INTERNATIONAL JOURNAL OF INSTRUCTIONAL TECHNOLOGY AND DISTANCE LEARNING

February 2007
Volume 4 Number 2

ISSN 1550-6908

PUBLISHER'S DECLARATION

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

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International Journal of
Instructional Technology & Distance Learning

Vol. 4. No. 2.

ISSN 1550-6908

Table of Contents – February 2007

Editorial

Enhancement of Learning

Modern communication media offer abundant opportunities for learning.

Newspapers such as the New York Times and the Wall Street Journal give news “in depth”. Weekly magazines distill, analyze and comment on world events. Books provide resources and recreation. CDs deliver voice, music and computer programs. Radio brings listening enjoyment and current events enriched with multimedia web pages. Films and television mix fact and fiction and transport you through time and space to other worlds. The internet facilitates interaction with seemingly infinite resources for exploration and participation, games and simulations. It has simple production tools that enable almost anybody to create web pages with text, graphics, animations, sounds, and video.

With such fantastic resources for communication and learning, why does anybody fail in school? Is failure due to the school, the teacher, the student, distraction of the entertainment media, or …? Do causes go deeper, to educational planners, curriculum and instructional designers, administrators and legislators? Or is it, to use the idiom of educational testing, “All of These” or “None of These”.

Instructional design is based on models like “ADDIE” – Assess, Design, Develop, Implement, and Evaluate. Jerry Kemp told us 40 years ago that evaluation data from each iteration can be used to improve the next iteration. If this is true, courses that have been around for a long time should be perfect. Learning should be relevant, fast, and easy. But is learning improved by instructional design? Except in a few areas, the result is, “NO SIGNIFICANT DIFFERENCE”.

Maybe it is methodology. Bruce Joyce et. al. in Models of Teaching provide tools for Mastery Learning based on inquiry, constructing knowledge, concept formation, inductive thinking, inquiry training, advance organizers,, memorization, group investigation, role play, learning styles, models of teaching, and conditions of learning. This is the basis of “methods” courses in schools of education. Yet standardized test scores remain the same.

How about technology? It provides powerful systems for diagnosis and prescription, delivery and interaction, evaluation and course management. With technology we can perfect presentations and distribute them to millions. Learning can be interactive, individualized and customized to specific learning needs. Customization is facilitated by use of Learning Objects. Learning can be mobile and accessed anywhere, anytime by anybody. Research results find interactive multimedia and distance learning to be as good or better than traditional learning?

Is there a problem with the blueprint for learning? Do we have clear and relevant goals and objectives? Are goals and objectives stated as observable and measurable performance outcomes and criteria? Supposedly this was implemented for K-12 in U.S. schools around the year 2000 when they adopted the new Standards-based Curriculum, but did it improve standardized test scores? No!

Is the problem with students? In a world of competing distractions, the promises of education grow dim and unattractive compared to television, computer games, and gang activities. Our “same-size-fits-all” educational system for the masses does not adequately provide for differences in ability, experience, opportunity, culture, learning styles, and personal needs. For many students, schools are boring and irrelevant, excessive in controlling and often punitive.

How do we make content relevant? Museums house artifacts of past societies and worlds. They create exhibits and hands on experiences to win public interest and participation. Planetariums,

aquariums, art galleries, aerospace museums, national parks and historic landmarks followed suit. The Exploratorium became the ultimate interactive environment, and it is now challenged by video games and computer simulations. Can these excellent resources, along with the products of public television, be integrated into school curricula to make learning more relevant and exciting?

Academe has responded to economic pressures by adding professional level programs and courses. Education is expensive, and graduates must command jobs with salaries that will justify the investment. More students are attending colleges and universities, but the down side is a high dropout rate and an increasing number of graduates deficient in language skills and mathematics.

Perhaps the evaluation tools are at fault? Do tests accurately reflect what is taught? Are they focused on knowledge, skills, and outcomes relevant to a student's personal and professional life after graduation? The very concept of standardized tests in a world where the half-life of information is less than five years, based on a curriculum that is reaching retirement-age for the world we live in, is absurd. The primary value of "Objective testing" (often called multiple-guess by students) is to provide a set of numbers to categorize the quality of a student or academic institution. Emphasis on this kind of testing has contributed to poor writing skills. If we truly believe in *performance* objectives, *performance* testing, and relevance, it is necessary to re-examine testing and measurement practices and procedures and scrutinize industries that perpetuate the *status quo*.

The classroom model persists, even in distance learning. It is focused on lecture, demonstration, and discussion. Online learning has opened the academic experience to millions of unserved or underserved communities around the world. It is enriched by visualization, interaction, exploration, and peer learning that encompass all learning styles. Modern technologies are ubiquitous, meaning they have interfaces that almost anybody can use. We are in a transition where, for the moment, students are often more technology savvy than their teachers.

As a designer and producer of media, trained in instructional technology and instructional design, I believe it is possible to far exceed the quality of learning that takes place in traditional classrooms. I believe that technology makes customized learning affordable, and through rich learning environments we can stimulate students to explore and learn relevant knowledge and skills and in the process, achieve higher levels of learning and performance. We have the tools, the knowledge and the research to achieve this. And with feedback from each iteration, we can optimize the process for future learners.

The change in emphasis from teaching to learning is a major paradigm shift.

- It makes each student responsible for his or her own goals, learning and performance.
- It challenges "teachers" to become instructional designers, facilitators, counselors, mentors and tutors.
- It encourages collaborative learning where teams of students work with their mentors to achieve their individual and collective goals.

If we are under-funded, there are philanthropic organizations ready to help us. If we are over-regulated, or subject to political interference, we must use the democratic processes at our disposal to affect change.

Editor's Note: This paper is a reminder that the adoption of new technologies requires planning to ensure that the infrastructure will support the technology, and that administrators, faculty, students and support staff are properly trained. Course management systems make learning accessible and efficient for anywhere-anytime learning. With the proper technology and support, online learning and course management systems allow universities to grow when classrooms and faculty office space is impacted.

Evaluating the Impact on Users from Implementing a Course Management System

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Abstract

Nearly all colleges and universities are using some form of e-learning system, usually an expensive course management system (CMS), to create online course offerings or to enhance regular, classroom-oriented courses. Our university has invested a large amount of resources into purchasing and supporting one of the two most popular CMS vendors, and it has become imperative to understand what the effects from using this technology have been, as well as how we can improve the integration of this and other educational technologies into different instructional contexts. This project, through a combination of surveys, call-log analysis, and interviews, was used to investigate the following questions: How has the implementation of a CMS (Blackboard) impacted students and faculty at the university? What are the benefits and challenges from supporting this tool on an institution-wide basis? Our findings conclude that instructors and students are moderately satisfied with the course management tool, but only if it is stable. However, for all of the features available through the CMS, there are only four features regularly used, primarily to increase the efficient transfer of information from teacher to student. We discuss the benefits and challenges reported by students and faculty, along with the acknowledgment that the tool has become critical to many participants' practices.

Keywords: higher education, evaluation, CMS, course management system, e-learning, distance learning, online learning, instructional technology, educational technology, blackboard, blended learning.

Introduction

In the last decade, there has been a rush by higher education institutions to adopt Course Management System (CMS) technologies in an effort to more easily transition courses into a blended, or part online, experience. Now, with over 95% of colleges and universities in the United States using some form of e-learning system (Pollack, 2003), usually an expensive course management system, it is imperative to look closely at the CMS technologies available and evaluate whether these CMS tools are creating effective e-learning environments.

E-learning can take many different forms, and scholars vary in how they define a course management system. For example, one author wrote that a CMS is a "comprehensive software package that supports some or all aspects of course preparation, delivery, communication, participation and interaction and allows these aspects to be accessible via a network" (Collis & de Boer, 2004). For these authors, a CMS is an efficiency tool, designed to help a professor prepare and deliver instruction more efficiently. John Meerts (2003) described a CMS as simply a way to enable teachers who do not have web design skills to be able to easily create a web accompaniment to their courses. Other writers describe CMS tools as having the ability to actually improve the learning of students. For example, Pollack (2003) defined a CMS as "a technology tool that supports and enhances the learning process" (p. 5). Many other instructors,

administrators, and educational researchers define CMS tools as something in between—a tool that can support *some* kinds of learning and provide *some* efficiency benefits.

Recently, two companies have grown to dominate the young CMS market: Blackboard and WebCT, each being used now at over 2,000 different academic institutions (Arnone, 2002; Pollack, 2003). More recently, these two companies have announced their merger, creating one tool that dominates the market. Besides Blackboard and WebCT, there are several other CMS companies with much smaller market shares, including Desire2Learn, eCollege, and Jenzabar. There are also many open-source or freely distributed CMS products, such as the Manhattan Virtual Classroom Project, Sakai, OpenCourseWare, and Moodle. Finally, there are several universities that develop their own CMS systems. Examples are Penn State (Angel). Websites such as Edutools (http://www.edutools.info/course/productinfo/) provide lists of many available CMS products.

When institutions rushed to adopt these, or other, CMS tools, it was not clearly understood how much of a commitment was required. At one time, commercial CMS products were relatively affordable—much more affordable to purchase than it would have been for most institutions to develop their own CMS-type of system. However, in recent years Blackboard and WebCT have both raised their prices dramatically. Colleges and universities are now finding themselves in a difficult situation as the prices of CMS systems are increasing at the same time that instructors are becoming more dependent on these tools for their teaching. Young (2002) commented that this escalating cost structure would have a significant impact on institutions that have already integrated a CMS into their institution. “CMSs have become mission critical systems for many institutions,” Young said, meaning that the need for course management systems has become a critical one for colleges and universities, and going back to instruction without an adequate CMS is no longer seen as acceptable by most students and faculty members.

