synchronous communication during Elluminate sessions and the campus-based experi-

ence. High student satisfaction in these areas is not surprising, given the faculty members' expertise with online courses and students' familiarity with the learning management system (Moodle) and communication tools used in the program. Further, social presence is easier to facilitate in online course discussions or synchronous sessions where students' participation is mandated. In the EdD program, social presence was more difficult to foster in environments (e.g., the Google group, Inquiry groups) that had been envisioned as unstructured avenues for increased community-building via student interaction and initiative. Students were less satisfied with interactions in these areas. The environments relied heavily on individual student motivation and self-direction (Moore & Anderson, 2003), areas that are now being highlighted, scaffolded, and directly addressed in activities for both the old and new cohort in the EdD program.

In retrospect, the life cycle of the online community and the importance of faculty leadership during the inception stage (Iriberry & Leroy, 2009) should have been more carefully considered to foster social presence. In the second cohort, we plan to implement structured and required asynchronous and synchronous interactions in a virtual program space. Faculty members hope to gradually transfer responsibility for interaction to students and will require them to facilitate conversations on topics of interest. We have also introduced a campus-based session to build community and social presence at the beginning of the program for the second cohort. Others wishing to develop similar programs should carefully conceive strategies to facilitate social presence, consider the life cycle of an online community (Iriberry & Leroy, 2009), and not take student motivation or participation in a given environment for granted.

Cognitive presence in the EdD program took the form of (a) problem definition, exploration, and learning through discourse in multiple asynchronous and synchronous settings; and (b) the regular application of knowledge and skills from the program to students' practice. Traditionally, the former has been studied by conducting a content analysis of online discussions or a survey about learning resulting from interactions at the course level (Garrison, 2003; Arbaugh et al., 2008). However, in our doctoral program, we structured opportunities for students not only to interact with each other in various learning environments but also with peers outside of their program, other professional organizations, and leaders in their professional practice. Such opportunities are crucial for doctoral students, and measures to assess the effectiveness of learning not only through interactions with their cohort but also through interactions during program activities involving non-cohort members have to be developed.

Among other things, students reported applying knowledge and skills learned to their work and sharing the acquired knowledge with others. This parallels the philosophy of professional practice doctoral degrees, which require students to use research and literature in systematic and intentional ways to inform, improve, and solve educational problems in their local contexts (Shulman et al., 2006). The integration of university-based learning and professional practice is expected to lead to the development of important habits of mind that include intentionality, metacognition, critical-mindedness, creativity, clarity of expression in oral and written communication, and a positive stance toward continuous

learning and professionalism (Costa & Kallick, 2008). Beyond course experiences, we expect students in the EdD program to develop these habits of mind by consistently engaging within the scholarly community in different ways. Thus we have included explicit activities that develop such habits via course and non-course experiences in the EdD program for the next cohort, and these should be considered by others who wish to develop cognitive presence beyond course topics in a program.

Significance for Research in Online Programs

The content analysis of online discussions and survey instruments have been the main methods used to assess teaching, social, and cognitive presence in online courses. In order to consistently assess teaching, social, and cognitive presence at a program level, the existing instruments should be expanded to consider the areas discussed in this paper. Existing indicators of cognitive, teaching, or social presence have to be adapted to analyze both asynchronous and synchronous interactions and course-specific and non-course-specific interactions in different learning spaces. There are challenges and choices associated with deciding which asynchronous or synchronous interactions should be analyzed across courses or virtual spaces in a program, for instance, with choosing random interactions in various program courses and from the virtual spaces where students communicate outside of courses in a program. The increase in the use of social media in online programs for professional networking and in professional organization activities, along with students' informal use of such virtual spaces to supplement their formal learning experiences, poses further complications in measuring how a community of inquiry develops within a cohort or students in an online program.

The CoI instrument developed by Arbaugh et al. (2008) is useful for studying the CoI framework in online courses, and we are reviewing it for use with the next cohort in the EdD program in educational technology. While it is possible to implement this instrument in multiple courses in a program, the results would not accurately reflect the interactions, mentoring, instructional design, administration, and support that contribute to the building of a community of inquiry at a program level. It is important to expand this instrument or else develop others for programs that encompass asynchronous as well as synchronous interactions, course-specific and non-course-specific activities in various virtual spaces, the involvement of multiple and diverse faculty members, and different types of learning objectives, including the application of knowledge and learning to practice.

Conclusions

Given the increase in the number of online programs in recent years (Allen & Seaman, 2010), it is reasonable to assume there will be a subsequent increase in online degrees. Thus, there will be an associated need to develop protocols to investigate such programs. Based on the findings of this study, we suggest that the CoI framework of teaching, social, and cognitive presence is a useful lens through which to study online teaching and learning in professional practice programs. The CoI framework is commonly used to examine online courses, and our results suggest it can also be used in online programs, with an expand-

ed role for each of the three primary areas of the framework. Teaching presence included program level design, implementation, organization, and responsibilities of faculty. Social presence included interactions outside of courses and the building of community using different types of interactions (synchronous and asynchronous) over a period of time. Cognitive presence included the development of habits of mind through course and non-course experiences. Further, in the context of online doctoral study, social and cognitive presences are also developed through interactions in professional organizations and with professionals outside of a doctoral program. Others wishing to develop similar programs will want to explicitly consider these areas as well as the use of the CoI framework in the design, implementation, and evaluation of their programs.

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Applying Constructionist Principles to Online Teacher Professional Development



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Abstract

This report explores the first iteration of a teacher professional development courselet grounded in constructionist theory and activities. This online teacher professional development (oTPD) courselet provided opportunities for teachers to engage in just-in-time, ongoing TPD within a social networking site for educators. The topic of the oTPD was Robotics and Hands-on Activities in the Classroom. The courselet was designed for teachers who are interested in integrating constructionist pedagogies into their practice. Key findings of the first delivery of the oTPD courselet point to a need for flexible access, sharing of resources, and support for constructionist pedagogical activities as a PD value for participants. Findings further support the potential for an ongoing online community of practice around robotics in the classroom. The approach taken in this oTPD courselet of study continues to inform a model of oTPD delivery within a social-networking-enabled environment.

Keywords: Constructionist; robotics; oTPD; teacher professional development; courselet

Introduction

Tell me, and I will forget.
Show me, and I may remember.
Involve me, and I will understand.
Confucius, circa 450 B.C.

As the Information Age continues to evolve, digital media literacy continues to rise in importance as a key skill in almost every profession (Johnson, Levine, Smith, & Stone, 2010). Social media technologies are becoming pervasive in work environments, and knowledge of their affordances, applications, and uses is becoming increasingly important. In classrooms, new media technologies underscore every part of students' lives as tools for social networking, online collaboration, and media sharing are all rapidly maturing and becoming integrated in education and recreation activities (Hovorka & Rees, 2009).

Educators are charged with the task of creating learning activities that integrate these new technologies, although few have any formal training in digital and social media (Whitehouse, Reynolds, & Caperton, 2009). This problem is further compounded by the fact that new information technologies and processes are emerging faster than they can be integrated into course material and textbooks, so even newly graduated teachers are often sorely behind in their knowledge of the technologies of which they are expected to be skilled practitioners. As a result, teacher professional development (TPD) that focuses on the integration of these new technologies into teaching practice is critically needed. Additionally, access to timely, ongoing, and relevant TPD opportunities to meet these kinds of needs is a persistent challenge. Online teacher professional development (oTPD) has the potential of fulfilling these needs in current educational situations (Dede, Ketelhut, Whitehouse, Breit, & McCloskey, 2009; Herrington, Herrington, Hoban, & Reid, 2009; Vrasidas & Glass, 2004). The literature has identified a critical need for research into accessible and high-quality oTPD implementations (Dede et al., 2009; Sprague, 2006). Despite the potential of oTPD, however, little research is being conducted to explore its implementation and effectiveness (Borko, Whitcomb, & Liston, 2009; Whitehouse, Breit, McCloskey, Ketelhut, & Dede, 2006). The use of oTPD and Web 2.0 technologies, which require a demand–pull rather than a supply–push teaching and learning approach (Whitehouse et al., 2009), may in fact meet constructionist online learning challenges and needs.

Desimone (2009) reports a recent consensus on the critical features of TPD that lead to increased knowledge and skills and to improved practice. These features include content focus, active learning, coherence, duration, and collective participation. Of these features, content focus and how students learn that content were considered the most influential for teacher professional development success. The oTPD implementation described in this paper encompassed all these essential features.

The research reported in this paper is part of an ongoing design-based research (DBR) program centered on the development, design, and evaluation of *courselets*. A courselet is a module of oTPD delivery using content-focused instructional packages and the creation of learning artifacts to demonstrate learning, delivered within a social networking site (Ostashewski, 2010; Ostashewski & Reid, 2010). Online social networking is a new way for teachers to access PD, and courselets have the potential to provide asynchronous, synchronous, or blended learning opportunities that are inexpensive and scalable and provide new types of TPD learning opportunities (Whitehouse, 2010). This research into oTPD seeks new ways to meet teachers' learning needs, to identify opportunities for developing online communities to support learning (Oliver & Brook, 2002), and to extend the knowledge of

the field of oTPD in order to create effective models for PD in the 21st-century.

The advantages of utilizing an online social networking framework as a delivery platform for oTPD are threefold. First, the online delivery platform supports and encourages teachers to learn together, while allowing them to retain control over their time, space, presence, activity level, identity, and relationships (Anderson, 2006). Increasingly, demands on teachers' time and teachers' lack of control over their PD activities result in one-time PD workshop sessions that are well documented to have little transfer to classroom practice (Borko, 2004). However, the delivery of PD through online social networking allows teachers to control their access and participation in relevant activities.

Second, it promotes the development of a network of relationships, which teachers can access to support their classroom teaching practices beyond their more formal oTPD activities. This is an expansion of a more traditional network that can exist within a school or school district. This online network of teachers does not need a bricks-and-mortar connection; it uses relevant online tools for communication and connection.

Third, the delivery of professional development via a social networking site provides teachers with firsthand experiential learning about online technologies, using tools such as blogs, forums, and video and file sharing. The opportunity to actively engage with these online tools for the purpose of creating online resources and artifacts and then sharing them with other teachers to support their learning (an example of constructionist pedagogy in practice) provides teachers with an authentic experience of how online technologies can be used in their own classrooms.

The Study

This paper reports on a single iteration of an ongoing DBR study focusing on the development and delivery of oTPD within a social networking site. DBR is a constructive activity that allows researchers to produce and add to the foundation of educational technology theory and may contribute more than other types of research to this field (Wang & Hanafin, 2003). An understanding of the outcomes of design-based research can be found by exploring a key component of the methodology. This key component is an iterative development–delivery–evaluation–redesign cycle. The cycle is the process by which DBR is able to broadly explore the nature of a learning innovation and the complex system in which it occurs. A design-based research program goes beyond perfecting a specific product or artifact to generate a model of a successful innovation supported by design and implementation principles (Design-based Research Collective, 2003).

In this research study, the constructive activity of building the environment, structure, and processes needed to deliver oTPD is grounded by both the literature and the ongoing evaluations that occur as part of the development and delivery activities. DBR blends empirical educational research with theory-driven design of educational environments and is an important research methodology for detailing when, why, and how innovative educational solutions work in practice (Design-based Research Collective, 2003). It is this type of research

process that we believe will help educators to understand the relationships among theory, designed innovations, and practice.

The Context

In 2009, an online educator community, www.2Learn2Gether.ca (2Learn.ca Education Society, n.d.), was established by the 2Learn.ca Education Society in order to provide support for Alberta educators in the form of a collaborative online environment. The community was based on social networking software customized to provide members with tools commonly found in social media sites like Facebook and Ning or learner management systems like Moodle. Participant interactions in the online community involved user-created groups and forums, personal and group blogs, event calendars, and member messages. Learning opportunities included participation in activities to support in-class events, access to professional development videos, file uploading and sharing, and oTPD courselets. The latter were similar to traditional online courses, but the social networking tools inherent in the environment were used throughout the structured educational offering. Courselets were designed to involve 10–15 hours over 6–8 weeks of learner engagement with the material and interactions with other participants and the facilitators. This amount of learner engagement differs remarkably from the 39 hours over 12–13 weeks required in a university course and 6–8 hours in a typical single-event, face-to-face teacher professional development session.

A particular courselet titled “Robotics and Hands-on Activities in the Classroom” was intended to provide teachers with an exemplar in two distinct forms: as a group of learning activities demonstrating constructionist pedagogy in action (i.e., the instructional design of the courselet was based on constructionism) and through the instructional materials themselves. The courselet materials presented LEGO robotics activities structured for a constructionist environment, including the presentation of the content, the building of robots, and the manner of classroom implementation. In other words, not only did the participating teachers experience the constructionist approach, but they also learned about constructionist pedagogy and how to incorporate it into their own classroom teaching practices. This result is in line with the findings of several studies (Alimisis, 2008; Alimisis et al., 2007; Bers, Ponte, Juelich, Viera, & Schenker, 2002; Stager, 2009), which showed that engaging teachers in robotics training activities resulted in the integration of computer-based robotics into the classroom and the transformation of classroom environments toward constructivist learning. The activities in this Robotics courselet engaged teachers with the constructionist literature and encouraged them to discuss and evaluate content-focused online resources, as well as to participate in constructionist activities by sharing their reflections on the challenges of applying a constructionist approach in the classroom. The final courselet product was an online lesson plan utilizing the discussions and constructions of these TPD activities. Seen through the lens of constructionist theory and emerging models of instructional design, the Robotics courselet provided an opportunity for participants to experience and reflect on a new strategy to add to their “instructional toolkit” or teaching repertoire. Within the constructionist paradigm of the Robotics courselet, participants formed new relationships with knowledge, something that Kafai and Resnick (1996) argue

is as important as forming new representations of knowledge.

The theoretical framework and literature that informed the design of the Robotics courselet activities and content is based on Seymour Papert's (1999) constructionism learning theory. Hands-on learning, learning by doing, and learning through constructive play or gaming are some descriptions of the application of constructionism and provide insight into the use of this teaching and learning theory. In this setting, the application of constructionist learning theory is represented through the act of constructing an artifact as this is a significant step in the knowledge representation process. These acts of construction can be virtual actions, such as the manipulation of software, or real actions, such as the physical manipulations needed in order to create an artifact. The creation of this artifact, or product, allows the learner to develop a deeper understanding of the concept being studied. Papert's theory of constructionism arose from learning associated with digital media and computer-based technologies and is more pragmatic and situated than Piaget's theory of constructivism.

According to constructionist theory, tools, digital media, artifact construction, and reflective discourse on the artifact are the basis of new knowledge construction. Similarly, the social media web provides a framework where learners are equipped with a constantly expanding array of online digital tools, allowing them to construct and share their digital artifacts instantly with others around the world, a feat that Papert and others probably considered impossible 30 years ago.

A distinct set of characteristics of effective teacher professional development (Desimone, 2009; Schwille et al., 2007) was used in the development of the courselet. Schwille et al. (2007) identify two key dimensions of effective TPD: core features and core structures. The core features focus on content, active learning, and coherence. The core structures are duration, form, and participation. Desimone (2009) affirmed that recent research reflects a consensus about some of the characteristics critical to effective TPD that increases student achievement: content focus, active learning, coherence, duration, and collective participation. The development of the courselet ensured that these characteristics were present in its oTPD implementation.

One of the challenges of oTPD is to provide active learning opportunities tied to curricular goals that engage learners in student–student interactions. Online active learning can take the form of wikis, video productions, or collaborative projects. Engaging online learners in the construction of a reflective blog within the social setting of the World Wide Web is a constructivist learning activity. However, immersing students in RSS and blogging experiences as a component of online learning extends their levels of involvement and reflection as the act of *publishing* about their thinking “ups the ante” and results in a constructionist learning activity (Toledo, 2007). Additionally, constructionist online activities provide the ability to scaffold learning, a constant challenge for accommodating the diverse capabilities of online and distance learners. In summary, constructionism has the potential to elicit meaningful active learning artifacts to support and meet the needs of networked connectionist distance education (Papert, 1992; Siemens, 2005).

Teacher professional development activities with constructionist design principles have the potential to be highly effective, providing teachers with an exemplar of constructionist activities to allow them guidance and support in the construction of meaningful, applicable teaching artifacts. The literature review found 10 studies that met this criterion: Alimisis, 2008; Alimisis et al., 2007; Bers et al., 2002; Chambers & Carbonaro, 2003; Helps, 2007; Koehler & Mishra, 2005a; Koehler & Mishra, 2005b; Richards, 2009; Stager, 2009; and Whitehouse et al., 2009. These studies support the approach of engaging teachers in the design of a technology implementation plan or lesson plan in order to increase their understanding and confidence with constructivist learning. Programs such as these assist teachers in designing effective technology activities for their classroom. The goal of the teacher professional development reported in this paper is ultimately for students to be engaged in constructionist activities through their teachers' authentic engagement in and construction of new knowledge.

Courselets

The implementation of constructionist principles in teacher professional development is part of an ongoing design-based program of research centered on the development, design, and evaluation of courselets. This courselet involved 10–15 hours of teacher interaction and was delivered via a Web site (Ostashewski, 2010; Ostashewski & Reid, 2010). The courselet structure provided learning opportunities that are based on constructionist principles and that are inexpensive and scalable when delivered via an online social networking site.

The online learning experiences designed into the courselet were valuable to teachers in numerous ways. They provided an opportunity to use new communication technology tools to learn online, as well as structured activities for teachers to create artifacts to support their learning. The courselet also gave access to specialized TPD at a distance. Using online forums, blogs, videos, and other social media embedded in the oTPD delivery provided numerous opportunities for teacher-centered online learning experiences.

Building on these design principles, and taking into consideration the lessons learned from ongoing TPD delivered on the 2Learn2Gether.ca social networking site, an oTPD courselet model evolved. Seven design principles have been developed based on theoretical, pedagogical, and practical considerations of courselet delivery. These seven design principles are presented below with a brief description of the corresponding courselet learning activities .

1. Design learning relevant to teacher professional practice.
 - a. Ensure that the resources and the learning experiences are relevant to the learner.
 - b. Situate learning in current teaching challenges.
 - c. Design the learning activities so that they lead to an outcome that can be applied in teacher professional practice.

2. Provide easy teacher access, designing for flexibility and ongoing support.
 - a. Provide short, focused courselets addressing specific technology issues.
 - b. Design activities to allow flexibility and teacher choice in activities.
3. Provide theoretically and pedagogically sound activities.
 - a. Provide a rich array of resources to support learners' individual needs.
 - b. Support the teacher in linking conceptual understanding and practical application.
 - c. Provide activities that engage teachers with the content area using technology tools.
4. Provide support for learners with varied experience levels.
 - a. Provide a scaffolded educational environment that supports learning and reflection for a variety of learners.
 - b. Scaffold teacher opportunities for inquiry, engagement, and reflection.
 - c. Provide pre-courselet materials (in a variety of formats) to support tool use for new social networking site users.
5. Provide authentic opportunities for networked learning skill development.
 - a. Provide external resources as primary content.
 - b. Design activities to utilize blog and forum contributions.
 - c. Provide online lesson plan tools.
6. Support sharing and discourse among learners.
 - a. Design activities that focus on reflective practice.
 - b. Design activities that lead to meaningful learner discourse.
 - c. Provide opportunities for teacher collaboration.
7. Support learning connections to the broader networked community.
 - a. Utilize information sources external to the group.
 - b. Identify and share other potential sources of content information.

By developing oTPD offerings based on these design principles, we are providing teachers with meaningful and valuable PD that is quite different from other types of TPD. White-

house (2010) states—and we concur—that the networked learning environment blurs the meaning of “present” as teachers work across time and location, bringing new experiences of learning from social networking sites. This is therefore the potential that our oTPD research continues to strive for: to create opportunities for new teacher learning experiences online.

Delivery

In addition to the design principles of the oTPD courselet, it is helpful to understand the social media technologies used in the oTPD implementations as the model was honed. The oTPD courselet structure provided the following elements for teacher participants:

- courselet overview, which gave a short description of the courselet goals and outcomes of participation;
- courselet activity guide, which presented links and participant expectations for each week of courselet activities; instructions and links to external articles and Web sites, as well as internal courselet videos, were described in each of the weekly activity guides;
- group blogs, which allowed participants to use the threaded comments to track their own professional growth and challenges during the oTPD activities;
- personal blogs, which were used in some courselets to allow participants to make private or public posts within the social networking site, while not being confined to the group space;
- discussion forum, which was used to initiate discussions to support the TPD activities that the facilitator moderated ;
- embedded videos, which included instructional segments on tools found within the courselet, such as “how to post a blog,” as well as external content exemplars found on YouTube;
- event calendar, which listed dates or suggested start times for activities within the courselet;
- external social bookmarking site, which was used to provide a collection of links around the specific topic being explored in the courselet;
- file-sharing folder, which allowed documents, such as additional “how to” guides, to be readily available for teacher participants; as well, the file-sharing capability made it possible for participants to upload images that demonstrated completed activities and to share documents such as lesson plans; and
- list of courselet participants, which provided easy access to profiles of courselet participants to all participants.

The “Robotics and Hands-on Activities in the Classroom” oTPD courselet was based on a constructionist design that provided learner engagement with the four tenets of constructionism (Bers et al., 2002). Numerous participants reported that this was their first TPD experience with LEGO robotics and that the experience provided a much-needed technology support activity for their teaching practice. One early career teacher indicated that he was assigned to a teaching position where LEGO robotics was the focus and that the oTPD courselet provided critically needed resources, networking, and classroom applications that were not made available to him any other way. The teacher reported that his students would have had far fewer opportunities to explore LEGO robotics activities without the timely and flexible access that the oTPD courselet provided.

The weekly activity guide presented links and participant expectations for each week of the “Robotics and Hands-on Activities in the Classroom” courselet activities. Instructions and links to external articles and Web sites, as well as internal courselet videos, were described in each of the weekly activity guides. Courselet videos included instructional segments on tools used within the courselet as well as external LEGO robot exemplars found on YouTube. Weekly discussions were initiated by the instructor in the courselet discussion forum, and the instructor moderated ongoing threads that supported the activities of each week. The file-sharing folder allowed the posting of PDF documents, including step-by-step “how to” guides. As well, the file-sharing folder made it possible for participants to upload images demonstrating a completed LEGO robot constructed as part of one week’s activities. The group blog, which allowed participants to post either an entry or threaded comments connected to an entry, was used by the instructor to have the participants track their own professional growth and challenges during the courselet activities. Teachers commented that the value of both the discussions and the blog postings appears to revolve around the sharing of resources and teaching strategies using these resources. The social networking framework in which the courselet was delivered, by default, lends itself to information sharing, contributing to the overall value to teachers of this type of oTPD delivery.

Following the constructionist pedagogy, there was evidence in the participant interactions that the Robotics courselet allowed teachers to form new relationships through the social networking environment and provided timely access and resources to support new classroom activities.

Findings

Findings of the first delivery of the “Robotics and Hands-on Activities in the Classroom” oTPD courselet indicate considerable value for participants in the manner in which the oTPD experience was delivered, the social networking learning experience, and the content of the courselet. The importance of flexibility of access to the courselet materials was a key finding. As part of the courselet, participants were directed to online resources and provided with the opportunity to dialogue with experienced LEGO robotics teachers on a flexible schedule over a period of eight weeks. Teachers reported that the flexibility of the courselet timeline and activities was a very important success factor as they often struggled

with finding time to access PD activities during teaching.

The second key finding was that the utilization of a social networking site for the delivery of the courselet supported TPD learning in a new manner. Participant feedback regarding the delivery of the courselet within a social networking site indicated that while some participants were familiar with the Web 2.0 toolset and used it daily in their teaching practice, it was new to other teachers and required time to learn how to navigate and use. Both groups of teachers reported that there was value in the social network site delivery. This finding highlights the value of providing oTPD activities in a social networking site as the authentic online learning opportunities themselves are a form of oTPD. Teachers reported learning about the use of online learning tools as a result of participating in the courselet, a significant courselet outcome. As Borko et al. (2009) indicate, teachers need these kinds of oTPD opportunities to be able to use these kinds of technology in the delivery of instruction to their students.

The third key finding was that the courselet effectively supported TPD learning about the LEGO robotics content. Outlining objectives and scaffolding learning for teachers by providing all of the materials at the beginning of the courselet was reported to assist teachers in knowing how to manage their progress through the activities. Instructional video segments and PDF materials supporting interactions, such as blog posting or lesson plan development, provided participants with needed asynchronous support. Access to new resources identified in the materials and in forum discussions was reported as very valuable for classroom application of LEGO activities. Networking with other teachers who were also integrating LEGO robotic activities and sharing experiences within this community allowed teachers to develop relationships that continued beyond the courselet activities. This networking with an extended LEGO robotics community was evidenced in two ways: Teacher participants asked to have continued access to the courselet artifacts and discussion space, and several participants volunteered to be involved in the 2010 FIRST Lego League (FLL, see <http://www.firstlegoleague.org/>) international competition as coaches or volunteers, due in part to their courselet participation.

Conclusion

In conclusion, the Robotics courselet provided an opportunity for teacher participants to experience, reflect, and plan for the implementation of a “new” constructionist pedagogical strategy in their instructional toolkit. By providing teachers with exposure to and experience with constructing robots, using guided reflective blogs, sharing resources and classroom implementation ideas through forum postings, and constructing a digital artifact (online lesson plan), the constructionist TPD design was demonstrated to be an effective method of oTPD. As well, the authentic learning opportunities afforded by the social networking site delivery format provided valuable technology-related skills and knowledge. Findings support the development of a new online teacher community that has the potential to provide ongoing access to resources and expertise. The delivery of technology oTPD activities provided within a social networking software community holds promise for the further support

of LEGO robotics technologies in the classroom with the potential of sustaining a mature robotics online teacher community.

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ODL and the Impact of Digital Divide on Information Access in Botswana



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Abstract

Open and distance learning (ODL) has created room for the emergence of virtual education. Not only are students found everywhere and anywhere undertaking their studies and earning their degrees, but geographical boundaries between nations no longer appear to have much relevance. As the new education paradigm irretrievably alters the way teaching and learning is conducted, the application of modern educational ICTs has a major role to play.

With students of transnational or cross-border education dispersed into various nooks and crannies of Botswana, many others enlist for the “home-baked” distance learning programmes from their diverse locations. Like the face-to-face conventional students, distance learners also have information needs which have to be met. But blocking the distance learners’ realization of their information needs is the digital divide, which further marginalizes the underclass of “info-poor.”

The survey method was used, and a questionnaire administered to 519 students of four tertiary level distance teaching institutions that met the criteria set for the study yielded a 70.1% response rate. The results showed that while the Government of Botswana has made considerable effort to ensure country-wide access to ICT, which now constitutes an effective instrument for meeting information needs, a number of problems still exist. The factors impeding easy access are unearthed. The findings of an empirical study portraying some learners as information-rich and others as information-poor, and the consequence of distance learners studying on both sides of the digital divide, are discussed. Suggestions on bridging the digital divide are offered.

Keywords: Distance learners; cross-border students; digital divide; information environment; ICTs; library/librarian; Internet service providers (ISP); data service providers (DSP); information literacy skills (ILS); online

Introduction

Historically, learning took place within the classroom or facility of a school or an institution where the student and his teacher met face-to-face. But the advent of distance education has significantly altered the pattern, with the result that learning can now take place with the help of some media, usually print, when the teacher and student are separated. Today, the new digital world has made the delivery of virtual education and training possible. With the development of information and communication technologies and their application to education and training, not only are distance learners increasingly found everywhere and anywhere undertaking their studies and earning their degrees, but the geographical boundaries between nations no longer pose difficulties or inhibit learners' access to education from institutions outside their countries of abode.

As in many other countries across the world, the thirst for education in Botswana has led people to search and register for distance education programmes not only with the University of Botswana but also with some institutions outside the country. In this study, those who have registered for their distance programmes in Botswana are referred to as home-based, while the cross-border students are those who have registered with institutions outside Botswana but are working or living in Botswana.

The doubts of some authors regarding distance education have revolved around how distance learners would gain access to information resources and services and meet their information needs. It has always been known that information support services are a part of higher education programmes that add to the value and quality of learning. This is why Appleton (1997) suggests that access to quality information resources and services is a critical factor in any academic programme of merit. In their perception of the library as an information provider, Kascus and Aguilar (1988) affirm that library support is an integral part of quality education and a vital service that should be available to all students, whether on-campus or off-campus. While the library is an important information source, the information environment of distance learners extends beyond it. The demands of the contemporary distance learning environment require the application and use of digital contents obtainable from or via the Internet, and other media such as radio/television, telephones, and other computer or electronic devices that can be used when the library is not available.

In Botswana, government policy on information and communication technologies is to create a favourable information environment for the people. It is reasonable to assume that when these policy goals are translated into action, the dispersed distance learners especially will benefit tremendously. Hall and Lewin (2005, p. 86) observe that the Government of Botswana, in its recognition of the importance of ICT to the future economic and social development of the country, articulates its vision as follows:

Botswana will be a global competitive knowledge and information society where lasting improvement in social, economic and cultural development is achieved through effective use of information and communications technology.

In clear terms, Hall and Lewin (2005) articulate the ICT guiding principle of the Government of Botswana when they declare the following goals:

1. to create an enabling environment for growth of ICT in the country;
2. to provide universal service and access to information and communications facilities in the country with, for example, an Internet access point in every village; and
3. to make Botswana into a regional ICT hub so as to make the country's services sector globally competitive. (p. 86)

The efforts of the Government of Botswana to ensure countrywide access to ICT can be seen in the liberalization of telecommunications services and the breaking of the monopoly of Botswana Telecommunications Corporation (BTC) when mobile telephony licensing was awarded to two private companies in 1998. Sebusang, Masupe, and Chumoi (2005) also indicate that “the subsequent licensing of other service providers such as Internet service providers (ISPs), data service providers (DSPs) and private telecommunications networks (PTNs) has added to the overall growth of the sector.” The introduction of the PTNs and ISPs, among other steps, is seen as part of the effective design to help people in Botswana, including distance learners, to meet their information needs. Further, using seven countries, namely Estonia, Malaysia, Mauritius, Namibia, South Africa, Trinidad and Tobago, and Canada as relevant ICT benchmarks, Botswana developed an ICT policy covering the following major areas: ICTs in homes and communities, ICTs in healthcare, ICTs in the marketplace and ICT sector, ICTs in government, ICT-enabling infrastructure, and ICT-enabling legislation (Government of Botswana, 2004, pp. 1–2). This is probably why Little and Bose (2004, p. 14) exclaim that Botswana “is already an active participant in the global information society.” As if to lend credence to the assertion, Mogotlhwane (2008, p. 247) noted that the employees of the Government of Botswana have access to computers and fairly fast networks by African standards, as well as ICT skills. He regrets, however, that despite this, there are still information flow delays that lead to long waits and hence customer dissatisfaction. In light of the commitment of the Government of Botswana to ensure countrywide access to ICT, the hypothesis that the digital divide has been narrowed and the tyranny of distance often experienced in open and distance learning curtailed by the environment created for the growth of ICT could be tested.

One problem that seems to confront and impinge on not only Botswana's but the world's

information environment is the issue of digital divide.

In defining the concept of digital divide, Digital Divide Network (2004) perceives the phenomenon as the gap between those who can effectively use new information and communication tools, such as the Internet, and those who cannot. Chen and Wellman (2003), on the other hand, define the digital divide as the multidimensional inequalities in Internet access and use, ranging from the global level down to nation states, communities, and individuals. Similarly, Fuchs and Horak (2008) posit that the digital divide refers to unequal patterns of material access to, usage capabilities of, and benefits from computer-based information and communication technologies due to certain stratification processes that produce classes of winners and losers in the information society and in terms of participation in institutions governing ICTs and society. Norris (2001, p. 68) has noted that

The chief concern about the digital divide is that the underclass of info-poor may become further marginalized in societies where basic computer skills are becoming essential for economic success and personal advancement, entry to good career and educational opportunities, full access to social networks, and opportunities for civic engagement.

The apprehensions of scholars like Cavanagh and Tucker (1997) and Daniel (1999), among others, about the problem created by the use of technologies have received reinforcement from other researchers. These authors have expressed their reservations about the observed disparity of technological development, use, and application between the two worlds. For instance, Adams (1997) confesses that one concern he personally has for the future of off-campus services involves “the drift towards increasing disparity between the technology-rich and technology-poor.” He suggests that once off-campus services become technology-driven, they must stay the course. The problem he anticipates, however, is that IT is expensive, requiring, for example, microcomputers and servers, Internet connectivity, technical upgrades and software—plus staff to develop, maintain, and train users of web-based resources, and so on. Postle et al. (1997) hold the view that “technologies have the capacity to affect all students, but they appear particularly critical in their potential to address many of the problems of educational participation by rural and geographically isolated people.” They further believe that technologies have the potential to have a very negative impact on equity. In citing their example to support this view, they seem to affirm the view of Adam noted above. They maintain that if too heavy a reliance is placed on “new technologies” in education without moves being made to ensure wide access to these technologies, the gap between the “haves” and “have-nots” will be further widened.

Mutula (2005), in a proposal on bridging the digital divide through e-governance, observes that the digital divide is always described in terms of the difference in the number of telephones, Internet users, or computers per head between rich and poor countries. Quoting the observation of Kenny and Fink in their study of global digital divide, he pointed out that the digital divide’s size and importance have been overstated and that current trends

suggest that it is actually shrinking, not growing. Mutula notes that Kenny and Fink's view that the digital divide is narrowing is based on the fact that over the past 25 years, telephone penetration has been increasing faster in low- and middle-income countries than in high-income countries because market saturation has been achieved in rich countries. The duo, according to Mutula (2005), pointed out that Internet usage, for example, grew by around 50% per year in high-income countries in the late 1990s compared with 100% growth per year in low- and middle-income countries. He said the authors in their advocacy noted that the rich countries were ahead but that poor countries were also catching up very fast. Along with other authors like Nua (2002), Mutula (2005) observes that the digital divide in developing countries in general and Africa in particular is closely tied to the contextual economic environment of the respective countries. As if to defend the position of Botswana, Mogotlhwane (2008, p. 249) declares that Botswana faces unique challenges, mainly because it is a consumer country. He observes that in the modern globalised world, successful countries are those that produce goods and services for the globalised market and concludes that Botswana as a consumer country lies on a fragile borderline. In dismissing the opinion that the digital divide is shrinking, Van Dijk (2005, p. 50) declares:

The argument that the digital divide is shrinking, as the lowest categorical values are expanding at a higher rate than the highest values, is misleading. . . . When a developing country increases its Internet access rate from 0.1% to 2% while a developed country climbs from 20% to 40%, the expansion rate of the developing country is 10 times as high as that of the developed country. However, it is much more telling in this case that the point change of the developed country is much larger. Many more new Internet users have been added.