While the open-source and free alternatives to Blackboard and WebCT might appear to be a much cheaper option for institutions, some, including Meerts, 2003, have predicted that the benefit is small, if there is one at all, because of the cost needed for a university to install, train, and support a free CMS software program, and that home-grown systems often come with their own set of problems (Olsen, 2001). The rising cost of purchasing or supporting a CMS has become a common problem for many institutions. “Course management systems are likely to become as commonplace as email and the web. No institution of higher education will be able to do without either an open source or commercial version of the software,” Meerts said. Similarly, Young (2002) reported that the CMS is now a “fixture” on many campuses. This leaves many institutions scrambling to find the most effective, and affordable, tool for their e-learning support needs.

When considering the cost required to purchase or upkeep a CMS on campus, institutions need to know what the benefit might be to having a CMS, in order to evaluate whether the money spent on such a system is justifiable. Several small studies have found positive impacts from using CMSs in specific types of courses. These studies reported that using a CMS can be helpful for improving communication and collaboration in a course (Hutchins, 2001; Anderson, 2003; Pollack, 2003); increasing student preparation for class and improving the quality of in-class time (Massimo, 2003); enhancing class lectures and feedback to students about grades (Morgan, 2003); giving students greater access to materials (Yip, 2004); and improving learning in other ways (Klecker, 2002). However, other studies have found no significant difference between the grades of students using a CMS and students who did not (Vessell, 2001), and that the benefits of using a CMS can be counter-balanced by many flaws in the software, causing slowness or instability (Dutton, Cheong, & Park, 2004).

Despite these studies, it is surprising how little research and evaluation has been done about the

implications of using these tools. A search of several of the major databases in the fall of 2005 (ERIC, Education Full Text, WebSPIRS, PsychInfo and Ingenta) found 164 published articles that mentioned course management systems, Blackboard, WebCT, Moodle, CMS, or other similar terms in the abstracts. But of these, only 74 appeared to be data-driven articles, and most of these were quick evaluations of how a CMS impacted a particular class or context. Less than 10 studies, that we could find, seemed to attempt a more general evaluation of the impact from using a CMS over multiple contexts, such as multiple university departments. Two of the more extensive evaluations of CMS technologies have been completed by the Educause Center for Applied Research, but not, as far as we know, yet published through peer review (Morgan, 2003; ECAR, 2005). In these reports, the authors have used survey research to conclude there are many positive effects from using course management systems, and that the majority of instructors and students are satisfied with these technologies. More studies of this scope, completed by a variety of researchers and published in accessible sources, would improve our understanding of how the use of these technologies is impacting higher education.

Considering the rapid adoption by almost all institutions of higher education of CMS tools, there needs to be more thought, reflection, and research about what the impact might be. How well do these colleges and universities really understand their implementation of their chosen CMS? After spending the money to purchase and support a CMS, are instructors and students using it? Which features and in what ways? Is it changing how people teach or learn? Are there costs or benefits that we were not prepared for? These are the kinds of questions that need to be asked about a collection of technologies that are becoming as ubiquitous in higher education as the Internet or office software.

Research Questions

Like many others, our university has invested a large amount of resources into purchasing and supporting Blackboard, one of the two most popular CMS vendors. This study was designed to help us better understand the effects on our institution from using this technology, as well as provide ideas for how we can improve the integration of this and other educational technologies into different instructional contexts. Specifically, we investigated the following questions: How has the implementation of a CMS (Blackboard) impacted students and faculty at the university? What are the benefits and challenges from supporting this tool on an institution-wide basis?

Methods

Data Collection

Our methods for collecting data included using open-ended/closed-ended survey questions (n=124 instructors; 163 students) administered to students and instructors over two semesters; an analysis of the calls reported to the Blackboard support center on campus (n=1,341) and semi-structured interviews with instructors (n=48) as well as several brief intercept interviews with students (n=17). We adopted a mixed methods approach to evaluation using both descriptive analysis of survey responses and qualitative analysis of interviews to triangulate our analysis and strengthen our findings (Greene, Benjamin & Goodyear, 2001).

Semester Surveys

We administered the surveys to random samples of instructors and students near the end of the semester in fall, 2004 and winter, 2005. These samples were drawn from the population of Blackboard users on campus (see Figures 1 and 2 for descriptions of the demographics of faculty survey participants).

The selection process included identifying all faculty and students who had at least one Blackboard course and then randomly selecting 200 faculty and 600 students as participants. From this sample, 124 instructors and 163 students responded to surveys in both semesters. The survey questions considered for this article focused on the following categories that were identified as important by institutional stakeholders:

- *Satisfaction*: How students and teachers feel about Blackboard and whether they like and prefer to use it
- *Knowledge*: Whether students and teachers know how to use and operate Blackboard and if they understand its features
- *Usage*: What features in Blackboard students and teachers are using most or least
- *Efficiency*: Whether Blackboard is saving students and teachers time or is increasing their workload
- *Stability*: How well Blackboard is operating and what technical problems students and teachers are experiencing

Survey questions were developed and checked for face and content validity by members of the evaluation team and selected university stakeholders.

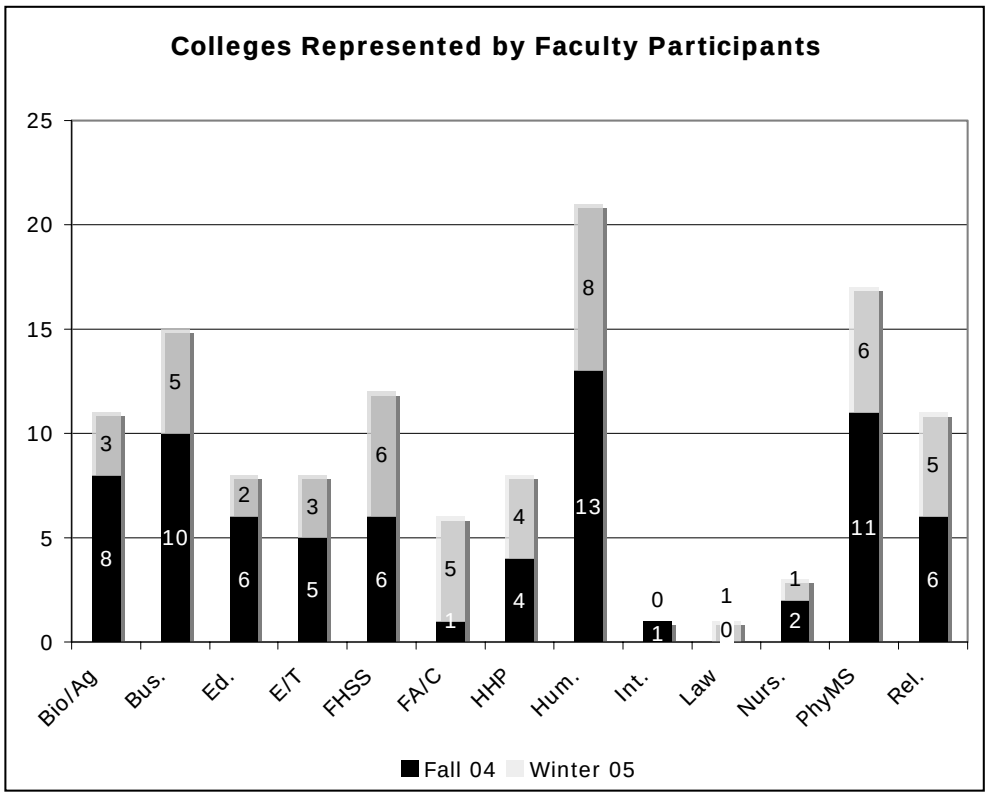

Figure 1. Description of the colleges represented by faculty who participated in the surveys. These are colleges represented by the abbreviations: Biology and Agriculture; Business; Education; Engineering and Technology; Family, Home, and Social Sciences; Fine Arts and Communications, Health and Human Performance, Humanities, International, Law, Nursing, Physical and Mathematical Sciences, and Religious Education.

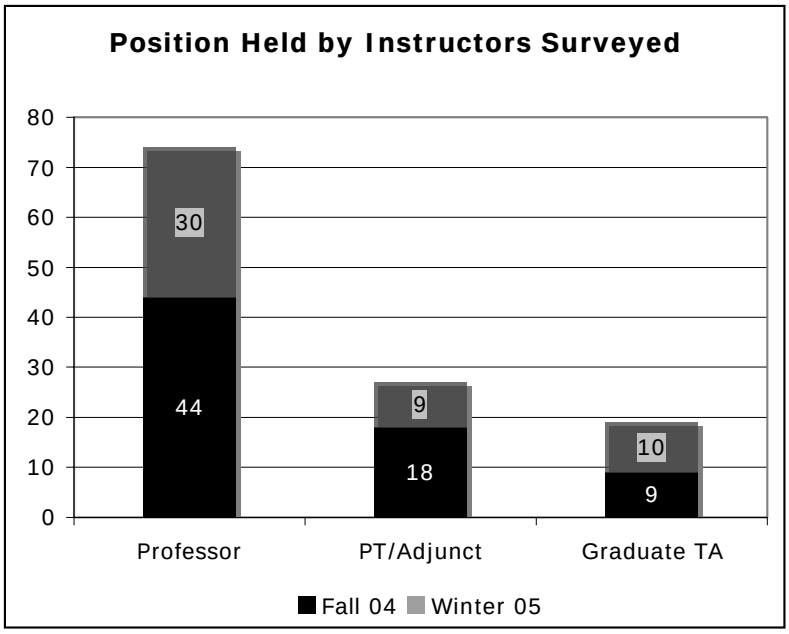

Figure 2. Description of the positions held by the participants in the surveys.

Review of Calls to the Support Center

The Instructional Media Center (IMC) at our university has been responsible for helping instructors and students with Blackboard support issues. The IMC employees note each call that is received, and categorize these calls as belonging to different categories such as course setup, uploading and downloading materials, and use of specific features. We included these calls as data by noting the number of calls received each semester, and the number received for each category. This data provides an easy way to regularly monitor which Blackboard problems are most prevalent on campus.