Norris (2001) has earlier argued that once countries became affluent enough, Internet access would follow along with connectivity. The problem would be that for many countries affordability would not be possible due to social inequality. Mutula (2005) expresses the view that the issue of digital divide in Africa manifests itself in various ways. A collaborative study he did with a Fulbright Scholar from Union College, New York on the satisfaction level of students using the Internet at the University of Botswana revealed that bandwidth was a major problem. He observed that the system tray of his office computer at the University of Botswana displayed a constant access speed of 10 Mbps. In contrast, the same reading on the Fulbright Scholar's office computer at Union College was a constant access speed of 100 Mbps, ten times faster, although it measured only the interval between the personal computer and the final router or switching point to which it was connected.

Awareness of the above challenges notwithstanding, this study set out to examine the following questions:

1. To what extent do distance learners use ICTs in meeting their information needs in Botswana?

2. How do distance learners in Botswana access information resources and services?
3. How adequately are distance learners in Botswana equipped to utilize the information resources and services available in their environment?

In developing the theoretical concept for this study, Norris's (2001, p. 4) description of the digital divide as a multidimensional phenomenon is considered apposite. Norris possibly has the remoteness of distance learners and cross-border students in mind when she proposes three types of digital divide: social (within countries), global (between countries), and democratic (between those able and those unable to use ICTs to take part in public life). Social divide is further signified by the gap between information-rich and information-poor in each nation. It also explains the income gap, which makes the difference between those who can afford computer and Internet access and those who cannot; global divide is signified by divergence of Internet access levels between industrialized and developed societies; and democratic divide is signified by the difference between those who do, and do not, use the opportunities of digital resources to engage, mobilize, and participate in public life. In a similar vein, the argument of Wilson (2006) on eight aspects of digital divide is found beneficial and therefore incorporated. These, according to Wilson (2006) include physical access (access to ICT devices), financial access (cost of ICT services relative to annual income), cognitive access (ICT skills), design access (usability), content access (availability of relevant applications and information online), production access (capacity to produce one's own content), institutional access (availability of institutions that enable access), and political access (access to the governing institutions where the rules of the game are written).

Methods of Study

The survey method was used for this study, and research design was both qualitative and quantitative. The four distance teaching institutions that met the criteria set for the study were the University of Botswana (UB), the University of Derby (UD), the University of South Africa (UNISA), and the Management College of Southern Africa (MANCOSA), the last three being cross-border institutions in Botswana. The empirical element of the study was conducted using the questionnaire as instrument. With a 20% sample size randomly selected from institutions with 500 or more students, University of Botswana and University of South Africa qualified, while the census method was applied to the UD and MANCOSA, which had 100 or fewer students in Botswana. A total of 519 of 1,996 (total population) became the sample size. With 364 copies of the questionnaire returned, the response rate was 70.1%. Data abstracted were analysed using the *SPSS* program. Cross-tabulations and chi-square, non-parametric statistical significance tests were developed to test the relationship of one variable to groupings of others.

Results

Use of ICTs to Meet Distance Learners' Information Needs

In order to address the research question “To what extent do distance learners use ICTs in meeting their information needs in Botswana?” a series of questions was generated. First, participants were asked if they had access to a computer with Internet facilities. The result shows that a total of 287 respondents (78.8%) indicated they had access to a computer with Internet facilities, while the remaining 77 respondents (21.2%) indicated they had no access. The relationships between location of respondents and access to a computer with Internet facilities were cross-tabulated and chi-square tests performed on the cross-tabulations. The test shows that location was significantly related to access to a computer with Internet facilities ($X^2 = 21.681$, $df = 2$, $p < .05$).

Table 1 shows the expected and observed counts in the cross-tabulation of location and Internet accessibility by distance learners. Comparison of the observed with the expected counts shows that the observed values are significantly different from the expected values and that more respondents in the city and town than expected said “yes” to having access to a computer with Internet facilities, while fewer respondents than expected said “yes” in the village. Therefore the conclusion is that there is a significant relationship between location and access to the Internet. A number of subsequent tests also confirmed the prevalence of Internet accessibility in the city and town compared to the village. The findings confirm that the village is shortchanged when the use of and accessibility to information and communication technology in Botswana is considered. This seems to be a reflection of Wilson’s physical access view (access or non-access to ICT devices) and possibly an indication of Norris’s social divide hypothesis that location may create or foster information-rich or information-poor environments. The learners in rural areas *are affected*. Adequate arrangement should be made for the provision of ICT facilities like the Internet in some strategic locations including the villages if distance learners working or living in such locations are to maximally benefit from ICTs. The impact of the Maitlamo project (Government of Botswana, 2004) is yet to be fully felt in rural locations.

Table 1

Location and Access to Computer with Internet Facilities

			Access to computer with Internet facilities		Total	% of total
			Yes	No		
Location	City	Observed count	187(83.1%)	38(16.9%)	225	61.8
		Expected count	177.4(78.8%)	47.6(21.2%)	225.0	61.8
	Town	Observed count	51(87.9%)	7(12.1%)	58	15.9

		Expected count	45.7(79.8%)	12.3(21.2%)	58.0	15.9
	Village	Observed count	49(60.5%)	32(39.5%)	81	22.3
		Expected count	63.9(78.9%)	17.1(21.1%)	81.0	22.3
Total		Observed count	287(78.8%)	77(21.2%)	364	100
		Expected count	287.0(78.8%)	77.0(21.2%)	364.0	100.0

A follow-up question sought to establish where respondents would have access to the Internet if the response was in the affirmative. As shown in Figure 1 below, those who indicated they had access to the Internet at work on their own computer made up 45.6%; on their own machine at home, 22.5%; at work on a shared machine, 20.9%; and at home on a shared machine, 6.3%. In addition to the above, 28 other respondents specified other Internet access points they used. These include Internet café (6.0%), friend's office (0.3%), and other libraries (1.6%).

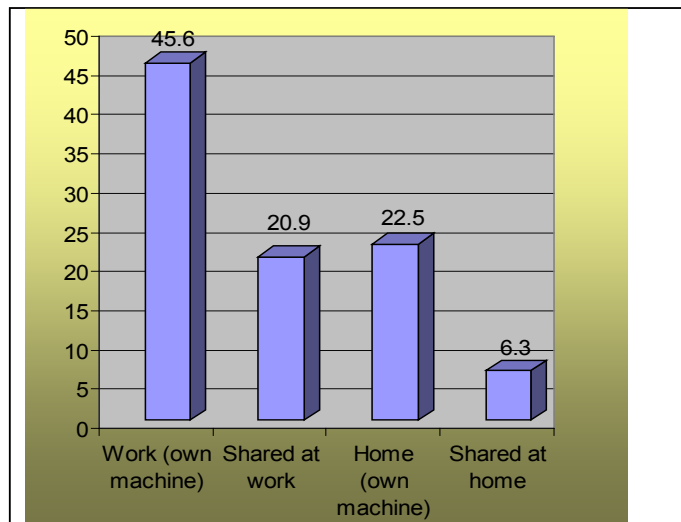


Figure 1. Internet access points.

The relationships between the institutions of respondents and access to a computer with Internet facilities were cross-tabulated and chi-square tests performed on the cross-tabulations. The test shows that institution was significantly related to access to a computer with Internet facilities ($X^2 = 13.359$, $df = 3$, $p < .05$).

Table 2 shows the expected and observed counts in the cross-tabulation of Institution and Internet accessibility by distance learners. Comparison of the observed with the expected counts shows that the observed values are significantly different from the expected values and that more respondents from all the cross-border institutions than expected said “yes” to having access to a computer with Internet facilities, while fewer respondents than expected said “yes” in the UB (home-based institution). Therefore the conclusion is that there is a significant relationship between Institution and access to the Internet. It can also be concluded that, possibly because most of the cross-border institutions are involved in running postgraduate programmes, the respondents from those institutions were much more

gainfully employed and therefore had more opportunity to access a computer with Internet facilities. This tends to indicate the strength of the cross-border students in financial access, which was cited earlier in Wilson’s argument. Also reflected are Wilson’s design access (usability) and content access (availability of relevant applications and information online), as well as institutional access (availability of institutions that enable access). The result also seems to have some bearing on Norris’s global (between countries) type of digital divide. Though a number of subsequent tests revealed that accessibility to the Internet was facilitated mostly in respondents’ places of work, there was sufficient evidence to show that family resources facilitated accessibility of some respondents. Thus, Norris’s social divide, which differentiates between those who can afford computer and Internet access and those who cannot, was verified. See details in Figure 2 below.

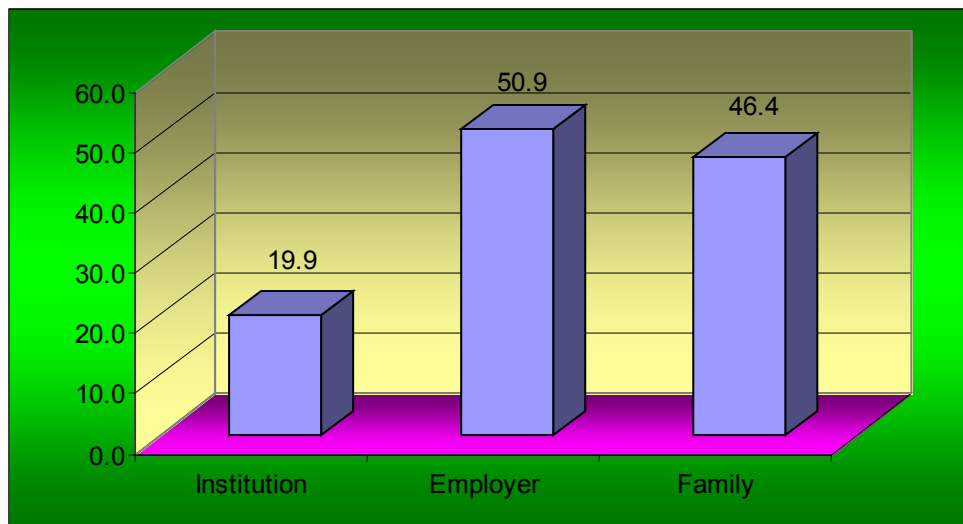


Figure 2. Who pays the cost of using the Internet?

Table 2

Institution and Access to Computer with Internet facilities

		Access to computer with Internet facilities				
				Total	% of total	
			Yes	No		
Institution	UB (Home-based)	Count	66(67.3%)	32(32.7%)	98	26.9
		Expected count	77.3(78.9%)	20.7(21.1%)	98.0	26.9

	UNISA (Cross-border)	Count	128(81%)	30(19%)	158	43.4
		Expected count	124.6(78.9%)	33.4(21.1%)	158.0	43.4
	MANCOSA (Cross-border)	Count	36(80%)	9(20%)	45	12.4
		Expected count	35.5(78.9%)	9.5(21.1%)	45.0	12.4
	UD (Cross-border)	Count	57(90.5%)	6(9.5%)	63	17.3
		Expected count	49.7(78.9%)	13.3(21.1%)	63	17.3
Total		Count	287(78.8%)	77(21.2%)	364	100
		Expected count	287.0(78.8%)	77.0(21.2%)	364.0	100.0

Another question asked if the respondents use the Internet or any other electronic database to supplement their reading or writing of assignments. A total of 291 respondents (79.9%) indicated “yes,” while 73 (20.1%) said “no.” Other ICTs in use as indicated by respondents include email (46.2%) ($n = 168$), WebCT (27.7%), and online databases/sources (28.8%). Email was seen to be a satisfying information source by 31.9% of respondents.

Access to Information Resources and Services by Distance Learners

Another research goal was to establish how distance learners in Botswana access information resources and services. In order to address the issue, the respondents were asked a number of questions, ranging from how they received library and information support services to whether their institution provided them adequate library and information service to how they contacted their library/subject librarian. Information was also sought on the use of the Internet (electronic sources) and who paid the cost of using the facility. Respondents were also asked if they accessed their institutional library Web site and how often, if yes.

With respect to how the respondents received library and information support service, most of them (45.9%) indicated “buying their own materials” as the major source. In other words, a significant number of the respondents accessed information from materials (books) they bought on their own. In order to access information resources and services, 40.9% of respondents also personally traveled to their institution’s library. Those who indicated that they accessed or received library and information support through online or electronic supply comprised 32.7% and those who accessed or received library and information support

through collaboration with some libraries and information centres comprised 27.5%. It is remarkable to note that 26.6% indicated that they received support service by asking for help from knowledgeable people. Less than a quarter of the respondents (22.0%) indicated that they received the support service through direct supply by post from their institution's library. Figure 3 provides some details at a glance. It is also important to note that quite a substantial number (57%) indicated that their institutions did not provide them with adequate library and information support. Hence, they accessed information resources and services through other libraries. As indicated, libraries the distance learners used include the University of Botswana (UB) main library (40.7%), UB branch library (28.6%), public library (31.6%), colleges of education (8.5%), and other institutional libraries within the country (9.6%).

The relationships of the institution with other libraries used by the respondents were cross-tabulated and chi-square tests were performed on the cross-tabulations. The result shows that Institution was significantly related to the UB main library ($X^2 = 12.476$, $df = 3$, $p < .05$), UB branch library ($X^2 = 13.662$, $df = 3$, $p < .05$), and public library ($X^2 = 11.522$, $df = 3$, $p < .05$) in terms of libraries used. Further details show that a large number of cross-border students used or accessed information at the UB main and branch libraries.

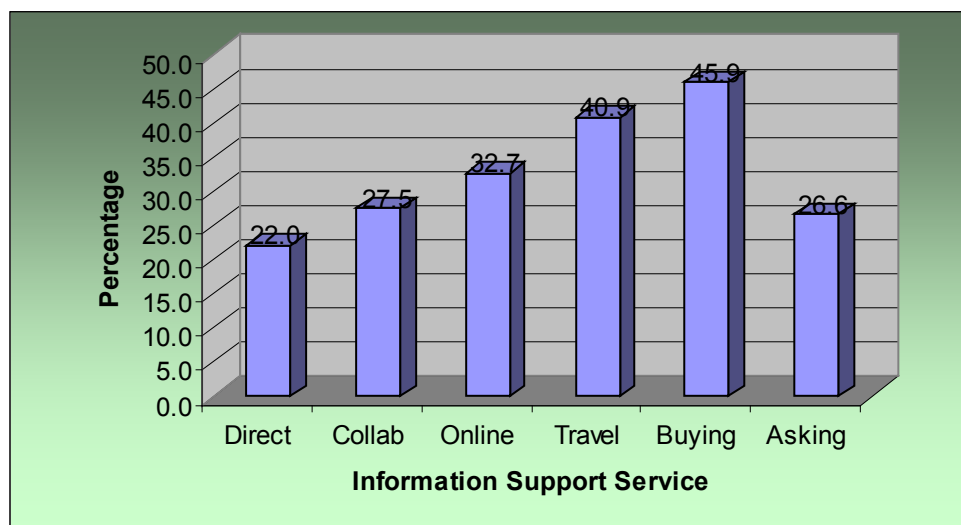


Figure 3. How students access information resources and services.

In accessing information resources and services, it was expected that students would contact library and/or subject librarians. On inquiring into how they contact the library or subject librarian to meet their information needs, a majority of respondents, 193 (53%) indicated they visited the library/subject librarian in person. Regrettably, about a third of the respondents, 120 (33%) said they maintained no contact either with the library or any subject librarian. Getting in touch with the library or subject librarian through email facilities attracted 73 respondents (20.1%). Less than 5% made use of other options. In descending order, writing/posting a letter and getting in touch through facsimile had 16 respondents (4.4%) each; only 13 respondents (3.6%) claimed they used a toll-free telephone number, while only 12 (3.3%) used Short Message Service (SMS), often called text messaging, with a

cell/mobile phone. An insignificant few, only 7 respondents (1.9%), left messages on a telephone answering machine. Figure 4 shows the different means through which the distance learners contacted the library or subject librarian.

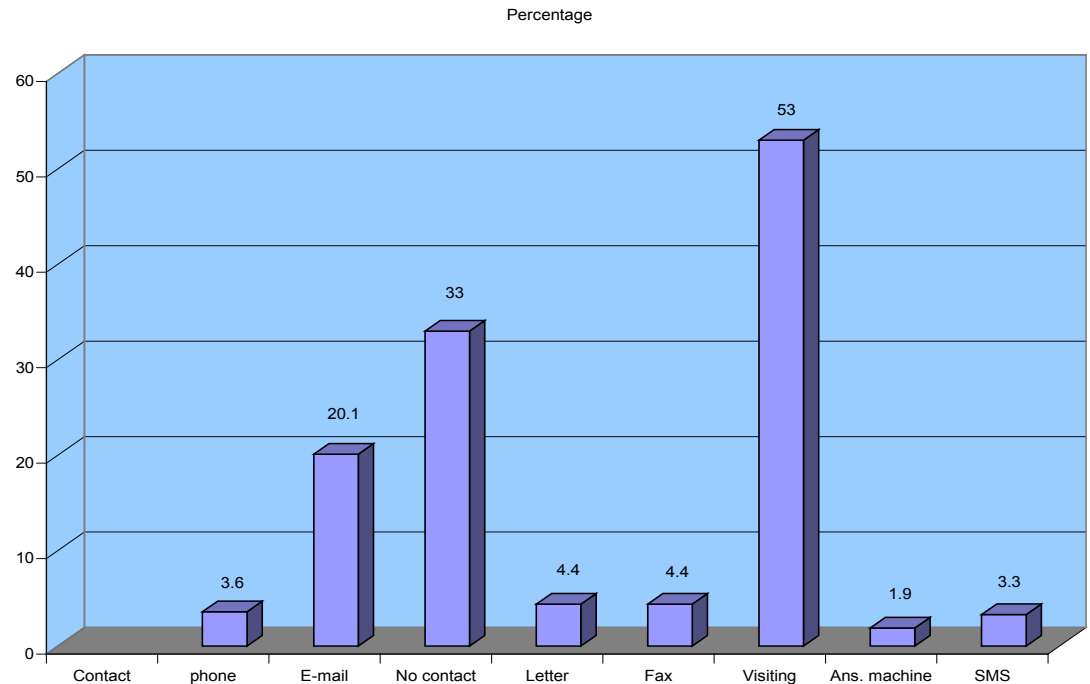


Figure 4. Contacting library/subject librarian.