Faculty and Student Interviews

The interviews with faculty and students were conducted in 28 different departments on campus. Participants were sampled from every college on campus. Initially the sampling was random, but we also used theoretical sampling to find representatives of demographics not represented very well in the random sample and to develop our emerging theories (Glazer & Strauss, 1967). This sampling yielded 36 participants, and our interview protocol is represented in Table 1.

We also utilized some interviews (n=12) from a previous study by two of the authors (see Table 2 for a description of participants' demographics). This previous study investigated patterns of use from instructors who integrated various kinds of technology on campus, and we selected those interviews that focused specifically on the use of a CMS to be included in the data pool of the present study. All of the interviews were semi-structured, one-on-one interviews, and the interviewers used a series of prompts about each category of interest to guide the discussion, while at the same time keeping the interview casual enough for the participants and interviewers to explore the topics. The student interviews (n=17) were shorter, intercept interviews where students were intercepted in popular places on campus and asked two or three questions about their experiences with Blackboard.

Table 1.

Interview protocol used in semi-structured interviews with faculty participants.

Can you tell me about your experience with Blackboard?

Context (5 min)

1. What is your course about?
2. About how many students do you have in each section?
3. Where is the course situated in their programs? (required, optional, mostly freshman, mostly seniors, etc?)
4. How long have you been teaching this course?

Usage (10 min)

1. Do you use Bb? Why do you use Bb (or why do you not?)
2. What persuaded you to use Bb (what would persuade you?)
3. What Bb features do you use? How often? Why do you choose to use them?
4. Can you show me your Bb site? Ask them for a tour.
5. If they do not mention a feature, prompt and ask them if they knew about it and had ever thought about using it and why they do not.

Satisfaction (10 min)

1. What do you think about Blackboard? Has it worked well? Why or why not?
2. What are the benefits from using Bb?
3. What have been the challenges from using Bb?
4. What do you NEED a CMS to be able to do?
5. What would you LIKE it to be able to do if it could be possible?

Efficiency (10 min)

1. Does Bb help you be more efficient? How?
2. Which features save you the most time?

Learning (20 min)

1. Do you feel that using Bb helps you teach more effectively? In what ways? How do you use it?
2. Do you feel that using Bb helps students learn more effectively? In what ways?
3. How do you think a tool like Bb could be used to improve learning in your subject area?
4. If you use the discussion/chat tools, how do you use them? What has worked well? What hasn't worked well?

Table 2

Description of the demographics of faculty interview participants by college and gender.

College	Gender		
	Male	Female	Total
Biology/Agriculture	6	0	6
Business	3	0	3
Education	2	4	6
Engineering/Technology	3	0	3
Fine Arts and Communications	7	2	9
Family, Home and Social Sciences	2	0	2
Health and Human Performance	2	1	3
Humanities	5	0	5
Nursing	0	3	3
Physical and Mathematical Sciences	2	0	2
Religion	3	0	3
Total	35	45	10

Together the student and faculty surveys, support center call record, and faculty interviews provide a rich set of data to understand the implementation of Blackboard at our institution.

Data Analysis

Quantitative Data Analysis

Quantitative data from the surveys and from the calls to the campus Blackboard support center were analyzed using descriptive data analysis techniques, an important method often used in educational research (Knupfer & McLellan, 1996). In this project, we reported the quantitative data from students and faculty as means and percentages, and then compared the data to identify patterns.

Qualitative Data Analysis

After transcribing the interviews, we began coding the data using a constant-comparison approach (Glaser & Strauss, 1967) to determine the sub-categories, properties, and relationships existing in the main categories, which had been determined by our research questions. Once all of the transcripts were coded, each domain or main category was re-analyzed to synthesize and determine the relationships between the codes and to identify the key findings relevant to each particular domain.

Establishing Trustworthiness of Qualitative Data

For the qualitative data in this project, we used methods suggested by Lincoln and Guba (1985) for establishing the trustworthiness of the research. These authors propose four standards for establishing trustworthiness: credibility, transferability, dependability, and confirmability. To meet these standards, we have emphasized using triangulation, member checking, and thick description. We triangulated the findings by using multiple sources of qualitative and quantitative data (interviews and open-ended survey questions) from multiple sites and contexts (28 university departments). To validate the main case studies, we checked the final descriptions of the cases with the participants to ensure they were accurate portrayals of their experiences. Finally, we have attempted to provide as much thick description as we could while still addressing all of the diverse aspects of our findings by utilizing quotes from the interviews and case studies. A research journal was also kept to describe the steps we took to complete this project.

Findings and Discussion

Our research purpose was to investigate the impacts from implementing a course management system on an institution-wide level. It might first be helpful, however, to review the context of our university's association with Blackboard. In general, the use of Blackboard is fairly ubiquitous on campus. Our university has an average enrollment each semester of 30,000 students, who participated in just over 8,000 academic courses for both fall and winter semesters in 2004. There were also slightly more than 4,000 Blackboard courses created during each semester, meaning about half of the courses on campus were using the tool. Through the 2004-2005 school year, over 300,000 students and faculty are estimated to have used Blackboard at least once. In surveys given during fall and winter semester of the 2004-05 school year to faculty and student Blackboard users, instructors reported averaging nearly two Blackboard courses each while students reported being enrolled in an average of five courses each.

To foster more effective uses of Blackboard at our institution, we provided a wide range of Blackboard training opportunities for faculty. These training offerings included training for new users to familiarize them with how to set up a course and how to use the functionality within the Blackboard system. Additionally, there were training for more advanced users of the system that focused on using communication, and assessment tools as well as posting pedagogical content. Training and consultation was also offered that focused on technology integration and instructional design-related issues to help faculty better utilize the course management system.

Instructor and student usage of the CMS

We have learned that the truth about "whether Blackboard is used by instructors" depends on how usage is defined. For example, most instructors at our university only used four features: email, announcements, posting of course documents, and the online gradebook (see Figure 3), but, according to our interviews, they often only used the gradebook for communicating scores to students and not for actually calculating grades.

Another tricky aspect of understanding how much instructors actually used Blackboard was the impact of the teaching assistants (TAs). It is difficult to completely define how many instructors "used" Blackboard, because while they may have had Blackboard courses listed under their names, some did not actually create or maintain the courses. Rather, they let their TAs run the online portion of class. We believe this was fairly common because instructors were more likely to use Blackboard in large courses, large courses often have TAs, and TAs usually are involved in grading, distributing documents, and other tasks that instructors usually associate with Blackboard. Because we found TAs to sometimes be the person coordinating instruction through the CMS, we feel that future training and CMS support will be more effective if an emphasis is also made to train the teaching assistants on campus, who could then help train the professors.

Satisfaction with the Tool

To answer our question about what the impact has been from using a CMS, we first will consider the satisfaction of the faculty and students. When Blackboard worked without technical difficulties—and this is an important "when" clause that we discuss later in this paper—most students and instructors at our university reported being satisfied with the tool because it was convenient for them to use, easy to learn, and helpful in their studies. Sixty-six percent of student survey respondents in the winter semester (67% in fall semester) preferred that their instructors use the tool (see Table 3), and 73% (winter) and 75% (fall) of students said it was easy to use Blackboard. Most instructors also indicated that they were comfortable and confident using Blackboard in their teaching, and that it was not difficult for them to use the CMS (see Table 4).

Table 3.

How satisfied students are with Blackboard and how comfortable they feel using the tool.

Survey Question	Population	SD	D	N	A	SA
Blackboard is easy to learn/use.	Fall 04 Students	4.2%	6.3%	14.6%	68.8%	6.3%
	Winter 05 Students	6.2%	6.2%	14.2%	55.8%	17.7%
I prefer that instructors use Blackboard in their courses	Fall 04 Students	10.2%	4.1%	18.4%	36.7%	30.6%
	Winter 05 Students	6.3%	7.1%	20.5%	42.9%	23.2%

Note. SD=Strongly Disagree, D=Disagree, N=Neither, A=Agree, SA=Strongly Agree.

Table 4.

How satisfied faculty are with Blackboard and how comfortable they feel using the tool.

Survey Question	Population	SD	D	N	A	SA
I am not comfortable using Blackboard in my teaching	Fall 04 Faculty	33%	45%	10%	12%	0%
	Winter 05 Faculty	15%	52%	17%	13%	4%
I feel confident using Blackboard to help me teach.	Fall 04 Faculty	0%	8%	24%	50%	18%
	Winter 05 Faculty	0%	17%	24%	54%	4%
I have an easy time using Blackboard.	Fall 04 Faculty	6%	16%	16%	51%	12%
	Winter 05 Faculty	7%	16%	18%	56%	4%

Note. SD=Strongly Disagree, D=Disagree, N=Neither, A=Agree, SA=Strongly Agree.

The features of Blackboard with which instructors and students were most satisfied were the announcements, course documents, gradebook, and sometimes email features (see Figure 3). The features with which they were most dissatisfied were the ones commonly referred to on campus as the pedagogical features: synchronous chatting tools, discussion boards, assessments, and the digital dropbox (see Figure 4).

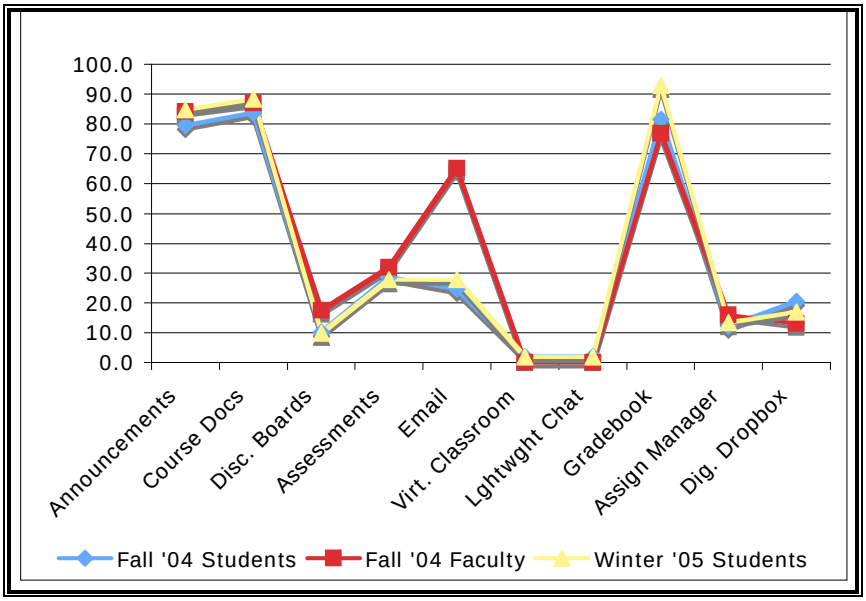

Figure 3. Instructors and students most favor using the announcements, course documents, gradebook, and email features of Blackboard.

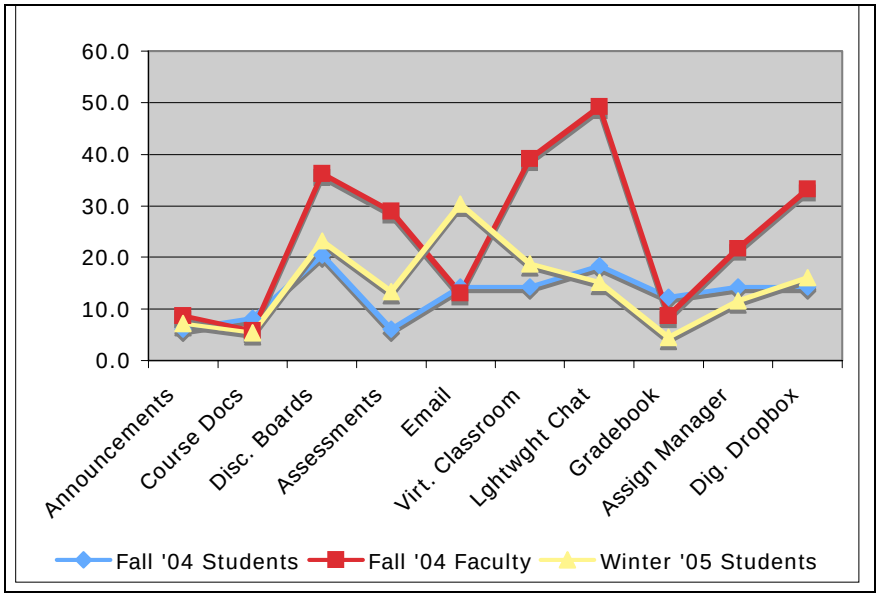

Figure 4. The features of Blackboard with which instructors and students are most dissatisfied.

Stability of the Tool

Closely aligned with faculty and student satisfaction of the CMS was its stability. At our university, the implementation of a CMS has been a very large project. Many other services on campus, such as the library, registration, etc., have been integrated into this CMS. With a system this large, there are bound to be some stability problems. However, it seems that the stability problems with Blackboard were excessive. In Fall 2005, 76% of instructors said they had experienced technical problems with Blackboard, but this jumped to a full 100% of winter respondents (see Figures 5 and 6). In the winter semester, over half of the instructors indicated they had encountered technical problems in just the previous week (see Figure 6). Students seemed slightly less likely to have difficulties with Blackboard, but this number also jumped in winter semester to 90% of students having encountered problems (see Figures 5 and 6).

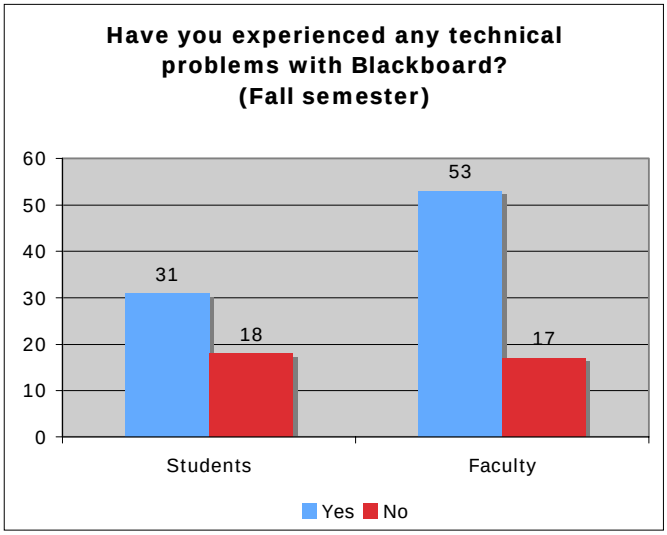

Figure 5. Percentage of students and faculty who experienced technical problems with Blackboard through Fall 2004.

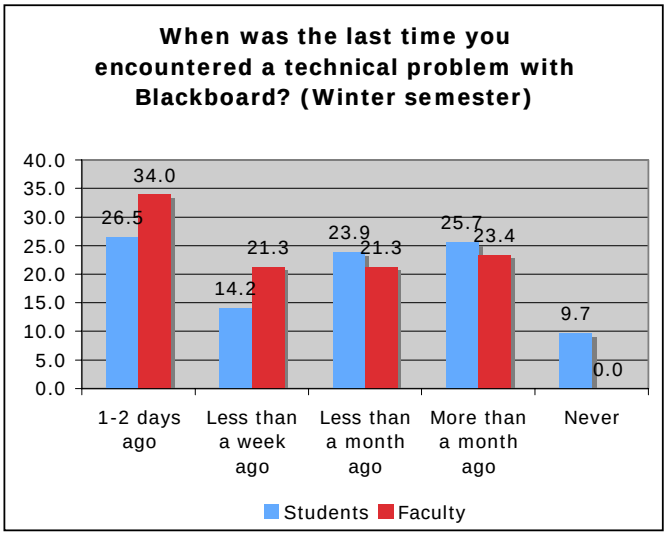

Figure 6. Frequency of technical problems experienced by survey respondents from the Winter 2005 semester.

One of the biggest frustrations during this school year was that Blackboard was unstable in some of its most critical areas, and there were many sad cases of students' test scores being lost after a long exam, of critical emails with important information being lost without any warning given to the instructor, and of students being locked out of courses or exams (see Figures 7 and 8 for data on the most problem-plagued features). These stability problems negated, for many, the benefits derived from using a CMS, and most students and instructors, when asked if they like the tool, respond, "When it's stable."

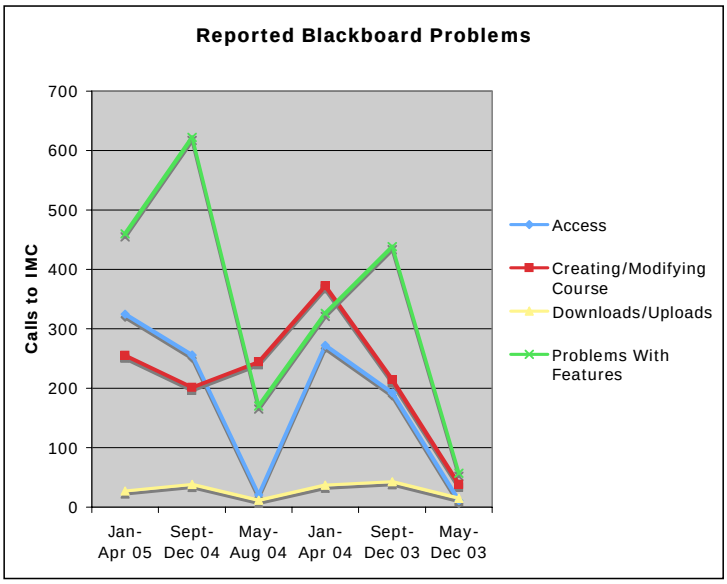

Figure 7. Number of problems reported, according to category, to the university's support center for Blackboard on campus from 2003 to 2005.

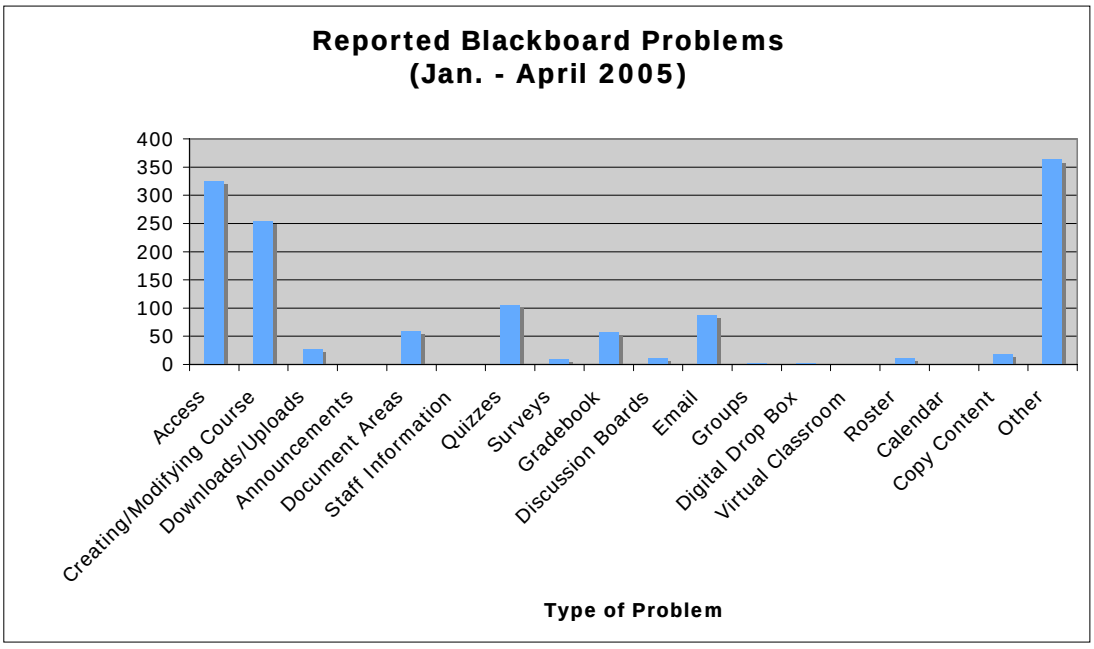

Figure 8. Types of technical problems reported to the Blackboard support center on campus in the winter of 2005.