As to whether they accessed their institutional library Web site, 52.2% responded in the affirmative and 39.3% in the negative. The relationships between location and accessing the institutional library Web site by distance learners were cross-tabulated and chi-square tests performed on the cross-tabulations. The test shows that location was significantly related to accessing their respective institutional libraries ($X^2 = 12.408$, $df = 2$, $p < .05$).

Table 3 shows the expected and observed counts in the cross-tabulation of various locations (city, town, and village) of distance learners and whether they accessed their respective institutional library Web sites. Comparison of the observed with the expected counts shows that the observed values are significantly different from the expected values and that more respondents in the city than expected said “yes,” while fewer respondents than expected said “yes” in the village. In the town, the number observed was about the number expected. Notwithstanding the outcome of the town results, the conclusion is that there is a significant relationship between location and accessing the Web site of their institutional libraries. The findings still substantiate the fact that the village and the city are quite different with respect to the use of and accessibility to electronic database or digital contents. These also depict the social divide of Norris, the gap between the information-rich and information-poor and the democratic divide, which signifies those unable to use ICTs in order to take part in public life. The institutional library Web site, among other things, usually has a section for the online public access catalogue (*opac*) of the library. It is possible to make

requests through the Web site. The *opac* page may also contain links to some e-journals, including full-text articles. Visiting the institutional library Web site would therefore give a hint as to how useful distance learners found the site. In this respect, the frequency or regularity of access to the institutional library Web site was examined. Of the 197 who responded to the question, 98 respondents (49.7%) said they visited the Web site regularly, 38 (19.3%) once a week, 17 (8.6%) twice a month, 23 (11.7%) once a month, and 10 (5.1%) once in three months; 9 (4.6%) indicated they never visited the Web sites, while 2 others indicated they visited their library Web site only when they considered it necessary.

Table 3

Location – Do you Access your Institutional Library Web Site?

		Do you access your institutional library Web site?				
		Yes	No	Total	% of total	
Location	City	Count	133(63.3%)	77(36.7%)	210	63.1
		Expected count	119.8(57%)	90.2(43%)	210.0	63.1
	Town	Count	29(55.8%)	23(44.2%)	52	15.6
		Expected count	29.7(57.1%)	22.3(42.9%)	52.0	15.6
	Village	Count	28(39.4%)	43(60.6%)	71	21.3
		Expected count	40.5(57%)	30.5(43%)	71.0	21.3
Total		Count	190(57.1%)	143(42.9%)	333	100
		Expected count	190.0(57.1%)	143.0(42.9%)	333.0	100.0

Equipping Distance Learners to Utilize Information Resources and Services

The third objective of the study was to determine if distance learners were adequately equipped to utilize the information resources and services available to them. In addressing the research question derived from the objective, a number of questions on computing and information literacy skills (ILS) training were raised with the respondents. First, when asked if they had received any training on the use of computers, 256 respondents (70.3%) said they had received training, while another 107 (29.4%) said they had not. Asked how the training was arranged, 58.3% indicated they received the training through their employers in their respective workplaces. Another group of 34.0% specified that they arranged the training on their own; 28.2% said they received the training through the module given to them; and 14.2% claimed they were trained during a residential session arranged for them by their institutions. Another 0.8% indicated that they were trained in the use of computers in their previous institutions. Figure 5 provides some details.

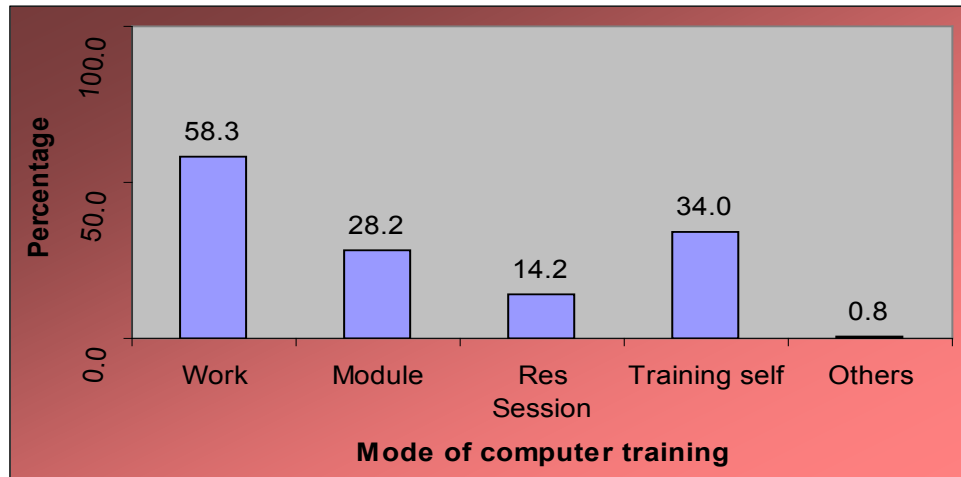


Figure 5. How computer training was received.

The relationships between the institutions of respondents and computer training were cross-tabulated and chi-square tests performed on the cross-tabulations. The test shows that the institution of respondents was significantly related to computer training ($X^2 = 16.923$, $df = 3$, $p < .05$).

Table 4 shows the expected and observed counts in the cross-tabulation of Institution and the computer training by distance learners. Comparison of the observed with the expected counts shows that the observed values are significantly different from the expected values and that fewer respondents from all the cross-border institutions (UNISA, MANCOSA and UD) than expected said “yes” to receiving training on the use of computers, while more respondents than expected said “yes” in the UB (home-based institution). Therefore the conclusion is that there is a significant relationship between Institution and computer training. The findings evidently imply that UB provided more computer training to its students than the cross-border institutions to their students. It seems ironic that although the cross-border students had better access to the Internet, the results showed they lacked computing skills training. This clearly confirms the cognitive access (ICT skills) aspect of the digital divide that Wilson (2006) explains. Conversely, the “home-based” students seemed to enjoy institutional access (availability of institutions that enable access).

Table 4

Institution – Did/Do you Receive any Training on the Use of a Computer?

		Training received on use of computer				
			Yes	No	Total	% of total
Institution	UB (Home-based)	Count	84(86.6%)	13(13.4%)	97	26.7
		Expected count	68.4(70.5%)	28.6(29.5%)	97.0	26.7
	UNISA (Cross-border)	Count	101(63.9%)	57(36.1%)	158	41.6
		Expected count	111.4(70.5%)	46.6(29.5%)	158.0	41.6
	MANCOSA (Cross-border)	Count	31(68.9%)	14(31.1%)	45	12.4
		Expected count	31.7(70.4%)	13.3(29.6%)	45.0	12.4
	UD (Cross-border)	Count	40(63.5%)	23(36.5%)	63	17.4
		Expected count	44.4(70.5%)	18.6(29.5%)	63	17.4
Total		Count	256(70.5%)	107(29.5%)	363	100
		Expected count	256.0(70.5%)	107.0(29.5%)	363	100.0

Acquisition of information (literacy) skills (ILS) was also considered important in equipping distance learners for effective and efficient utilization of information resources and services. Some information was therefore elicited from respondents on these skills through the questionnaire. First, the respondents were asked if their institution provided them training on information (literacy) skills. With only 2 specifying “missing system,” 192 respondents (52.7%) said “yes,” while 170 of them (46.7%) responded “no.” In determining how the training was received by those who said they were trained, a number of options were presented. As shown in Figure 6, a majority of respondents (63.6%) indicated that they received their training through the module given to them, 36.4% through face-to-face teaching during orientation, and 31.0% through tutoring during residential sessions; 9.1% claimed they received the training by e-learning mode, while 0.01% others said the training was received from their previous institutions.

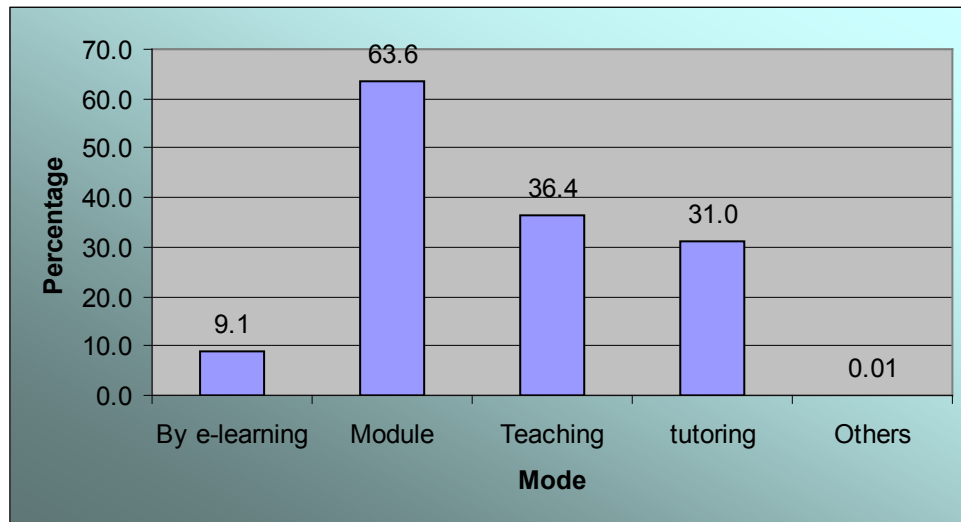


Figure 6. Mode of receiving ILS training.

The relationships between the institutions of respondents and information skills training were cross-tabulated and chi-square tests performed on the cross-tabulations. The test shows that Institution was significantly related to information skills training ($X^2 = 32.870$, $df = 3$, $p < .05$).

Table 5 shows the expected and observed counts in the cross-tabulation of Institution and information skills training of distance learners. Comparison of the observed with the expected counts shows that the observed values are significantly different from the expected values and that it was only in UB that more respondents than expected said “yes,” whereas in other institutions (cross-border, including UNISA, MANCOSA, and UD) fewer respondents than expected said “yes.” The conclusion, therefore, is that only the UB provided information skills training for its students and that other (cross-border) institutions did not. While the UB (home-based) could be seen in terms of Wilson’s institutional access (an institution that enabled access), the results did not portray the remaining cross-border institutions as those that enabled access.

Table 5

Institution – Did your Institution Provide Training on Information Skills?

		Did your institution provide training on info skills?				
			Yes	No	Total	% of total
Institution	UB (Home-based)	Count	76(77.6%)	22(22.4%)	98	27.1
		Expected count	52.0(53.1%)	46.0(46.9%)	98.0	27.1
	UNISA (Cross-border)	Count	67(42.7%)	90(57.3%)	157	43.4
		Expected count	83.3(53.1%)	73.7(46.9%)	157.0	43.4
	MANCOSA (Cross-border)	Count	19(43.2%)	25(56.8%)	44	12.2
		Expected count	23.3(53%)	20.7(47%)	44.0	12.2
	UD (Cross-border)	Count	30(47.6%)	33(52.4%)	63	17.4
		Expected count	33.4(53%)	29.6(47%)	63.0	17.4
Total		Count	192(53%)	170(47%)	362	100
		Expected count	192.0(53%)	170.0(47%)	362.0	100.0

Conclusion and Recommendations

This study confirms that more information resources and services are available in the city than in the town or village. The results show that there is abundant evidence of the digital divide in Botswana, notwithstanding the popularized Maitlamo Project on ICT policy of the government. Accessibility to digital resources by distance learners is seen to have a locational dimension in that it is much more convenient to access information in the metropolitan areas than in rural locations. In other words, the more rural a location, the less the chance of having adequate information resources. The tyranny of distance is still a serious factor to learners who, for any reason, are located outside the city. The development of disparity as a result of the location of individuals has been observed by Slade (1997). Slade regrets that “we may see a class system developing among distance learners” and also that

“urbanites will have high-speed connections to the World Wide Web and ready access to information resources” in contrast to rural students. Slade (1997) predicts that students located in rural areas will remain dependent on local libraries or a library delivery service from campus until such time as it is economically feasible for cable or telephone companies to run high-speed data transmission lines into the average household or until Internet access by satellite becomes widely available. The study reveals evidence of Cavanagh’s (1997) remarks that many students still do not own (whether by choice or lack of resources) the necessary equipment to participate in the new era of instant information access.

In order to curtail the effects of the emerging class system in tertiary distance and cross-border education in Botswana and ensure that electronic access issues do not lead to even greater student isolation and that teachers are not “pushed further into becoming designers of pre-packaged programmed learning” (Stephens & Unwin, 1997), the following suggestions are offered.

- More effort should be exerted by the Government of Botswana on its Maitlamo ICT policy and the policy implementation, especially in rural locations. Because most villages in Botswana enjoy relatively stable electricity and telephone connections, encouragement should be given to private ISPs, DSPs, PTNs, and government agencies to spread their services beyond municipalities to rural locations.
- Distance teaching institutions need to not only teach but also make computing and information literacy skills training mandatory for distance learners.
- Information resources and services should be provided through establishment of study centres in strategic locations and collaborative partnerships with viable institutions, schools, or public libraries.
- Adequate utilization of cell phone functionalities should be encouraged.
- The use of modern ICTs such as email, facsimile, and telephone answering machine should be encouraged.
- Services available for DLs, including the use of librarians and help/reference desks, should be adequately promoted.
- Although the information world is increasingly digital, the distance learning environment in Botswana is still largely print-based, and this should be respected.

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Increased Technology Provision and Learning: Giving More for Nothing?



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Abstract

The development of new communication technologies has led to a push for greater technology use for teaching and learning. This is most true for distance learning education, which relies heavily on new technologies. Distance learning students, however, seem to have very limited time available for studying and learning because of work and/or family commitments. This paper focuses on the actual use by distance learning students of different teaching and learning resources and their associated teaching technologies (learning tools). The organisation of one module has been conceptualised as a toolbox, encompassing all the learning tools provided to students. This toolbox also explicitly includes an embedded priority system for the examination of available learning resources, conceptualised as a *traffic-light toolbox* in this paper. Results from a survey on the resources actually used by students show that students are indeed time-constrained. Students consequently follow the priority system embedded into the module and do not use non-examinable resources much. This paper concludes that students' specific needs or situations need to be considered for the design of an effective learning toolbox, as opposed to just providing a bundle of learning tools that may be effective on their own.

Keywords: Distance learning; technology; priorities; time-constraint; module organisation

The Push for Greater Technology Use and Time for Learning

Communication technologies are now part of most aspects of our lives, and the educational sector is no exception. This is true for distance learning (off-campus) and also increasingly for campus-based education with a combination of face-to-face and off-campus teaching. This greater use of communication technologies in education is associated with the current rationale underlying university curriculum building for both on- and off-campus provision

(i.e., blended learning.) Blended learning, according to the literature, enhances learning most effectively (Garrison & Kanuka, 2004) and can be defined as “[the design and delivery of] the right content in the right format using *the right mix of media*” (Debande & Ottersten, 2004, p. 34, adapted by Boitshwarelo, 2009, p. 2, *emphasis added*).

These “new” communication technologies were first used to *facilitate* educational provision through material distribution and interaction. These technologies later led to the design of specific technology-based educational tools to *enhance* teaching and (blended) learning. These technology-based educational tools are now fully embedded in the university curriculum as *media* for educational provision. These tools are customised to specific contexts and issues faced when enhancing teaching and learning. Most studies on the use of technologies for learning and teaching detailed in the literature so far have focused on some of the following issues:

- how to promote online interaction and the building of learning communities, seen as a necessary condition for effective learning (e.g., Beldarrain, 2006; Brindley, Walti, & Blaschke, 2009);
- the effectiveness of web-based compared to face-to-face learning and teaching (e.g., Cheaney & Ingebritsen, 2005; Brown & Green, 2009);
- assessing the effectiveness of any given technological tool to induce learning (e.g., Kodama, 2001);
- the paradigm shifts induced by technological and distance learning developments; as the technology develops, it induces revisions in distance learning design and provision (e.g., Beldarrain, 2006); and
- the paradigm shifts toward student-centred learning and teaching in relation to student demands and toward blended learning (e.g., Beaudoin, 1990; Calder, 2000).

Because of their common off-campus nature, campus-based education with some off-campus teaching and distance learning education face similar issues. Off-campus educational provision is complemented, however, by on-campus face-to-face interactions, which is not the case in distance learning. Consequently, technology-based educational tools used in campus-based education with some off-campus teaching and in distance learning education are similar to a certain extent but are not necessarily the same.

Distance learning can be simply defined as (higher) education that is not delivered on a face-to-face basis, (i.e., education that is necessarily fully provided off-campus) (Calder, 2000). It is interactive, with email exchanges and discussions mostly on an asynchronous basis (Cheaney & Ingebritsen, 2005). Distance learning also requires independent study of the material compared to an equivalent face-to-face setting (Bray, Kumiko, & Dlugosh, 2008). This form of education has been promoted as being more inclusive through widening participation (Calder, 2000). Distance learning attracts students who have very heterogeneous learning styles and who are different from those involved in campus-based edu-

cation (Berenson, Boyles, & Weaver, 2008). Distance learning students are usually found to be self-regulated (e.g., Lynch & Dembo, 2004; Artino, 2009) and self-directed in their learning (Bose, 2003). One of the main weaknesses of distance learning identified in the literature, however, is that these students are not very well known by their tutor and the people designing the course (as reported by Blakelock & Smith, 2006).

Also, paradoxically, distance learning can be both time-saving and more time-consuming, time-saving because saving time on travel allows greater flexibility in terms of the study time and place (Bose, 2003; SOAS, 2009; Arendt & Shelton, 2009) and more time-consuming because it takes longer to study and learn the material to be covered (Brown & Green, 2009). The theoretical literature and universities overall seem to be pushing for greater adoption of technological advances and tools. One of the dangers is that this push—so far unquestioned in the literature—could lead to an increase in the overall load of material to be covered and could render the identification of important information more difficult and time-consuming. Increased technology provision in distance learning could thus undermine the students' learning time-effectiveness and efficiency. More specifically, the actual relevance of this push for greater technology provision can be questioned for distance learning students, who are typically subject to a very strong time constraint and high workload (Blakelock & Smith, 2006). This time constraint might impact students' actual use of the technological teaching and learning tools provided, also depending on other factors, such as whether the material is examinable. Students' actual use of these tools will determine their effectiveness for learning and teaching: If not used, even the best learning tool cannot be effective for learning and teaching.

Three components for effective learning based on underlying modes of interaction have been identified in the literature: (i) technological tools as the basis for the type of educational content supply, (ii) student-centred delivery (i.e., in relation to demand), and (iii) teacher-centred teaching (i.e., in relation to supply) (Anderson & Garrison, 1998, cited by Anderson, 2003; Calder, 2000; Bray et al., 2008). In this framework, the current push for increased technology provision would seem based on supply only (i and iii), ignoring students' needs and demands (ii).

Hence the question of whether the technological tools provided are actually used by students, and if yes, which of these tools are used. This paper aims to investigate this question based on a survey of distance learning students. It thus focuses on the actual use by distance learning students of different teaching and learning tools, specifically the use of non-examinable resources under the strong time constraint imposed by each student's personal situation (because of family responsibilities and/or work).

Because of the nature of the case study, each of the technological tools considered is associated with specific types of teaching and learning resources. This paper does not aim to study the impact of a change in the technology to enhance learning for a specific resource, but rather considers a technology and a learning resource as a bundle, with the chosen technology assumed to be the most appropriate for a given learning resource under both time and technological constraints. This paper does not study the teaching pedagogies behind

the course design and technological tools or their actual effectiveness or efficiency. This approach simply emphasises that the best-designed technology-based tools need to actually be used by students to have a chance of being efficient for teaching and learning. This study is about checking that the supply of teaching and learning tools facilitated by specific technologies matches time-constrained students' demands. The study is particularly relevant in relation to better targeting the type of learning resources and associated technologies used by students.

This study also highlights the importance of the (distance learning) module design for the effective use of resources potentially associated with effective learning (Calder, 2000; Bray et al., 2008). It contributes to the current academic literature by describing a module organisation adapted to time-constrained students. This relatively common module organisation has not yet been described as a *traffic-light toolbox* (i.e., a toolbox of learning resources with an embedded priority system for examination).

An Example of Distance Learning Provision

The distance learning programme considered as an example in this paper is part of the University of London's Distance Learning Programme. Students are doing masters-level courses, some of them while working full time (in international organisations, consultancy firms, or government agencies). Because of the challenging nature of this context, this programme tends to attract bright students who are scattered around the world and who are subject to strong time constraints. Consequently, they also tend to be very motivated by their chosen topic of study, regardless of whether resources are examinable.

The academic year runs from February to October. As part of their programme of study, students have to complete some core modules and some elective modules. For each selected module, students receive a study guide, course textbooks, and key readings and have access to a virtual learning environment where they can interact together or with the designated module tutor. Each module study guide is divided into 10 units detailing the course core concepts in a written format. Each of these units is explicitly associated with specific key readings, including textbook sections and further readings. The key readings are compulsory (i.e., examinable) and further readings are optional. Specific links to the key readings and textbook sections were originally embedded within the text of each study guide unit but have been moved to the start of the unit, independent from the unit text. This was a practical measure, taken to facilitate changes to the individual components of the module material (i.e., study guide, key readings, textbook).

The evolution of the learning environment and the courses' written material seems to have been subject to two antagonistic principles:

- more independence between the core examinable materials (study guide units, textbook, and key readings) as a consequence of a practical approach to facilitate course revisions; and

- a greater inclusion of (extra) resources under the same platform (while remaining independent from one another).

The integration of the material—by linking all course resources together—now falls increasingly on students and tutors. Under a very strong time constraint and with a relatively demanding examinable core part, effectively linking the material together could thus become more difficult. These two mechanisms could also increase the time constraint placed on students by inducing a trade-off between the time spent learning or reflecting on the course material and the time spent identifying the important resources, as well as the time needed to link them together. These design problems for effective learning have been discussed in the literature (for more details, see Bouras et al., 2000; Anderson, 2003; Pituch & Lee, 2006; Kirkwood & Price, 2006).

Students can practice their exam skills through two tutor-marked assignments submitted on a voluntary basis. There is no formal deadline for tutor-marked assignment submission, only a suggested deadline in the module's study calendar. The tutor provides feedback within 10 to 15 days of submission. The general guidelines provided to tutors also recommend making information and discussions as available as possible to every student in order to achieve as widespread a diffusion of information as possible. Tutors send monthly e-digests to students, summarising the main points from the units, the main questions and answers, and the main extra resources posted in the online discussion. In practice, e-digests allow better learning resource access for those with a limited Internet connection (e.g., students in Africa) and psychologically help students to feel more connected to the group, as well as supported by their tutor.

The virtual learning environment is available through a Web interface for each module and includes by default a discussion forum section, the course study guide (each unit separately uploaded as a PDF file), a folder with all module e-digests sent out so far, a section where students can upload their tutor-marked assignments, and a section with exam papers from the previous two years. Module discussion forums were shared between several modules until 2009, and afterward became module-specific with an academic focus. In all years, students had access to separate complementary transversal discussion areas (i.e., discussion areas that are not dedicated to one or a group of pre-identified modules). Since February of 2009, tutors have been able to customise the virtual learning environment structure by creating folders and embedding extra resources such as wikis, videos, podcasts, RSS feeds, and Web sites (rather than posting links in the discussion area). The virtual learning environment features a built-in electronic module calendar with a link included in the course outline to increase its ease of access. This calendar is not provided by default but can be customised by tutors. This feature can potentially help students keep track of and pace their study, compared to using the paper-based version of the calendar. Students can also contact their tutor directly by email.

Conceptual Framework: The Traffic-Light Toolbox

From a tutor's perspective, the features of the virtual learning environment that allow embedding extra resources (e.g., Web sites, videos, podcasts, RSS feeds, wikis) provided some new opportunities. First, this new virtual learning environment makes it easier to check if these resources have been posted already, avoiding double posting. Second, these resources can be transferred to the following year's module material, which saves time and effort for the tutor across the years. Third, all these resources are relatively independent: It is easy to edit the list of extra resources over the study year and between study years. As it is quite time-consuming to upload all these extra resources in the first place, this is only worth doing as an investment in future gains in the tutor's time-effectiveness and only if students use the resources.

Distance learning students enrolled in this programme are usually very time-constrained, which effectively shortens the time they have to spend on the virtual learning environment, whether it be to read materials or to download and upload resources. This is particularly true for students who have a limited Internet connection, either because of the technical infrastructure to which they have access or because of personal reasons. Because of this time constraint, making information easier for students to find should intuitively make the time spent online more effective for learning purposes. The online module organisation could potentially be very important for students to make the most of the study material provided. This has been stressed in the context of integrating different technologies for teaching provision (Bouras et al., 2000). The standard module outline on the virtual learning environment has consequently not changed much in order to leave it comparable to the other modules read by students (i.e., with common organisational features between modules). This could make it easier for students to find information more effectively once they are familiar with the online virtual learning environment.

The following conceptual framework was developed based on the actual distance learning course design but could easily be adapted to different resources or module organisations. This conceptual framework has been represented schematically in Figure 1. Simply phrased, the module is seen in this paper as a toolbox, represented as the outer green ellipse, grouping different learning and teaching tools (rectangles and smaller ellipses). These tools include the individual course components, each associated with a corresponding teaching technology (PDF files, emails, discussion areas, wikis, RSS feeds, Web sites, videos). The tools considered here are only those provided to students by the programme.

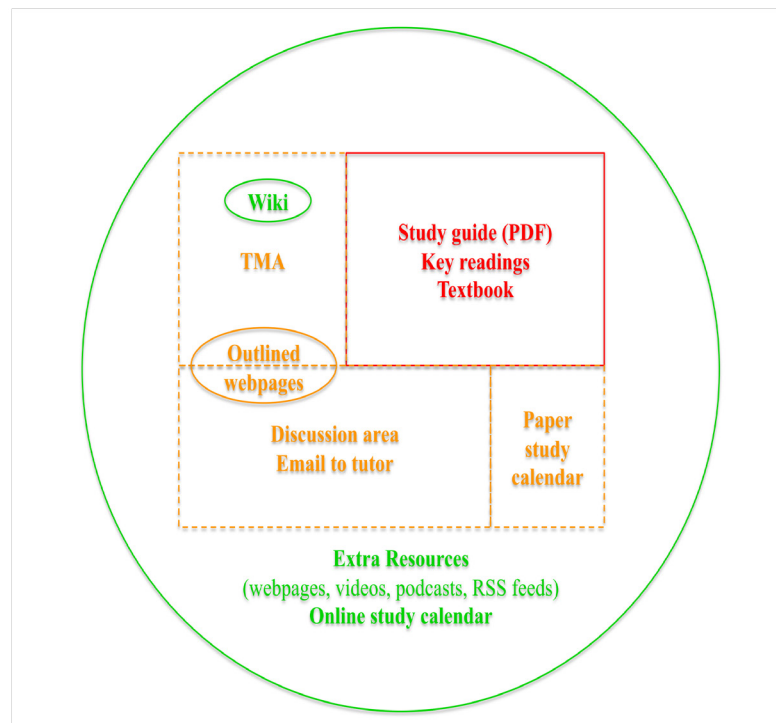


Figure 1. Teaching tools supplied to students and toolbox (red – examinable resources; orange – optional resources but strongly recommended; green – purely optional resources).

Within the general toolbox, the standard core toolbox is represented in red, showing the compulsory and examinable parts of the material. The resources represented in orange are provided to all students by default for all modules, and their use is strongly recommended. These resources are not examined as tutor-marked assignments are assessed but do not count toward the final official module assessment. The resources represented in green rely on a customisation of the virtual learning environment by each tutor. These resources are posted for students to use on a purely voluntary basis.

This traffic-light hierarchy of available resources, or traffic-light toolbox, is thus based on resource examinability, with a corresponding emphasis placed by tutors. This hierarchy has been adopted by the University of London External Programme to help students manage the information load effectively by prioritising what needs to be studied and learned. It is, however, the first time that this module organisation has been formally conceptualised as a traffic-light toolbox system.

So far, most students detail the module’s theoretical knowledge well but fail to step back and use real-life examples to discuss the validity of the theory in their tutor-marked assignments. This occurs despite a requirement to do so, explicit encouragement, and the uploading of extra resources. Evidence from past tutor-marked assignments would suggest that the extra (green) resources remain underused to this point, thereby not leading to “critical learning.” This particular analysis is based on the above framework. This study focuses on

the use students make of the extra resources, represented in green in Figure 1. The use of these extra (green) resources might be limited for two reasons: They are non-examinable and are therefore not considered important by students, or students do not have enough time to look at them.

In such a context, is adding new resources really efficient in terms of learning? Several questions arise from the new online and course formats and form the basis for the questionnaire distributed to students:

1. Do students perceive these extra resources as making their learning more effective?
2. Since only the course file, key readings, and textbook content are examinable, do students actually use the extra resources (beyond the “wow factor”)?
3. Does embedding the additional resources in the online learning environment increase their use for effective learning compared to previous years (web links included in the discussion area exclusively)?
4. Are students focusing on resources specifically outlined in the discussion area (still posted as threads) or do they also look at the more general “embedded” additional resources?
5. Does the material require more explicit built-in linkages (cement) between the different building blocks (course file, key readings, textbook, extra resources, etc.) or do students like having more initiative?
6. Does the study calendar posted online help students keep up with the course content better than in previous years?

These questions should help identify the main reasons behind the (limited) use of extra (green) resources.

Student Survey Design and Results

A survey was designed to answer the above six questions as well as to identify some of the students' characteristics. The student population considered was tutored by the author for three consecutive years (between 2007 and 2009) across two different modules. The two modules are part of two separate degree programmes, potentially attracting different students. These programmes, however, are not completely independent, and students may have taken only one or both modules. This survey relied on voluntary answers from students, with a potential sampling bias arising from the spontaneous answering. The survey questions were designed to be relatively general about the virtual learning environment and module used, with control questions on which and when modules are taken and students' characteristics. Because this survey exclusively targets distance learning students, it focuses only on the online resources provided. This survey could be adapted to assess a

campus-based programme, with the inclusion of lectures and seminars as supplementary teaching tools.

Two hundred and fifty-one students were contacted by email in early August of 2009 and asked to fill in an online semi-structured questionnaire (Bristol Online Survey). Following technical problems, a Word version of the document was also made available later that month, offering students the choice of either filling in the online questionnaire or the Word document. Twenty-five students answered by filling in the online form and 21 filled in the Word document, amounting to 46 answers in total (response rate of 18.33%). Students had similar answers, so the following results sum up the most frequent answers provided to the survey questions. This analysis helps identify the main patterns emerging from the survey. Students did not always answer all questions, hence there are some discrepancies in the total student numbers in the results described below.

Twenty males and 26 females answered the survey, making a relatively balanced sample gender-wise. Twenty-one students are Europeans or based in Europe (7 students in the United Kingdom and 14 in the rest of Europe), 11 are based in Africa, 5 in America (3 in North America), and 3 in Asia. The students' ages ranged from 35–44 (20 students), 25–34 (17 students), 45–54 (6 students), and 55+ (one student). Most of them have family and child-care responsibilities and work outside of normal office hours (respectively, 32, 26, and 35 of the 46 students). Students do take a variety of different modules but all took at least one of the modules tutored by the author.

Students reported using the online learning environment an average of 6.5 hours a month but with great variability (Figure 2). This time presumably does not include the reading of the core examinable material of the course. Forty-eight percent of students log in very regularly, that is once every 1–2 weeks (Figure 3), and 59% of students log in more frequently as the study year progresses (Figure 4). Students using extra resources reported doing so on an irregular basis, approximately every 3 weeks on average (Figure 5).

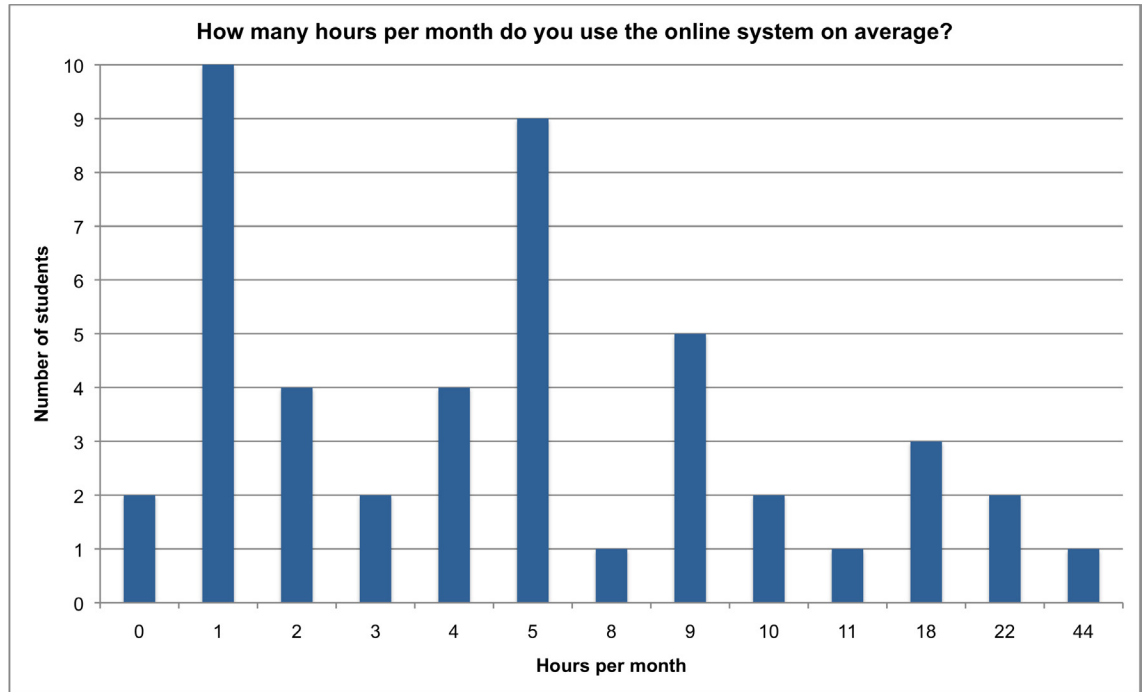


Figure 2. Self-reported time spent by students on the online learning environment.