We have learned that stability has much more at stake than simple convenience. One instructor shared his story of how when Blackboard lost 25% of his students' test scores, and several critical emails were not delivered, his relationship with his students was permanently damaged. "Whatever teacher ratings I would get this semester, Blackboard will take 1/2 a point off. It looks like it works great, but there are glitches," he said. Consequently, he was much less motivated to use Blackboard, or any computer-based educational technology in the future. "It's made me think I need to go back to the Stone Age and use hard copies. Then if I lose something, I'VE lost it," he said.

Blackboard can be Used to Improve Efficiency

While stability was a challenge, there were still many overall benefits to purchasing and supporting Blackboard at our university. The biggest benefits we found were gains in efficiency, convenience, and class organization and management. Many instructors felt that Blackboard was a tool that saved them in-class and out-of-class time and made teaching more convenient. Exactly half of the instructors responding to the fall survey and 41% of the winter respondents felt this way, compared with about 26% of instructors who felt Blackboard cost them time overall (see Figure 9). The majority of students also felt that using Blackboard helped them be more efficient (65% fall semester and 57% winter semester). However, for both instructors and students, this was not as strong of a majority as might be expected, probably because of stability issues, which increased in winter semester.

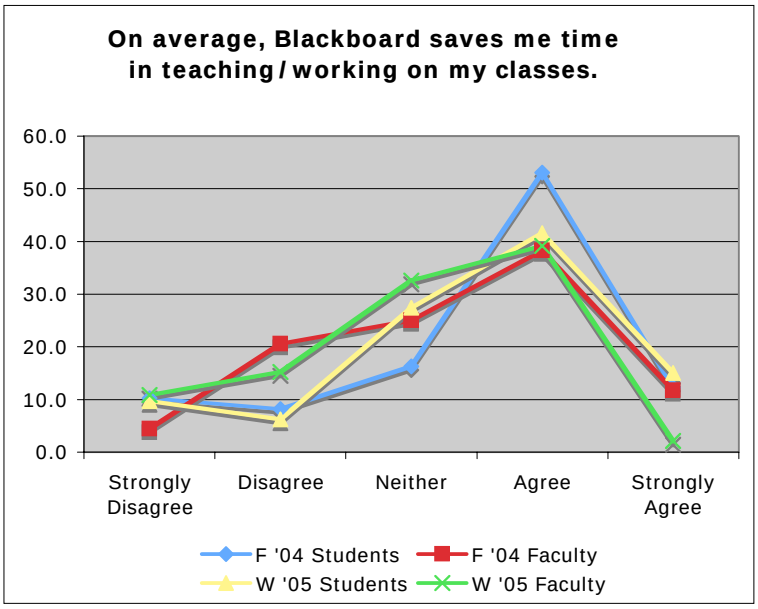

Figure 9. Most students and instructors feel Blackboard helps them be more efficient.

There were several methods for using Blackboard that seemed to increase efficiency benefits, and here we will explain four that seemed to be most prevalent. First, it was very common for instructors and students to feel that Blackboard saved time in the distribution of class materials. As one instructor said, "I don't have to worry about creating a packet or publishing a textbook or creating a lengthy syllabus and pass[ing] out paperwork all during the semester. It's a major convenience for me." A second benefit was that course materials could be updated electronically, and then students could be directed to the newest versions without the instructor needing to print copies of every document every time there is an update. Third, using Blackboard was helpful in pacing the instructor and the students and in keeping the course organized.

For example, in courses that had multiple labs connected to a single course, Blackboard was a useful tool for organizing the different lab sections, as well as for monitoring the TA activity in the different sections. However, even in one-section courses, using Blackboard helped the instructor pace the teaching because everybody was aware of the schedule for the class. One student commented that “It allows (and makes) professors be more organized. For the class that doesn't use Blackboard, I am often confused at what material I should know, assignments, etc.”

Finally, Chickering and Gamson (1987) wrote that feedback was a critical element to effective undergraduate instruction. Many instructors and students felt that Blackboard made the giving of feedback more efficient, thus allowing instructors to give feedback more quickly and more often. Instructors found that when they used Blackboard to communicate scores to students, there were less disagreements about mistakes, because the students were more aware of their standing in the course at all times. One instructor said, “It's a good way to keep track of grades, and make the students responsible for their own grades so that they can look, and if I haven't recorded something, it's their job to call me. . . . It saves time at the end of the semester so you don't get a whole bunch of students saying, ‘C+, I thought I had a B.’” Also the email feature and discussion board features allowed instructors and students to more easily communicate outside of class time, increasing the interaction and opportunity for feedback on performance.

Conclusions

In this study we investigated the ways that a CMS has been used on campus and their knowledge of how to use the tool. We also studied the impacts from using a CMS on faculty and student efficiency and satisfaction. Faculty and students overall were moderately satisfied with Blackboard as a course management tool, but only if it is stable. We learned that stability was a very major concern for instructors and students, and must be more adequately addressed. At our university, instructors and students were using the tool in many classes, but usually only for the posting of course documents, communicating of student grades, announcements and email. These features were primarily used to increase the efficient transfer of information from teacher to student.

Even though many instructors responded that they liked Blackboard overall when it was stable, most found some aspects of the tool that they did not like. For example, one instructor said, “I've used Blackboard for three years now. Some aspects I really appreciate, and other aspects I have grown to dislike intensely." However, even though Blackboard was not a perfect tool for most people, many instructors in interviews expressed concerns about the possibility that our university might leave Blackboard for another CMS option after they have spent a lot of time learning the tool, preparing materials for online distribution, and uploading many years’ worth of these materials onto their Blackboard courses. For example, one instructor said, “If we get rid of Blackboard, it would be discouraging. . . . You don't want to do this but once in a lifetime. I've put hours and hours of busy work into it. I'd like to be able to use it next year." Another instructor remarked, “It dramatically reduces the effectiveness of the tool [to change to a new tool]. The purpose of the tool, as I understand it, is to save time and effort; but every time you update it, you redo everybody's effort. Please don't do that.”

In this way, because of the large-scale adoption of a single CMS at our university, the tool became somewhat “mission critical,” and many instructors were dependant upon the tool. In fact, it was because so many felt that their instruction was now tied to the tool that stability was such a major issue, for losing Blackboard at critical moments for many instructors was like having the lights turned off in the classroom or the textbook not available in the bookstore. To some degree, these instructors felt married to Blackboard, for better and for worse.

A main motivation for this research study was to provide data for university stakeholders to decide whether or not they should continue paying the price tag every year for a large, commercial CMS, and whether the costs for purchasing and supporting a CMS are outweighed by the benefits. These are difficult questions to answer. If the goal of university administrators and teacher development services is to improve the efficient transfer of documents, grades, and communication between students and instructors, then using a CMS was an improvement and enhanced these types of educational activities. However, if the goal is to help educators to move towards more student-centered, constructivist, or exploratory instruction, then using a CMS did not appear to be as helpful, at least not the way it was implemented by most instructors in this study.

An alternative possible lens for interpreting these results may be provided by the Concerns-based Adoption Model (CBAM). In this model, Gene Hall and Shirley Hord (1987) describe a series of concerns that instructors have as they adopt an innovation. In order, these concerns are awareness, informational, personal, management, consequences, collaboration, and refocusing. The earlier concerns focus mostly on becoming aware of an innovation, and simply learning to survive successfully with that innovation. Later, instructors acquire concerns about consequences, leading them to eventually refocus their use of the innovation to improve consequences, such as learning outcomes. It could be that because the adoption of CMS technologies was still a relatively new occurrence for many instructors on our campus, instructors and students still had basic concerns of simply managing the technology, and were consequentially using the tool for those tasks that were easiest, such as to communicate with students about grades or announcements or to "hand-out" articles to read. This could explain why the tool was mostly used for teacher-centered instructional activities. This hypothesis leads us to hope that more creative exploration of the technologies may still be in the future as instructors' concerns shift towards refocusing their practice so that other, more student-centered, learning outcomes can be accomplished by using the tool.

No matter which hypothesis is accepted, it is crucial for universities that purchase and support CMS technologies to continue conducting studies to assess the costs and benefits of these administrative decisions. We believe that the dimensions outlined in this paper including student and faculty satisfaction, knowledge, usage, efficiency, and stability are important vital signs of CMS implementation that could guide similar large-scale evaluations. Like medical vital signs, these are attributes indicating a healthy implementation of an educational technology. Continual assessment in each of these vital areas can allow an institution to quickly notice problems and spend its efforts on collecting additional data about the areas of greatest concern so that prescriptive strategies can be created. These evaluation methods are scalable and could facilitate decisions, made by administrators, that will have significant impacts on improving how we integrate CMS tools on campuses.

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Editor's Note: Researchers are not content to know what works, they explore the mechanisms to determine why and how cognition, processing and learning takes place. Higher levels of learning, such as critical thinking, are the source of many studies. The present research relates an experiment using Peter Oriogun's SQUAD method to the Practical Inquiry model used by Garrison and Fahy's Cognitive Presence model.