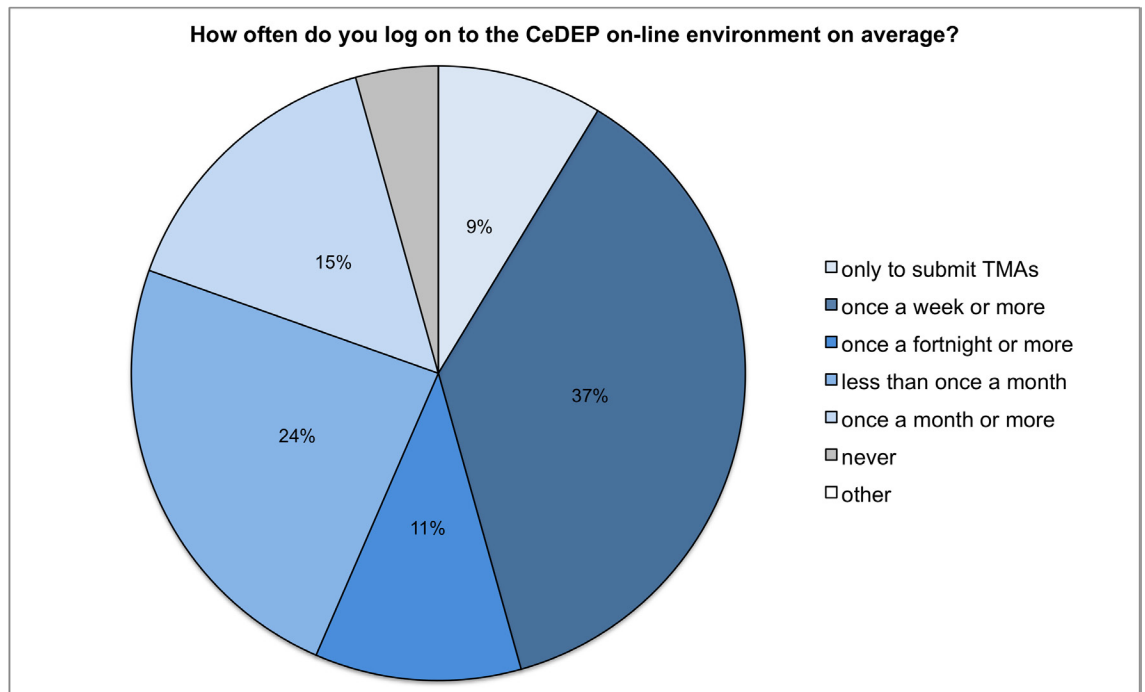


Figure 3. Student use of the online learning environment.

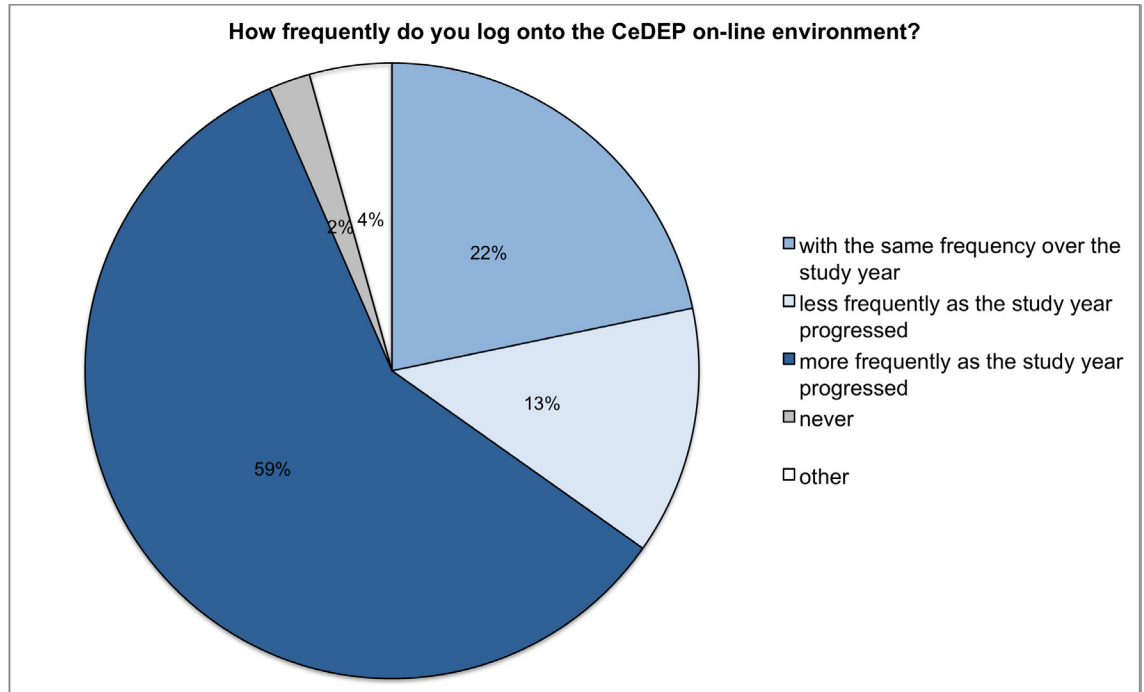


Figure 4. Frequency of student use of the online learning environment over the course of the study year.

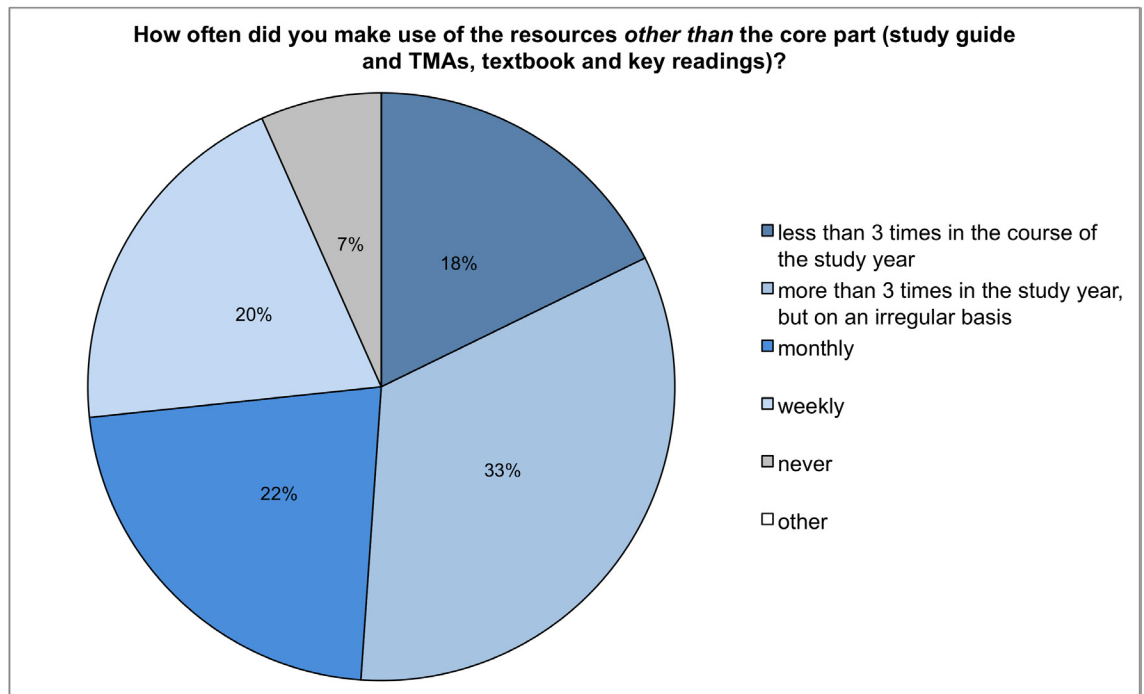
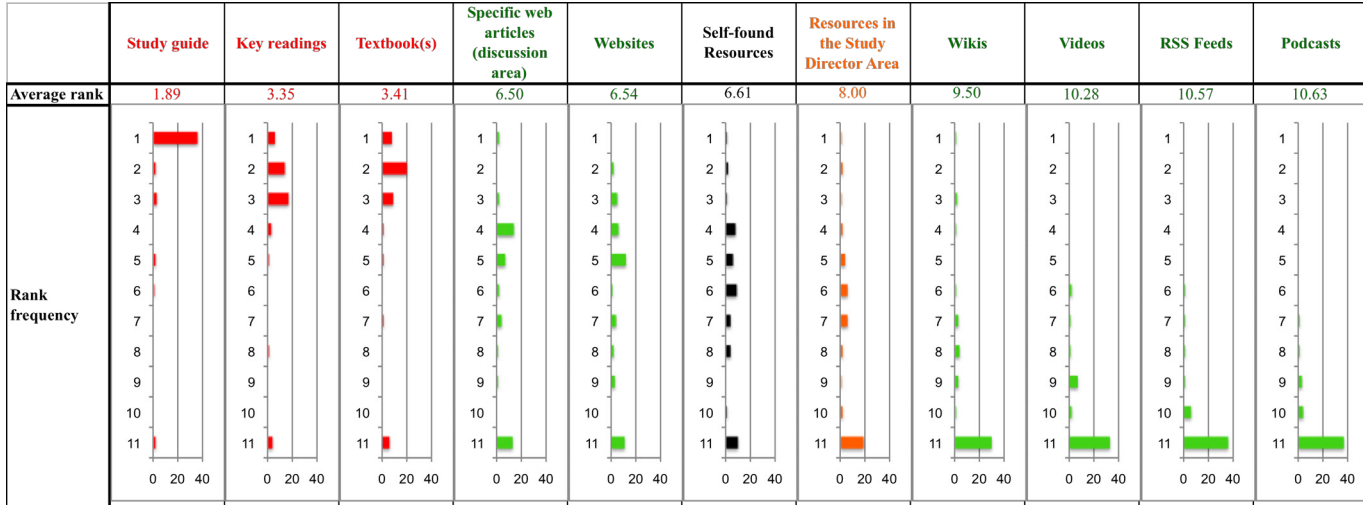


Figure 5. Frequency of student use of extra, non-examinable resources provided.

Table 1

Resource Use, Average Rank, and Rank Frequency



Students reported using the study guide, key readings, and textbook (examinable material) the most, followed by Web sites and self-found resources (i.e., those not pointed out to them by the tutor or found in the course material) (Table 1). The transversal discussion areas (i.e., the non-module-specific Study Director discussion area), wikis, videos, RSS feeds, and podcasts were reported as being used very little (Table 1). The change of online environment did not impact the use of extra resources, with 22 students reporting no change in their use of extra resources. Time (or lack thereof) was outlined explicitly by 13 students as the main constraint for not using extra resources. Work pressures, family situations, and the high number of resources available were specifically mentioned as reasons behind this lack of time. One student working in the field also mentioned a poor Internet connection as a limitation. In the students' comments, extra resources were identified as mostly used to check on a concept or understand it better or as sources of real-life examples to include in tutor-marked assignments.

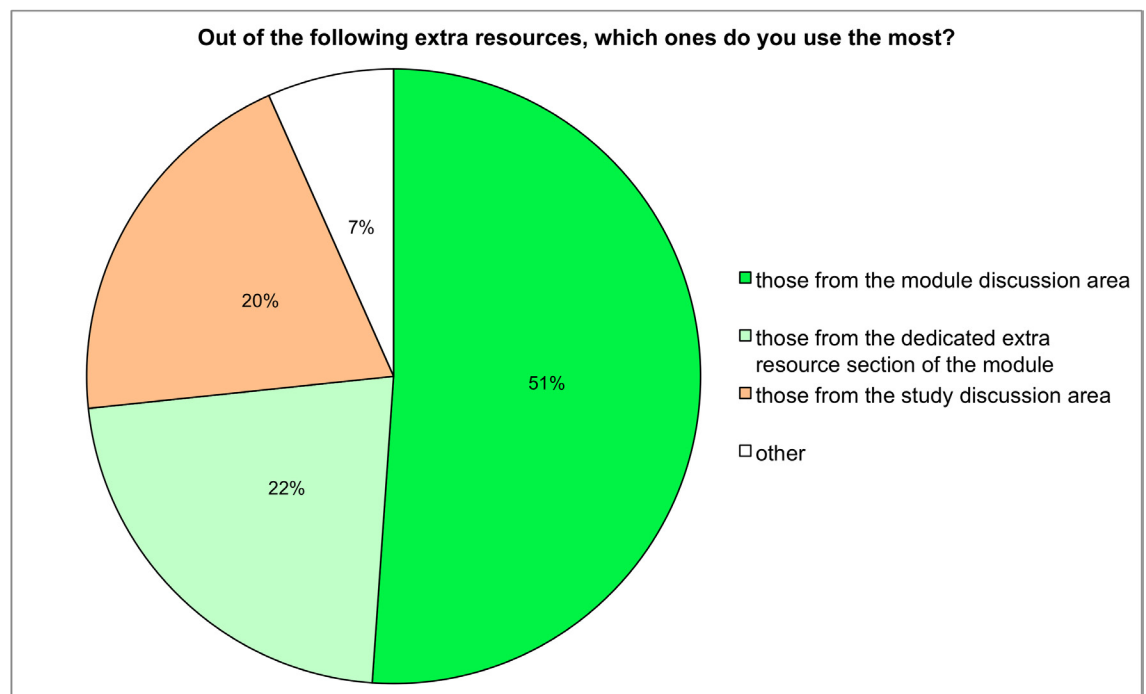


Figure 6. Student use of extra resources depending on their type and location.

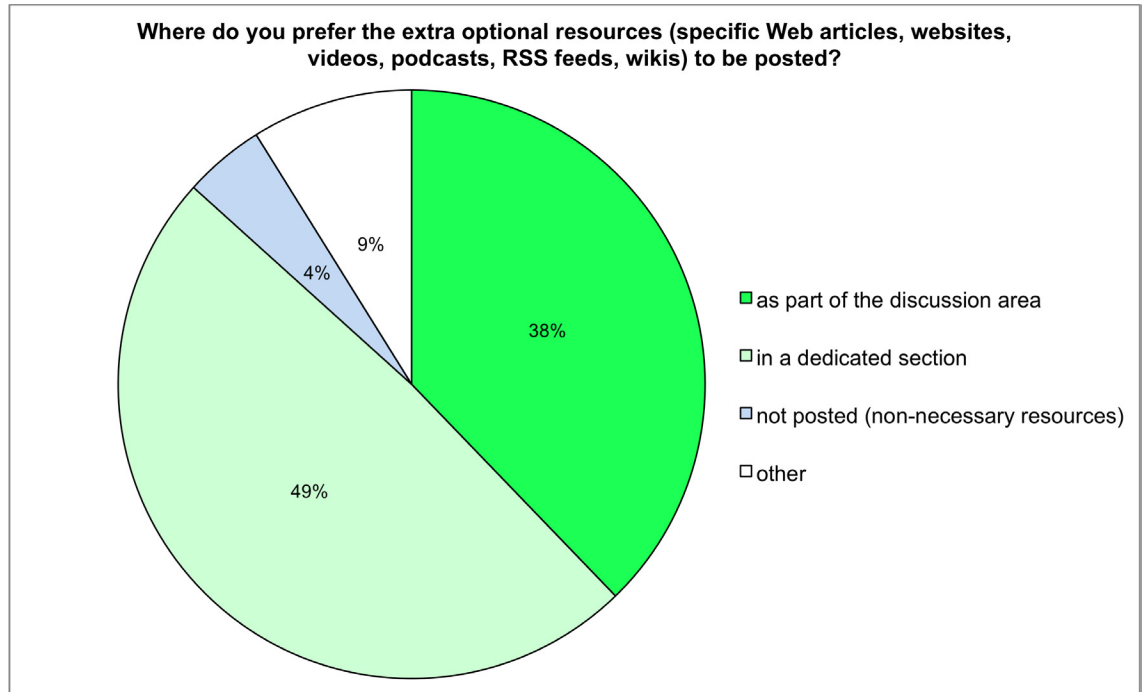


Figure 7. Student preference for extra resource location.