Assessing Critical Thinking in a New Approach to Computer-Mediated Communication (CMC) Transcripts

Peter K. Oriogun

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Abstract

Critical thinking involves analysis, critique and some evaluation of the information gathered in order to make a reflective and well founded conclusion from the same. It is therefore very important to understand that critical thinking ultimately affects all forms of communication, including speaking, writing, listening and reading. Critical thinking in online communication is particularly challenging as it puts emphasis on students' comprehension and knowledge of elements of an argument, as such, interacting with different ideas and one another. In this article, the author assesses critical thinking in a new semi-structured approach to computer-mediated communication, the SQUAD approach (Oriogun, 2003; Oriogun, Ravenscroft and Cook, 2005) using the *practical inquir*y (PI) model (Garrison, Anderson, & Archer, 2001) as a framework. The phases of the SQUAD approach are mapped directly (Oriogun, Ravenscroft and Cook, 2006) with the *practical inquir*y model's cognitive presence phases. From such mapping, the author then compares Fahy's (2005) latest study of the cognitive presence model with the initial pilot study by Garrison et al. (2001) in the three SQUAD case studies presented. It is argued in this article that the SQUAD approach is superior to using interrater reliability measurement of online transcripts when using the *Practical Inquiry* (PI) model to assess critical thinking or cognitive presence of online groups. It is further argues that there was an insufficient number of posting (24) by the four students over a period of one week, in the initial pilot study by Garrison et al. (2001) to draw any concrete conclusion from the study. The author, however, concurs with Garrison et al's (2001) conclusion 'that the practical inquiry model could serve as a framework for future research in a quest to better understand the cognitive nature of the teaching and learning transaction in an asynchronous text-based conferencing environment'.

Keywords: CMC; community of inquiry; cognitive presence; critical thinking; practical inquiry model; Transcript Analysis Tool (TAT); SQUAD Approach; content analysis

Introduction

The challenge in online learning and distance education is for educators to develop educational strategies to meet a diversity of students needs in this modern world. New technologies afford students an opportunity to experience a number of new learning environments where they are able to communicate irrespective of time or geographical location. Some critics argue that the type of learning that occurs in distance education is insufficient to develop critical thinking, and furthermore, that learners should be empowered to critically examine and construct meaning through their own prior experiences (Garrison, 1993; Lauzon, 1992). Consequently, Lauzon (1992) suggests that distance educators should positively promote dialogue in order for learners to take ownership of the knowledge gained in such learning environment. A common learning style adopted by a number of higher education institutions offering online learning and/or distance education is the use of discussion forums to foster critical thinking skills. Unfortunately, research has shown that not all students involved in online discussion forums have the necessary

latent projective skills to fully participate and interact within such teaching and learning environment.

Critical Thinking Skills Online

Critical thinking involves analysis; critique and some evaluation of the information gathered in order to make a reflective and well founded conclusion. It is important to understand that critical thinking ultimately affects all forms of communication, including speaking, writing, listening and reading. According to Bullen (1998), critical thinking skills during online discussion involve four components; namely, cognitive maturity, teaching style of the lecturer/instructor, the students prior experiences and the degree of understanding of the critical thinking process. Jones (1996) summarised Meyers (1986) suggestion that critical thinking across the disciplines have features in common, namely:

1. Critical thinking is a learnable skill with teachers and peers serving as resources.
2. Problems, questions, and issues serve as source of motivation for the learner.
3. Courses are assignment-centred rather than text or lecture oriented.
4. Goals, methods, and evaluation emphasize *using* content rather than simply *acquiring* it.
5. Students collaborate to learn and enhance their thinking

Oriogun (2003) adapted Henri's (1992) classification of critical thinking in what he called cognitive indicators, when he developed his semi-structured approach to online discourse called SQUAD. These cognitive indicators are categorized as Elementary, In-depth, Inferencing, Judgement and Application of Strategies (see Table 1)

Table 1

Cognitive Indicators of the SQUAD Approach (Oriogun, 2003)

Reasoning skills	Definitions
Elementary clarification	Observing or studying a problem, identifying its elements, and observing their linkages in order to come to a basic understanding.
In depth clarification	Analysing and understanding a problem to come to an understanding which sheds light on the values, beliefs, and assumptions which underlie the statement of the problem.
Inferencing	Induction and deduction, admitting or proposing an idea on the basis of its link with propositions already admitted as true.
Judgement	Making decisions, statements, appreciations, evaluations and criticisms. Sizing up.
Application of strategies	Proposing coordinated actions for the application of a solution, or following through on a choice or a decision.

In a more recent article, Oriogun, Ravenscroft and Cook (2006) mapped the cognitive indicators of the SQUAD approach with the method proposed by Garrison et al. (2001) for detecting *triggering events, exploration, integration* and *resolution* called *Cognitive Presence*. *Cognitive*

Presence can be summarised as having four phases of critical thinking, namely, a *Triggered Event* deals with starting, inviting or soliciting a particular discussion; the *Exploration* phase is when information is exchanged between the learning participants; the *Integration* phase is when participant learners construct meaning and propose possible solutions; and finally, the *Resolution* phase is when proposed solution(s) is/are tested out (Garrison et al., 2001:11).

Recent Tools Developed at London Metropolitan University for Measuring Students Critical Thinking within a CMC Environment

In this modern technology driven society, online communication is exceptionally challenging for students and educators. In recent years, we have seen the widespread adoption of computer mediated communication (CMC) in education, including extensive interest in using online communications to facilitate asynchronous dialogues, e.g. online teamwork. Consequently, recent research, for example on dialogue analysis, has attempted to explore the relationship between online dialogue features (e.g. roles, strategies, form and content) and learning (Pilkington, 2001). Such an analysis can provide useful insights into the nature of the learning processes from the perspective of, for example, a speaker's intention in a transmitted message and what the receiver perceives has been communicated by the message. However, a problem arises if we wish to investigate specific categories or variables of the learning process, e.g. participation, interaction, social, cognitive and metacognitive (Henri, 1992). It is hoped that recent tools developed at London Metropolitan University will assist educators in engaging their students online as well as aid in measurement of students critical thinking skills or what Oriogun, Ravenscroft and Cook (2005) have termed as *cognitive engagement*.

The Learning Technology Research Institute at London Metropolitan University recently developed a tool called 'InterLoc' (http://www.interloc.org/). This tool supports digital dialogue games for learning. Its structure, scaffold and support multimedia dialogues are highly engaging and foster 'reasoned' discourse and critical thinking through 'live' peer interaction. It incorporates an environment that supports a multi-phased activity (e.g. preparation, interaction and summary) and the use of particular dialogue games (e.g. critical discussion and reasoning, exploratory dialogue and creative thinking) that foster 'academic' discourse and thinking. The approach is particularly suited to groups of 4-8 students. The activities and dialogue games can be reused or adapted to address particular educational problems and contexts. The tool is highly flexible, and can support a range of pedagogical approaches, from informal student-centred learning activities to more formal course-related exercises. The key features of the tool are (http://www.interloc.org/):

- A game design that promotes motivation, confidence and engagement
- Integration of multimedia artefacts
- Structured interaction through coordinating activities, dialogues, conversations and replies
- Message openers (e.g. 'I think...', 'I disagree because...', 'Is there any evidence?...') that promote coherent dialogue, thinking and deep learning
- Reusable and adaptable learning activity and dialogue game templates

Recently, Oriogun (2006) used content analysis of online transcripts to study quality of interaction, participation, and cognitive engagement. New tools developed by the London Metropolitan University were used to improve inter-rater reliability. One of the tools is a software prototype supporting the SQUAD approach. The SQUAD approach to CMC discourse invites students to post messages based on five given categories, namely, ***S**uggestion, **Q**uestion, **U**nclassified, **A**nswer and **D**elivery.* The approach to online discourse adopts problem-based

learning (Barrows, 1996; Bridges, 1992; Oriogun et al, 2002) as an instructional method with the goal of solving real problems by (Oriogun, 2003):

- Create an atmosphere that will motivate students to learn in a group setting online;
- Promote group interactions and participation over the problem to be solved by the group online;
- Help learners to build a knowledge base of relevant facts about the problem to be solved online;
- Share newly acquired knowledge with a group online with the aim of solving the given problem collaboratively and collectively;
- Deliver various artifacts' leading to a solution or a number of solutions to the problem to be solved online.

Related Work

In order to enhance students participation, interaction and cognitive engagement online, Oriogun, Ravenscroft and Cook (2005), suggested, that "one way of engaging learners in online collaborative learning is to create an environment in which knowledge emerges and is shared. The onus is therefore on the tutor/instructor to (1) create an environment in which knowledge emerges and is shared through the collaborative work within a group of students, and (2) facilitate sharing of information and knowledge among members of a learning team instead of controlling the delivery and pace of course content". A methodological framework, developed by Oriogun (2003), called the SQUAD approach was used to develop their argument in the article (Oriogun, Ravenscroft and Cook, 2005) when they validated the cognitive engagement of postgraduate software engineering students at the London Metropolitan University during the two academic semesters of 2004-2005.

Existing literature at the time of the study (Oriogun, Ravenscroft and Cook, 2005) revealed that there are no tools for measuring the cognitive engagement of groups of people working on a particular task/problem online, such as a group's course work for a module or course. There are tools available for investigating cognitive elements of individuals working online (Henri 1992; Hara, Bonk, and Angeli 2000; Fahy 2002; Garrison et al. 2001; Oriogun 2003; Oriogun and Cook 2003). In the article (Oriogun, Ravenscroft and Cook, 2005) we adopted the theoretical framework of two recently developed tools, commonly used for analyzing students' cognitive elements online (Fahy 2002; Garrison, Anderson, and Archer 2000, 2001) at an individual level in order to validate at group level the cognitive engagement of groups of students working within the SQUAD approach.

The Study

In this article, the author will use the SQUAD statistics gather from two groups of Masters Software Engineering students and one group of Masters Computing students from 20th June 2006 until 31st August 2006, a total of 73 days, to measure the cognitive engagement of the students according to the mapping of the SQUAD approach to the Cognitive Presence model (Oriogun, Ravenscroft and Cook, 2006). The first group of Masters Software Engineering students was composed of 4 students. They posted a total of 23 messages over the 73 days of the study. The second group, also of Master Software Engineering student had 5 members. They posted a total of 80 messages over the 73 days of this study. The third and final group, the Masters Computing students had 5 members. Table 2 shows the SQUAD statistics for Master Software engineering Students (Group1).

Table 2

Case Study 1 -Masters Software Engineering Students (Group 1)

Student	S	Q	U	A	D	Total
S1	1	1	3	1	0	6
S2	6	0	0	4	0	10
S3	2	0	0	0	0	2
S4	3	2	0	0	0	5
TOTAL	12	3	3	5	0	**23**

These students were completing a group assignment in a module called Software Project Management, a designated or optional module on both Masters courses. This component of the module is very practical, and students were given a practical Project Management problem to solve using PRINCE 2 as a methodology, template or vehicle by which to solve the problem. If they pass the module, it will count towards the total of 6 taught modules and a dissertation, which is also worth an equivalent of 3 core or compulsory modules. Out of the 6 taught modules, 4 are core. The group assignment is 50% of the Software Project Management module; the other 50% is an open-book test, which is more theoretical in nature. These students were, at the time of the study, working from England, India, Nigeria and Pakistan. These were all full-time mature students. Table 3 shows the SQUAD statistics for Master Software engineering Students (Group2).

Table 3

Case Study 2 -Masters Software Engineering Students (Group 2)

Student	S	Q	U	A	D	Total
S5	1	0	1	0	1	3
S6	7	2	0	7	7	23
S7	4	2	1	6	0	13
S8	5	2	1	10	21	39
S9	1	1	0	0	0	2
TOTAL	18	7	3	23	29	**80**

The purpose of using the SQUAD environment to facilitate these students group coursework online was because all of the students were full-time students, sharing the same designated or optional module on their Masters programmes. Another reason for getting the students to use the tool was that they have already used the SQUAD environment from September 2005 until January 2006 when they first enrolled on the module, as such they should know the way around the software tool. The final rationale for using getting the students to use the tool was to actually evaluate their collaborative group effort spent on the assignment, as well as obtaining some

qualitative measure of each student's cognitive engagement when mapped to Garrison et al's Cognitive Presence categories. Table 4 shows the SQUAD statistics for Master Computing Students (Group3).

Table 4

Case Study 3 -Masters Computing Students (Group 3)

Student	S	Q	U	A	D	Total
S10	24	0	8	4	7	43
S11	5	0	1	0	0	6
S12	5	0	19	6	7	37
S13	32	0	0	0	0	32
S14	7	1	66	13	1	88
TOTAL	73	1	94	23	15	**206**

Mapping Phases of the *Practical Inquiry* Model's Cognitive Presence directly onto the Phases of the SQUAD Approach

The SQUAD approach (Oriogun, 2003) to CMC discourse provides a means through which statistics compiled from students' online discourse can be used to generate objective estimations of their degree of learning engagement. The cognitive indicators of the SQUAD approach are based on Henri's (1992) cognitive indicators. The following section explains how we have mapped the SQUAD approach with Garrison et al's (2001) framework. Our use of mapping in this article refers to the tools being equivalent for measurement purposes.

The SQUAD category S described above is focused on what the group has to deliver for their group coursework, and does not necessarily deal with significant personal revelation. It also encourages students to initiate, continue or acknowledge interpersonal interaction, and or "warm" and personalize the discussion by scaffolding/engaging comments connects or agree with, thank or otherwise recognize someone else, and encourage or recognize the helpfulness, ideas and comments, capabilities and experience of others. The phases of the *Practical Inquiry* model capable of being mapped to SQUAD category S are *Triggers* and *Exploration* (see Table 5).

The SQUAD category Q is a form of words addressed to a person in order to elicit information or evoke a response. An example of a *question* within the SQUAD framework is when students seeks clarification from the tutor or other students in order to make appropriate decisions relating to the group coursework (Oriogun, 2003). The phases of the *Practical Inquiry* model capable of being mapped to SQUAD category Q are *Triggers* and *Exploration* (see Table 5).

The SQUAD category U is normally not in the list of categories of messages stipulated by the instigator of the task at hand. This tends to happen at the start of the online postings. Students may be unsure of what the message is supposed to convey. In most cases, it falls within one of the four classified categories (Oriogun, 2003). The phase of the *Practical Inquiry* model capable of being mapped to SQUAD category U is *other*. Results of analysis of 24 message transcripts by Garrison et al's (2001) showed that one-third (8) of the postings did not relate to any of the four phases of the critical thinking model (p.19), as such, they categorised this phase as *Other* (see Table 5).

Table 5

Matrix for mapping 5 Phases of the Practical Inquiry Model's Cognitive Presence to Phases of the SQUAD Approach (Oriogun, Ravenscroft and Cook, 2006)

Phases of the Practical Inquiry Model	Phases of the SQUAD Approach to CMC Discourse				
	S - Suggestion	Q - Question	U - Unclassified	A - Answer	D - Delivery
Triggers	x	x		x	
Exploration	x	x			
Integration					x
Resolution				x	x
Other			x		

The SQUAD category A is a reply, either spoken or written, to a question, request, letter or article. Students are expected to respond to this type of message with a range of possible solutions / alternatives. Also, the SQUAD category S is the process whereby the mere presentation of an idea to a receptive individual leads to the acceptance of the idea, and, students engage with other students within their coursework groups by offering advice, a viewpoint, or an alternative viewpoint to a current one (Oriogun, 2003). The phases of the *Practical Inquiry* model capable of being mapped to SQUAD category A are *Triggers* and *Resolution* (see Table 5).

The SQUAD category D is the act of distribution of goods, mail etc. This is where students are expected to produce a piece of software at the end of the semester. Al the students have to participate in delivering aspects of the artefacts making up the software (Oriogun, 2003). At this point students may show their appreciations to part of the group coursework deliverable by responding with comments with real substantive meaning. The phases of the *Practical Inquiry* model capable of being mapped to SQUAD category S are *Integration* and *Resolution* (Table 5). Table 6 shows Oriogun's consolidation of the cognitive elements of the SQUAD approach using the *Practical Inquiry* model as a framework.

Table 6

Consolidation of Cognitive Elements of the SQUAD using the *Practical Inquiry* Model's Cognitive Presence as a Framework (Oriogun, Ravenscroft and Cook, 2006)

Phases of the Practical Inquiry Model	Oriogun's SQUAD Mapping
Trigger	(S+Q+A)/2
Exploration	(S+Q)/2
Integration	D/2
Resolution	(A+D)/2
Other	U

The author will also compare the result of an established researcher on CMC transcripts also using the PI model as a framework at message level (Fahy, 2005), using the three case studies from master's computing students at London Metropolitan University as described above. The study corpus used in Fahy's (2005) most recent study was a transcript of 462 message postings, generated by thirteen students and an instructor/moderator, engaged in a 13-week distance education graduate credit course delivered totally at a distance. All of the students were experienced online users, and the instructor was an experienced distance educator who had used online to instruct graduate courses at a distance over five years. In Fahy's present study the whole posting was coded into one of the *Practical Inquiry* (PI) model's five phases. It was reported Fahy (2005) that an overall code-recode reliability of 86% was achieved with the PI model.

Table 7

Total Number of SQUAD Posting by Master's Software Engineering and Computing Students (20th June 2006 – 31st August 2006)

Case Study	S	Q	U	A	D	Total
1	12	3	3	5	0	**23**
2	18	7	3	23	29	**80**
3	73	1	94	23	15	**206**

Findings

Tables 8 & 9 shows the comparison of the initial pilot study Garrison et al. (2001) with Oriogun's SQUAD current study and Fahy's (2005) present study using the *Practical Inquiry* model as a framework for three case studies referred to in Table 5 above.

It is worth noting at this point that the Initial Pilot Study by Garrison et al. (2001) and Practical Inquiry Results, Oriogun's SQUAD Current Study –Case Study 2 are both at message-level, whilst Practical Inquiry Results, Fahy (2005) Latest Study operates at sentence-level. Fahy's latest study of 462 message postings has 3126 sentences and 54000words. Both the Initial Pilot Study by Garrison et al. (2001) and Fahy's latest study required interrater reliability measure. In the case of Garrison et al's (2001), coefficient of reliability of 83.33 with a Cohen (1969) Kappa (k) value of 0.74 was achieved in their third transcript analysis after learning from the possible errors that could have been generated with the first two separate transcript analysis reported in Garrison et al (2001). Fahy (2005) on the other hand adopted the code-recode method before finally generating a CR of 85%.

It was noted by Fahy (2005) that 'the iterative nature of the PI model and the conceptual interconnectedness of the model's phases, provide a promising conceptual guide for researchers studying the "sociocognitive process" (Garrison, et al., 2001, p.11) of interpretation through CMC'. Furthermore, (Oriogun, Ravenscroft and Cook, 2005, p.212) suggested that 'further testing of the practical inquiry model is required to ascertain its robustness and validity' and that 'there is a real need to develop Grarrison et al.'s (2001) framework, especially empirically testing it in relation to actual transcripts of online communications'. The empirical study contained in this article is a way of further testing the PI model in order to ascertain it robustness and validity.