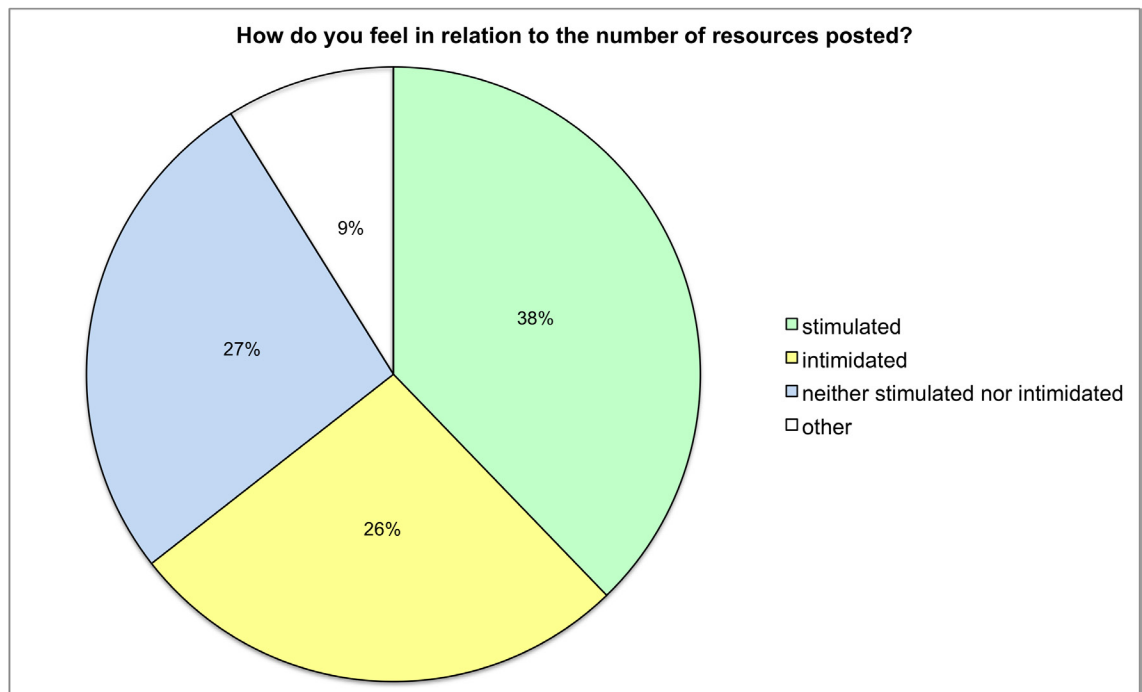


Figure 8. Student feelings about the number of extra resources posted.

Students tend to use extra resources from the module discussion area or e-digests the most (Figure 6) as these resources are more focused, specific, and explicitly linked to the course content. Students seem to prefer extra resources to be posted in separate sections, followed by preferring them to be posted in the discussion area (Figure 7). Students do not wish for more initiative to find extra resources (31 students). In spite of these findings, students

reported overall that they felt stimulated by the number of resources posted (Figure 8). Students also found it easy to link the material together, with the extra resources sufficiently linked to the rest of the material (23 students). Twenty-nine of the 46 students reported having a native language other than English. Despite this, students overall reported a strong preference for resources in English (28 students), followed by resources in different languages but with English as the main language (15 students). Twenty-four of the 46 students reported using the indicative calendar (paper version or online). A majority of students out of those who answered the question reported using the online calendar less frequently than the paper version (9 students). Students also found the online version to be as helpful as the paper one to keep up with the pace of study (16 students). In their comments, students reported using one or the other depending on their personal context, with the online calendar preferred when travelling and the paper version in areas of limited Internet access. Some students also reported not being aware of the existence of the online calendar.

Discussion

Most students seem to have limited time available for learning because of family and/or child-care responsibilities, and/or because they work outside of normal office hours. Also, about half the respondents were based outside Europe and North America and might therefore face limited technological access (e.g., limited Internet coverage or connection, power cuts) despite most students not explicitly reporting this as an issue. These students thus seem to face a relatively strong time constraint. This seems to be the most limiting factor affecting the amount of material covered.

To answer the first question, students perceive the increased material availability (extra resources) as stimulating, which should improve their learning. Because of the low usage of these resources, there is no clear evidence from this analysis that this increased material availability makes student learning more effective overall (possibly marginally). To answer the second question, students seem to be more concerned about making their learning more time-effective than exploring non-examinable resources associated with specific technologies. To answer the third question, the embedded format of the extra resources has not been associated with any reported change in the use of the virtual learning environment. The embedded format of the extra resources does not in itself appear sufficient for increased learning so far. To answer the fourth question, students tend to focus on resources specifically outlined in the discussion area (still posted as threads) rather than the more general embedded additional resources in a dedicated folder. To answer the fifth question, students preferred the status quo option with no more linkages built into the material and requiring no more initiative.

From these answers, what seems to stand out is that because of the strong time constraint, students do not actually use the (non-examinable) extra resources much, unless these resources are made more time-effective. It would thus seem that adding new resources, each with its specific technological tools, does not necessarily enhance student learning other than by increasing student stimulation to study and learn from the course. This finding

would underline the idea that time-constrained students do not necessarily find value in the extra resources and technologies used as such, but rather focus on the examinable core material and well-targeted relevant resources. What might seem a very intuitive finding was, however, not necessarily obvious when starting this study. Indeed, distance learning has been advocated in the literature as loosening the time constraint, especially when compared to face-to-face learning (see Blakelock & Smith, 2006). Replacing face-to-face interaction with distance learning gives more flexibility in the learning space and pace, and distance learning students could endogenously choose this form of learning over face-to-face interaction because they are very time-constrained. Distance learning students have more time to focus on the core knowledge acquisition (i.e., the physical representation of what they have paid for) than they do in a face-to-face setting. The students' total time possibly allocated for studying, however, remains limited, with still too little time to fully exploit the extra opportunities afforded them by technological advances. From this study, it is clear that distance learning modules should be designed to allow the online environment to be used less than one hour a week. This usage mostly includes access to non-examinable "green" or "orange" resources as the core material is also distributed to students to allow off-line use (paper or DVD-ROMs).

The sixth question cannot be fully answered in this paper. Students seem to choose to use one form of the calendar or the other (paper or online) based on pragmatic reasons, with a preference for the paper version. A full comparison between the two forms of the calendar is not possible at this stage, however, because of the very limited data on the online calendar use. Because of the lack of awareness about the online calendar in 2009, more systematic publicity has been provided since 2010. The medium has also been changed (to Google Calendar) to make it easier for students to personalise as the calendar can now be easily imported to each student's SOAS Google email account. It is difficult to assess whether more students are using this version of the calendar, however, because it can be imported without any direct involvement by the tutor. Some students are in school all year long while others concentrate their study time during specific periods of the year, and the indicative study calendar might match all students' needs in this context.

Because students make limited use of the extra resources subject to their own initiative, this could undermine the implicit learning objective of fostering independent study (Beaudoin, 1990). Setting initiative and participation as a module outcome might be irrelevant as such here, however. As most students are already working professionals, they do not need to learn these particular skills to prepare them for their professional life and might be more interested in acquiring knowledge instead. Similarly, students should already know how to filter information to find relevant points and do not need to acquire this skill. The provision of targeted resources allowing them to acquire knowledge most time-effectively might then be their own objective. Ascertaining specific students' objectives for taking up these courses would require further investigation, however.

The current course design seems to be implicitly judged by students as sufficiently suited to their needs, making additional resources superfluous. The limited use of non-examinable resources could also be linked to their non-examinability. However, because of the strong

time constraint students are facing, making non-examinable resources examinable might not increase students' learning and might even have an adverse effect on their motivation to study. It could also increase the number of students deferring their exams to the following year to have more time to cover the increased amount of examinable material. A change in the current toolbox organisation (with the addition of more examinable "red" tools) would thus not necessarily lead to increased learning.

Conclusion

The push by technologists for the greater use of teaching technologies has clearly helped to extend the teaching toolbox. One associated danger is that it could dilute students' efforts and focus away from the core knowledge or skills to be learned. This could also, for already time-constrained students, reduce the actual study time by increasing the time needed to find or identify relevant information. This paper developed a conceptual framework for information load management to identify the main factors underlying students' use of learning resources. The module has been conceptualised as a toolbox of different teaching and learning resources (each associated with specific technologies). The focus of this analysis has been placed on students' use of the different tools, specifically the non-examinable (optional) material. This led to an assessment of whether the opportunities provided to students—in terms of "extending the toolbox" through the provision of extra resources—were actually taken.

This study has shown that the increased availability of extra resources associated with technological developments has not been sufficient to increase any self-reported use of these extra resources by students. This study has thus highlighted the need to take into account both the supply of resources and technologies as well as students' needs and demands. If not, the danger is that these resources will not be used even on a voluntary basis by students and will therefore not achieve their potential for delivering effective learning.

This study also highlighted that students tend to focus primarily on the examinable material because of the time constraint limiting the amount of material they can cover within a study year. This study strategy would allow distance learning students who are already working full time and who have family duties to maximise their studying and learning time-effectiveness. This would confirm what the Distance Learning Programme staff members have observed over the years.

This study clearly outlines the need to make the distance teaching toolbox more time-efficient for students to use (i.e., in relation to their needs and not just based on the technology supply). This might be the best strategy to actually enhance learning rather than just extending the toolbox or increasing the core examinable material. Students' time constraints as well as technology accessibility clearly influenced the module design discussed in this paper, with an encouraged but voluntary use of extra resources. The current approach, identifying formally assessed core material to be covered, would seem to help students prioritise their studying efforts, thus potentially making their learning more effective. This might

be the most suitable approach in this context as it gives students the flexibility to look for information by themselves while providing a good, already quite time-demanding, minimum basis to be covered compulsorily.

The main implication for this study is that universities should focus on providing opportunities for learning to their students but take into account the personal and/or professional constraints faced by those students. The construction of learning toolboxes rather than individual tools could be a way to deliver actual and effective student-centred blended learning. This is especially important as time constraints placed on both distance and face-to-face students are likely to increase. The framework described in this paper could help design and organise module content in relation to the targeted student population. This study also underlines that non-examinable resources provided to students on the online environment should be limited to what can be covered in less than an hour a week.

Further research could look into the virtual learning environment design as a critical factor in making the finding of information and resources more time-efficient. A change in the relative balance of core examinable and optional resources could also be considered for the same amount of material feasibly covered by distance learning students. The core part being quite time-demanding already, reducing it could lead students to use their own initiative and browse extra resources more frequently. This would, however, go back to the debate about what students are actually paying for (i.e., studying material or studying opportunities) and how inclusive (e.g., for students with technologically constrained access) we want the teaching and learning to be.

Acknowledgements

I am very grateful to the editor and the two anonymous reviewers for their helpful comments on previous versions. I also thank Laurie Smith and Andrew Dorward at SOAS for allowing me to conduct this research and for their very valuable comments on the survey design. I also thank Martin Gough (University of Kent) for his feedback and constructive comments. I would also like to thank all the students who took some of their limited time to answer the survey.

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Athabasca University 



Book Review - The Perfect Online Course: Best Practices for Designing and Teaching



Editors: Orellana, A., Hudgins, T. L., & Simonson, M. (2009).
Charlotte, NC: IAP – Information Age Publishing, Inc.
ISBN: 978-1-60752-120-4.

Reviewer: Marta Ruiz-Corbella, Universidad Nacional de Educación a Distancia (UNED), Spain

Presenting a book on the perfect online course might seem a little pretentious. The editors are well aware that there is no such thing as the perfect course, despite stating it in the title. They are not trying to hoodwink the reader with foolproof formulas, and they say so. They admit that the perfect online course is “a pipe dream” (p. 10), but they also argue that it is possible to get close to this perfection. This is the starting point for an understanding of the book’s content, its structure, the choice of topics and research work presented, and the valuable contributions made by experts, all of which contribute to the diversity and wealth of content to be found by the reader.

The first thing the editors make clear is that for an online course to be excellent, it must follow a design guided by quality standards. Only then can we talk about a good online course. But why is this book interesting and timely? We could argue that it is merely one more text published in response to the trend toward delivering online courses. Certainly, the surge in e-learning cannot be ignored. But this is more than just a craze; we are seeing an overwhelming change that is shaking up all institutions involved in training. The massive impact of information and communication technology has brought radical change to education, opening up new possibilities and platforms for every imaginable course design. A telling fact is that within the past five years, all universities have started to offer part of their courses and/or study programmes online (p. 327). Faced with this transformation of learning environments, the authors first reflect on what an online training course design is, what it really involves, and then collect experiences and examples of good practices for those elements that are present in all designs.

Of course, they do not set out to provide a design that is valid for every course as this would be a contradiction. While acknowledging the limitations of a book, what they do propose is to analyse key emerging issues in distance learning and in the design of quality online programmes and courses.

The second point the editors stress is that when we are talking about good practice in designing distance learning and/or online courses, it is vital to clarify exactly what each of them is (p. x), although both terms are used indiscriminately throughout the book. This makes clear that course design for distance or online learning is radically different from that for face-to-face learning. The editors emphasise that distance learning is a methodology in which all components must be designed to achieve their objectives, taking into account the environment and context in which it takes place. (p. 5). This principle, although it may appear obvious, is forgotten in many teaching courses, and this invariably leads to failure. This omission is particularly common in educational experiences based on the increased use of technology. Nobody questions the fact that ICT has revolutionised the design of distance learning courses, demanding decisions that fit in with this methodology and particularly with the objectives to be achieved and the context in which they are to be implemented. Technology has been responsible for generating the surge in online courses, and many institutions see this methodology as the future of training—and of their business. However, as this book makes clear, technology in itself does not guarantee better learning (p. 90). Technology should be at the service of distance learning; it should suit the course objectives, the context in which it is being delivered, the target group, and so on. In this vein, the editors insist throughout the book that there is no such thing as a “one size fits all” online training design model and that the perfect course does not exist. What we can determine are key rules that help us to reflect and take our own decisions: the design should suit the institution’s own needs and capabilities, and those of the target students; the number of students a course is designed for will affect decisions made about methodology; the technology should be adapted to serve programme objectives and not the other way around; there are no such things as super-technologies, in that all technologies have their pros and cons; the very latest technology is not necessarily better than existing technology; and so on.

The book is organised into four sections. The first focuses on the main features involved in the design of any distance and/or online teaching programme. These issues may seem obvious, but they need to be emphasised repeatedly. This is one of the book’s great contributions as it draws together and sets out the basic content for distance learning methodology, without which an online course cannot be understood. Many other studies discuss good practice, online course design, etc., without having first clarified the specific methodology their discussion is based on. This makes it difficult to evaluate what is being put forward or the reason behind each of the methodological decisions taken and even more difficult to transfer it to other contexts. It is worth reading the two chapters in this section carefully as they provide the reader with key and thought-provoking ideas for approaching the design of any online training course.

The second section is comprised of a selection of case studies and research on the best

procedural standards and guidelines. It deals with a diverse range of contexts, topics, and content, with each chapter contributing data, ideas, and experiences that are bound to be of interest. This varied approach enables readers to pick the chapters that interest them most, according to their needs and preferences. However, it would have been more helpful if real-life experience had been highlighted more than research data. The former describe situations from which to learn. The latter, however interesting, do not always focus on the elements of teaching design that are most in demand and, as the authors themselves point out, are not always widely applicable, making them less useful. It would have been much better to pay closer attention to research outcomes that could be applied to other contexts.

The same can be said for the third and fourth sections, which describe the best models, methods, and teaching strategies. Both tackle different teaching design models, and advantages and drawbacks are compared. Once a model has been chosen, and depending on the context in which online training is to be delivered, a suitable matrix of technology for achieving the course objectives has to be selected. This seems obvious but is in fact one of the most common errors made in any design: not knowing what teaching design is being followed and what each of the decisions demands. The editors are quite right to stress this issue.

Another issue they highlight is assessment, a key part of any training process. Assessment must be logically coherent with respect to all the elements involved in the design and must be applied throughout the whole process, using a range of strategies (p. 312). No type of assessment can be understood without students being given ongoing feedback, enabling them to manage their learning. In this section, it is striking that the editors touch on an issue of great concern to the teaching profession, one that is not tackled often enough in texts of this kind. I am referring to the problem of student dishonesty and the possible fraud that can be committed using this mode of learning. Dishonesty is not a new problem in education, and distance learning is no exception. Indeed, some authors are convinced that the lack of personal contact with students makes fraud much easier. However, the author of this chapter argues (p. 327) that in the majority of cases this issue is not implicit in the methodology but is due to poorly produced or badly monitored course design. He puts forward a series of basic ideas to be applied to any teaching process: coherent teaching design, clear instructions, ongoing interaction with students, setting up continuous assessment in line with course objectives and content, clear feedback, etc., all aimed at reducing the frequency of these dishonest situations. He also argues that we should not be naive and we should be familiar with and know how to use computer software that can detect plagiarism. But, although we should be aware that fraud exists, our top priority is to help students to organise their studies as not all of them want or know how to self-manage their learning process (p. 425). It is not a question of teachers taking on the role of prosecutors of dishonesty but of analysing our course design to find the weak spots that may cause stress in students.

Another promising area tackled by the authors, and one to which teachers and managers do not give sufficient thought, is that when we talk about distance education we are talking about distance teaching and learning. This means that teachers' actions are radically different because they are mostly going to be working with courses that they have not designed

themselves, handling tools not chosen by them and carrying out processes that they have not specified. On this point, the authors once again stress the importance of teamwork in designing any online course as there are so many different specialists involved that the whole process is very complex.

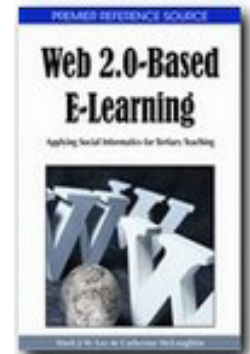
Another factor is that students are learning at a distance and not all of them are well prepared for the experience. This is why it is vital to work with these students beforehand, as mentioned earlier, or determine at what point we can insist on the importance of self-managed learning and personal responsibility (p. 179). Both of these inevitably entail ongoing interaction between teacher and student/s, the need for technical support, accessible and updated course design in which all the material is available from the outset, being able to read and write in different environments, the ability to search for information, computing skills, etc., without which a distance learning process is unlikely to be successful.

In conclusion, and in the words of the editors, “the perfect online course is a pipe dream . . . so let us be more realistic (and legal). The key to an effective course is the direct, purposeful involvement of a knowledgeable teacher; one with content knowledge, teaching skills and design experience” (p. 550). The effort expended in selecting and compiling the texts included here reflects how vitally important it is that a teacher or manager interested in creating a distance training course has access to the basic content required to design it with some guarantee of quality.

Athabasca University 



Book Review - Web 2.0-Based E-Learning: Applying Social Informatics to Tertiary Teaching



Authors: Mark J. W. Lee and Catherine McLoughlin (2011)
Hershey, PA: IGI Global. 483 pp.
ISBN 978-1-60566-294-7

Reviewer: Juan Leon, Thomas Jefferson University School of Population Health, USA

This timely collection of articles will help teachers in higher education explore the implications and applications of social software tools for web-enabled courses and programs. The collection is particularly valuable for its broad scope, including chapters ranging from podcasting to the design of personal learning environments, and for its success in complementing theoretical perspectives with detailed accounts of evidence-based practice. The early chapters in this collection address contemporary learning theories on web-based instruction, prompting the reader to reflect on the type of paradigm shift Web 2.0 may represent for teaching and learning. These chapters are followed by a series of case studies that comprise the largest section of the book. The case studies provide numerous examples of best practices and action research. The final section of *Web 2.0-Based E-Learning* looks to future directions in web-based education and takes into account Web 2.0's potential impact on professional development plans for academic staff.

The complementarity of the theoretical and applied aspects of the book's contents emerges in part through the shared themes of participation, personalization, and productivity, the "three P's," articulated by the book's editors in their chapter on Pedagogy 2.0. Mark Lee and Catherine McLoughlin, faculty at the schools of education at Charles Sturt and Australian Catholic University, respectively, draw upon their extensive research in pedagogical uses of Web 2.0 technologies and learner-generated content to propose a pedagogical framework responsive to the needs of today's learners and the affordances of social software tools promoting networked communities of learning. The three P's framework promotes learner agency and choice, and it foregrounds learner-created content. Key elements of participa-

tion include collaboration and community. Personalization encompasses both customization of content and learner self-regulation and management. Productivity extends to the learners' contributions to knowledge. The elements of Pedagogy 2.0 (I've presented an abbreviated list here) derive from a clear and compelling vision of what is essential in education:

True educational value arguably lies in the enablement of personalized learning experiences that empower students to take charge of their learning journeys, collaborating with peers and experts and drawing on multiple sources both within and outside of the formal learning environment to produce their own ideas, content, and resources. (p. 50)

This statement about true educational value—one could almost call it an ethic or credo—underlies the three P's framework. It also voices more general themes that integrate the theoretical and applied content throughout the book.

The first section of *Web 2.0-Based E-Learning* traces the evolution of computer-mediated communication through to our present-day emergence into a new, collaborative pedagogical ecology, a present-day shift that has implications for the design of instructional materials, training in the workplace, and the measurement of learning outcomes. This section concludes by considering the newly prominent role of learner-generated content and forward-looking experiments in the construction of personal learning environments.

The case studies of the second section of the book enrich the more theoretical discussion and pedagogical models of the first section in a number of ways. Readers may find it illuminating, for example, to reflect back on the chapter about personal learning environments having read the insightful discussion of personal knowledge management (PKM) presented in chapter six. The analysis of PKM competencies ("Personal Knowledge Management Skills in Web 2.0-Based Learning") reminds us that personal learning environments can't build themselves. Students will need deliberate guidance as they develop the personal knowledge management competencies that will enable them to construct these environments for themselves. Other topics in this application-oriented section of the book include the use of Web 2.0 tools for creating authentic learning environments, multiple uses for blogs and wikis, and the distinctive affordance of mobile technologies.

Of special value is an idea-inspiring, practical how-to chapter on podcasting. The chapter's literature review highlights innovative podcasting practices around the globe and lists the unique benefits of podcasting for distance learning. Four categories of benefits are identified: increasing motivation, improving outcomes, extending access, and building community. Of special value to lesson designers will be the figure depicting 10 dimensions of planning for educational podcasting (p. 237). Also notable is the chapter on using Web 2.0 tools to support libraries, student services, and other non-teaching areas that contribute to learning and student satisfaction, an often-overlooked part of Web 2.0's potential for

educational organizations.

The case study section is rounded out with an account of using Facebook to enhance student learning and an important critique of the concept of “digital natives” as applied in education contexts. In addition, two chapters delineate fault lines created by the shifting ground of online learning today. In chapter 14, Henk Huijser and Michael Sankey of the University of Southern Queensland question whether an institutionally controlled and centrally administered learning management system can be reconciled with Web 2.0 functionality and ethos. Secondly, Denise Whitelock of the Open University challenges us to imagine assessment strategies and tools that would more fully align with Web 2.0–based pedagogy, offering several practical approaches for moving us in the right direction. Anyone not already familiar with Bobby Elliott’s 10 characteristics of Assessment 2.0 assessment activities, authentic, personalized, negotiated, and more, will find a convenient listing here (p. 325).

The forward viewpoint explicitly adopted for the book’s final section draws the authors of these concluding chapters to reflect on how knowledge will be defined, created, and shared in a world transformed by social technologies. Topics include postmodern epistemic learning spaces and the constructive use of metaphors for making sense of a complex and changing educational landscape. A tentative look at what Web 3.0 could entail takes account of the influence of cloud computing, the Semantic Web, and the increasing use of three-dimensional imagery, and a sobering chapter contributed by Belinda Tynan and Cameron Barnes of the University of New England, Australia, identifies ways in which traditional institutions and traditional teaching staff must develop if the potential of Web 2.0 for learning is to be more fully realized.

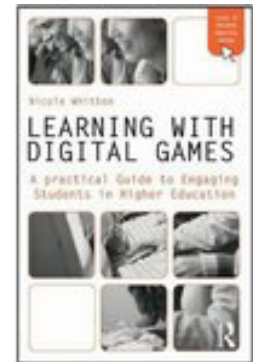
The breadth and depth of coverage offered by *Web 2.0-Based E-Learning* will make it an excellent addition to a reference collection, while the volume’s structure will make it a highly readable companion for advanced courses in online education. Readers will come away with a detailed snapshot of the state of the art in adapting social technologies for instructional purposes, and researchers will appreciate the thorough literature reviews that are part of each article as well as the convenient compilation of references placed in the back matter.

Some readers may want to supplement this book in two areas. First, the chapters of *Web 2.0-Based E-Learning* are written almost exclusively by English-speaking authors, and the case studies are grounded almost entirely in English-speaking environments. One is left wondering how the three P’s of participation, personalization, and productivity may be inflected in other cultural contexts, or how mobile computing in Asia or Africa could be resequencing patterns of the evolution of learning technologies seen elsewhere. Secondly, research in the application of social technologies for tertiary teaching could benefit going forward by taking into account the implications of Web 2.0 tools and values on the producers of courses themselves—course authors. While course authors remain present implicitly in contemporary discussions, today’s discussions do little to change the model of the independent, even isolated, course author. We need a “three P’s” for faculty developing courses in a Web 2.0 world. A companion volume to *Web 2.0-Based E-Learning* addressing how

Web 2.0 tools can facilitate the collaborative design and development of courses and learning environments by faculty teams, students, and other contributors would be a welcome start.*

*An example of this kind of renewal of attention for the design/authoring process is *Mind-Meld: Micro-Collaboration Between eLearning Designers and Instructor Experts*. Jon D. Aleckson and Penny Ralston-Berg. Madison, WI: Atwood Publishing, 2011.

Book Review - Learning with Digital Games: A Practical Guide to Engaging Students In Higher Education



Author: Whitton, N. (2010).
New York and London: Routledge.
ISBN 987-0-415-99775-1

Reviewer: Maja Pivec, FH Joanneum University of Applied Sciences, Graz, Austria

Introduction

In the past decade digital games have increasingly drawn notice as an interesting research topic; consequently, games have also begun to find acceptance as an interactive and immersive learning environment. However, although many educators would be willing to introduce digital games in their classes (Games in Schools, 2008, European SchoolNet), many of them have not had exposure to this environment. Recently there have been increased efforts to provide resources and support for teachers in the form of workshops for using digital games within the classroom (www.engagelearning.eu). The book presented for review here offers a quick and effective guide for beginners on how to become acquainted with digital games and on what to consider when using them for learning in higher education.

Nicola Whitton is a Research Fellow in the Education and Social Research Institute at Manchester Metropolitan University. She has recently completed her PhD thesis, entitled *An Investigation into the Potential of Collaborative Computer Game-Based Learning in Higher Education*. Her recent background has been in computing, human-computer interaction, and e-learning. More detail can be found on her Web site at <http://playthinklearn.net/>.

Whitton aimed this book at anyone with an interest in games and education, including lecturers, educational developers, e-learning practitioners, and researchers. The book is based on her research for a doctoral thesis and includes her research experience and lessons learned, along with accompanying practical activities.

Organization/Structure

The book contains 12 chapters, divided into three parts: Theory, Practice, and Technology. In the introductory chapter the author explains the structure of the book along with its background and how it fits into the higher education context.

Supporting materials to the book can be found at the Web site for Learning with Digital Games at <http://digitalgames.playthinklearn.net/> and are presented in five sections. In the *Supporting material* section of the Web site, for each chapter in the book there is a collection of links to all of the resources and a list of additional readings, activities, and checklists that are provided in the chapter. In the *Games* section, links to all addressed games and examples are provided, along with a collection of additional games that may be of interest. In *Resources*, links are listed to additional publications, development tools, and some topic-related Web sites. *Case studies* that are provided in the book are also available online. *Feedback* contains the electronic and snail mail contact details of the author with an invitation to share with her your thoughts on the book.

Early in the book (pp. 12–15), the first hands-on experience for the reader is offered. For easier understanding and discussion of various points that she wants to raise, Whitton presents three examples of the different types of games that are addressed throughout the book. She first presents a brief description of selected games and then by means of a proposed activity invites the reader to “break the ice” by simply trying out each game.

In *Part I – Theory*, the author tackles characteristics of digital games, how these characteristics support learning, and ways to define digital games. From a practitioner’s point of view, it is important to understand the pedagogy of digital games and how these relate to learning theories and how to identify types of digital games for learning. The author addresses these topics with competence gained through her experience in e-learning. For those interested in more detailed and comprehensive information on definitions and different types of games, I suggest looking for additional reading.

Part II – Practice contains chapters on integrating digital games into the curriculum, designing a digital game for learning, and assessing the impact of digital games on learning. An important part of integration of games for learning is considering learning needs and other variables, including technical and organisational constraints. This point is well addressed at the beginning of Part II, accompanied by the exercise “Undertaking a Contextual Analysis” (p. 82). As a reflection, a comparison of face-to-face and online gaming is offered, along with a discussion of six different models of integration of games. For those practitioners who cannot find appropriate off-the-shelf games, further chapters provide support in developing their own resources, including digital games and reflections on how to align learning objectives with game play and advice on which types of activities may enable collaboration and can be added to the game concept. In the last chapter of Part II the author looks at how games may be formally assessed and appropriate ways to undertake assessment. Although Whitton also addresses research in the area of student immersion and provides a questionnaire to evaluate the level of engagement with different activities

(p. 112), for thorough research work in this area as well as detailed assessment of game play, immersion, and engagement, I would suggest using the assessment matrix from Sweetser and Wyeth (2005).

Part III – Technology begins by addressing the application of different types of existing games to learning. Whitton suggests sites where specific games that meet your game concept specifications may be found. The next chapter discusses how to develop new digital games for learning, the skills that are needed, and how to make sure your game is balanced, and explores various development tools. In the chapter “Evaluating Digital Games for Learning,” the author stresses the importance of user-centred design and early involvement and feedback from your target group. As the game should support learning, one needs to make sure that it is easy to use, that the use and handling is consistent, and above all that the game is accessible.

In our role as teachers, the experience and examples our colleagues report about often inspire and encourage us. For that reason the chapter on case studies in the Technology section is valuable. With five examples, it illustrates different possibilities for successful application of games. At the same time, it gives us hints and ideas as to what needs special attention in the planning and experimentation phase. A good example is presented in the case study “PeaceMaker,” by Chris Goldsmith and Richard Hall from De Montfort University (p. 174), or online at <http://digitalgames.playthinklearn.net/cs3.htm>, in which they describe including an off-the-shelf product as part of their course module “Ethics and International Relations in the Middle East,” with the aim of creating a better learning opportunity for conflict resolution and intercultural competencies.

In her concluding chapter, the author summarises the main ideas of the book, suggests topics for further research, and addresses the challenges of learning with digital games.

This book is appropriate for practitioners, that is teachers who want to introduce digital games to enhance learning and teaching with adult learners. It can also be recommended as reading for beginners unacquainted with digital games. It provides activities that guide reflection with regard to one’s own educational settings. With different examples and activities it will help teachers to detect both opportunities and constraints for the practical application of games in their teaching.

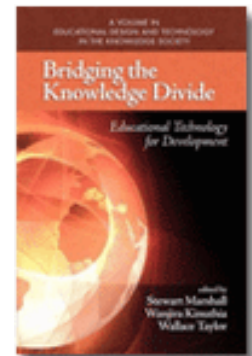
Reference

Sweetser, P. M., & Wyeth, P. (2005) GameFlow: A model for evaluating player enjoyment in games. *ACM Computers in Entertainment*, 3(3), 1–24.

Athabasca University 



Book Review - Bridging the Knowledge Divide: Educational Technology for Development



Editors: Marshall, S., Kinuthia, W., & Taylor, W. (2009).
Charlotte, NC: Information Age Publishing. 433 pages.
ISBN 978-1-60752-109-9.

Reviewer: Aminudin Zuhairi, Universitas Terbuka, Indonesia

Addressing the challenge of bridging the knowledge divide through the use of educational technology, this book is organized around four main themes: empowerment, knowledge, flexible delivery, and teacher preparation. Contributors to the discussion of these themes raise strong alarms about the potential pitfalls of the shift from a digital divide to a knowledge divide, calling for planned action. Drawing on their experience with education technology and distance education policy, theory, practice, and implementation in different societal and cultural contexts, in both developed and developing countries, some 40 contributors present roadmaps and strategies for planning and implementing educational technology that can bridge the knowledge divide.

Opinions about the knowledge divide differ widely, with pessimists perceiving the knowledge divide growing wider. On the other hand, optimists, such as the book's editors and contributors, share a common view that the knowledge divide can be bridged through establishment of technology literacy and effective use of technology. Indeed, the main aim of the book is to show "how educational technology can utilize ICT to transform education and to assist developing communities in closing the knowledge divide" (p. xxviii).

The book offers theoretical and philosophical insights, presents benchmarks and best practices, and analyses research results that inform readers and decision makers about actions that can address the issues involved in bridging the knowledge divide. Case studies provide both broad overviews and specific instances from which readers can learn what approaches and actions may be taken to bridge the knowledge gap. Chapter authors present evidence from developed and developing country contexts to support the conclusion that governments and societies can bridge the knowledge media gap through effective uses of

technology for development. Arguments are well supported with statistical data, facts, and research findings from a wide variety of social and cultural contexts.

Following the book's introduction, four sections, comprising 23 chapters, address issues that pertain to flexible education for empowerment, managing and communicating knowledge, flexible delivery in higher education, and preparation of teachers using flexible approaches. Despite conflicting views as to whether advances in knowledge benefit different societies and cultures fairly, there is growing acceptance of the perception that all societies will eventually become knowledge societies. Chapters on flexible education for empowerment cover issues related to community development, community economic development, gender, empowerment of women, enablers and constraints of ICTs in higher education, and civil service training. Chapters on managing and communicating knowledge address issues related to knowledge management strategies; the effectiveness of mobile technology; and the impact of video conferencing, open resources, open source software, and copyright issues. Chapters on flexible delivery in higher education discuss national development, policy considerations, blended online and face-to-face learning, cognitive-based learning, shifts from distance to e-learning, cross-regional delivery, and postgraduate medical education. Chapters on teacher preparation using flexible approaches address issues related to pre-service teacher preparation using e-learning, costs of distance teacher training, computer technology for e-learners, use of educational technology, and digital literacy of primary teachers.

An abundance of insights, examples, and good practices, one of the book's major strengths, can inspire educational theorists, researchers, policy makers, and practitioners as they construct and implement new approaches to confront the challenge in their own contexts. The book presents concise and comprehensive analyses of actions addressing knowledge for development worldwide. It will not only serve as good reference material but also enrich the literature of distance education theory, research, and practice.

There is no doubt that we can learn a great deal from this book. In his Foreword, Sir John Daniel of the Commonwealth of Learning states that the book "will help to bridge the knowledge divide, an essential task in bringing closer together the extraordinary extremes of this world in which we live" (p. xi). Confronted with the paradox of the knowledge divide, educators must find ways of addressing this challenge through integration of ICT in "the development, delivery, and content of education" (p. xxvii). Reading this book will trigger awareness of barriers to equitable distribution of traditional forms of educational services. "Developing countries should therefore seek to adopt as far as possible the tools for effective delivery of these alternative forms of education" (p. 17). New technological development helps societies to advance equitably. Although "open source communities do not equate to ideal societies" (p. 197), there seems to be growing acknowledgement that open source can promote equitable access to technology.

Because of its systematic and comprehensive approaches to the challenges of bridging the knowledge divide, this book is not to be missed. It will be of great value to readers involved in exploring new theories and approaches and implementing new strategies and effective

practices in open and distance learning. Readers will gain better and deeper understanding of the issues related to the knowledge divide and insights into new approaches and strategies. The book can thus point us toward the necessary steps in our common efforts to bridge the knowledge divide and foster human development.

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