Table 8

Case Study 1 & Case Study 2: Comparison of Oriogun's SQUAD Current Study and Fahy's (2005) Latest Study using the *Practical Inquiry*

Phases of the Practical Inquiry Model		Initial Pilot Study by Garrison et al (2001)	Practical Inquiry Results, Fahy (2005) Latest Study	Practical Inquiry Results, Oriogun's SQUAD Current Study –Case Study 1	Practical Inquiry Results, Oriogun's SQUAD Current Study –Case Study 2
Trigger		8%	9.1%	43%	30%
Exploration		42%	71.6%	33%	16%
Integration		13%	14.1%	0%	18%
Resolution		4%	1.7%	11%	32%
Other		33%	3.5%	13%	4%
	Totals	No of message postings =24 4 Students 1 weeks (Online) Coefficient of Reliability (CR) 83.33%	No of message postings =462 13 Students 13 weeks (Online) Code Recode (CR) 85%	No of message postings =23 4 Students 10 Weeks 3 Days (Online) Categorized by students (no requirement for CR)	No of message postings =80 5 Students 10 weeks 3 Days (Online) Categorized by students (no requirement for CR)
	Course Module	Graduate-level course in Health Promotions (Instructor led)	Graduate-level course in Distance Education (Instructor led)	Postgraduate-level course in Software Project Management (Student led)	Postgraduate-level course in Software Project Management (Student led)

In Tables 8 and 9, we have compared three different courses for the purpose of this study. The initial pilot study by Garrison et al (2001) had 4 students on a graduate-level course in Health Promotions. They posted 24 messages over a one-week duration (the whole of week 9 of the course). The interrater reliability (or Coefficient of Reliability, or Code-Recode, or CR) was just over 83%. For Fahy's (2005) latest study, 13 students on a graduate-level course in Distance Education posted 462 messages over thirteen-weeks, with interrater reliability of 85%. Both Garrison et al.'s (2001) and Fahy's (2005) was instructor led.

In Oriogun's current study, the three cases presented are from a Masters course in Software Project Management. In Case Study 1, four students posted 23 messages online over 10weeks and 3 days in total. For Case Study 2, five students posted a total of 80 messages over the same period, and, finally, In Case Study 3 five students posted 206 messages in the period in question. There was no need for interrater reliability in the case of the SQUAD approach as posted messages were by the students beforehand. Oriogun's current study was student led.

Table 9

Case Study 3: Comparison of Oriogun's SQUAD Current Study and Fahy's (2005) Latest Study using the *Practical Inquiry*

Phases of the Practical Inquiry Model		Initial Pilot Study by Garrison et al. (2001)	Practical Inquiry Results, Fahy (2005) Latest Study	Practical Inquiry Results, Oriogun's SQUAD Current Study –Case Study 2
Trigger		8%	9.1%	24%
Exploration		42%	71.6%	18%
Integration		13%	14.1%	4%
Resolution		4%	1.7%	9%
Other		33%	3.5%	45%
	Totals	No of message postings =24 4 Students 1 Week (Online) Coefficient of Reliability (CR) 83.33%	No of message postings =462 13 Students 13 Weeks (Online) Code Recode (CR) 85%	No of message postings =206 5 Students 10 Weeks 3 Days (Online) Categorized by students (no requirement for CR)
	Course (Module)	Graduate-level course in Health Promotions (Instructor led)	Graduate-level course in Distance Education (Instructor led)	Postgraduate-level course in Software Project Management (Student led)

In Fahy's (2005) latest study and Garrison et al.'s (2001) initial pilot study, the proportions of postings in the categories of *trigger, integration,* and *integration/resolution* are remarkably similar. However, *exploration* was affected by the large number of the fact that 33% of the initial pilot study Garrison et al.'s (2001) was categorised as *other* whilst 3.5% of Fahy's (2005) latest study was categorised as *other*. In Garrison et al.'s study, one of the students acted as a coder of the transcript, and the second coder was hired specifically for coding task. A Coefficient of Reliability (CR) of 83.33% was achieved. In the case of Fahy's latest study, he carried out the initial coding. He then recoded (Code-Recode) again more than two months later achieving 85% CR.

Fahy (2005) noted that most *triggers* originated with the instructor/moderator. This is in line with Garrison et al.'s (2001) study where 74% of the initial study postings were made by the instructor/moderator and 26% by students. In this current Oriogun's SQUAD study, if we discount Case Study 1 because there was no *integration* recorded, Case Study 2 and 3 had all the categories of the PI model recorded. However, Case Study 2 appears to give much better results compared with Case Study 3. The main reason for having the SQUAD categories is that students will be relating more to the first four phases of the PI model, namely *trigger, exploration, integration* and *resolution*. It is expected that the *other* phase of the PI model will probably be

used at the very early stage of students' online discourse, and once they are confident as to how to use the SQUAD tool, they will only be using the first four phases. Case Study 2, typifies the appropriate usage of the SQUAD approach with only 4% postings categorised as *other*.

Case Study 3 however, had 45% of it message postings categorised as *other*, a very large proportion of the 206 message postings overall. This suggests that a number of the students in Case Study 3 were not critically thinking about the problem they were supposed to be solving collaboratively and collectively online for the group's common goal. On the other hand, however, students in Case Study 2 were able to *trigger* discussion (30%), *explore* different ideas and possibility within the group (16%), and consequently were able to *integrate* these different ideas and possibilities in finding solution(s) or *resolution* to the collective problem that they had to solve online (32%). This also tells us that students in this group must have all participated in delivery of various artefacts making up the final deliverable or solution (s) to the software project management problem given to the group to solve in the first place. Table 10 below shows some of the actual messages sent by the five students from Case Study 2. See Appendix for these messages.

Table 10

Actual Messages Sent by Students in Case Study 2

Student	SQUAD Message Number / Category
S7	37 (Question)
S8	39 (Answer)
S6	44 (Delivery)
S5	48 (Suggestion)
S9	64 (Question)
S7	65 (Answer)
S7	69 (Unclassified)

Conclusion

Garrison et al. (2001) concluded that their findings are encouraging, and that they anticipate the PI model could be a valuable tool for researchers and teachers to assess and confirm the nature of the discourse according to their desired learning outcomes. They also stated in their conclusion that they 'remain challenged by the difficulty of measuring latent variables…and by the need to develop tools that effectively deal with large numbers of messages generated during long-term computer conferencing course'.

This current Oriogun's study is one way of addressing Garrison et al.'s conclusion. Two of the three SQUAD case studies presented in this article (Case Study 2 and Case Study 3) both consisted of five students each, posting large number of messages, 80 and 206 respectively over 73 consecutive days (10 weeks and 3 days). The SQUAD results are very encouraging indeed, especially with the consolidation of the cognitive elements of the SQUAD using the *Practical Inquiry* model's cognitive presence as a framework (Oriogun, Ravenscroft and Cook, 2006).

It is argued in this article that a semi-structured approach to online discourse such as the SQUAD framework is more superior to using interrater reliability measurement of online transcripts when

using the *Practical Inquiry* (PI) model to assess critical thinking or cognitive presence of online groups. It is further argues that there was insufficient number of posting (24) by the four students over a period of one week, in the initial pilot study by Garrison et al. (2001) to make any concrete conclusion from the study. The author concurs with Garrison et al's (2001) conclusion 'that the practical inquiry model could serve as a framework for future research in a quest to better understand the cognitive nature of the teaching and learning transaction in an asynchronous text-based conferencing environment'.

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APPENDIX 1

Messages Sent by Students

Student S7 Message 37

Q-Question regarding SDLC? – S7

Wed Jul 19 18:28:31 BST 2006

Hi,

First of all, I would like to say sorry for not keeping in touch. I've got question for S8 regarding the SDLC. According to the project brief, the company specializes in Extreme Programming and RAD methodologies. So I was just wondering if Incremental Model justifies the selection.

Please try to brief us with your justification with respect to the selection of the Incremental Process Model and not any other approach. Because there are various other process models that support XP.

Student S8 Message 39

A-Re: Question regarding SDLC? – S8

Wed Jul 19 19:29:24 BST 2006

Hello S7,

Let me explain key points in SDLC. Company is specializes in RAD and XP so we need to use their strong points when selecting a SDLC. And you know both SDLC and XP favours incremental development. When you go through PFD you can see integration are done incremental. That's why I select an incremental and justify that

S8

Student S6 Message 44

D-Excel file for CPM analysis – S6

Wed Jul 19 20:29:57 BST 2006

Hello

I also uploaded the excel file from which I created the tables in the word file for CPM analysis, if you want to do some small changes S8, but please let me know if there is some large changes from what we have at the moment.

Regards

S6

Student S5 Message 48

S-Amendments to the Business Case – S5

Thu Jul 20 18:35:58 BST 2006

Hi all

There are some changes that I have noted in the business case. I have done them. I think that some areas in the risk analysis should be adjusted and rewritten and some lines should go under cost analysis and other parts. Have done the necessary adjustments.

Hope you won't mind. I have uploaded the adjusted Business case. Please let me know your feedback on that ASAP. Are the changes ok???????!

Please note the changes let me know ASAP.

regards

S5

Student S9 Message 64

Q-Project plan and XP – S9

Sat Aug 05 13:40:33 BST 2006

Dear S7,

I just went through the project plan and budget, and seen that high amount is being spent on requirement analysis. As we are using the XP approach so, is it reasonable to spend such an amount on the specification?

cheerz

S9

Student S7 Message 65

A-Regarding Project Budget and XP – S7

Sat Aug 05 13:46:18 BST 2006

Dear S9,

Thanks for making me aware on the fact. You are right. As we are developing the project using the XP approach, it is not appropriate to spend such a huge sum on the requirements analysis. I'll do something and try to minimise the amount of money being spent there.

Thanks for your expert investigation. Meanwhile, I would also like the other members to put their detective minds at work and investigate the other weak areas that can be improved to minimise the budget.

Thanks for informing me,

Regards,

S7

Student S7 Message 69

U-Business Case – S7

Wed Aug 09 18:38:19 BST 2006

Hi S8,

I've uploaded the business case so that you can append it to the existing PID after careful examination by others and after receiving comments from them.

I would like everyone to go through it quickly and give their expert comments as soon as possible so that we can finish our coursework quickly.

And yeah, best of luck to everyone giving exam.

Cheers,

S7

About the Author

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Dr. Peter K. Oriogun is currently a Senior Lecturer in Software Engineering at London Metropolitan University, United Kingdom. He is the Course Director of the MSc Computing programme offered by London Metropolitan University. His current research interests are in semi-structured approaches to online learning, CMC transcript analysis, software life cycle process models, problem-based learning in computing and cognitive engagement in online learning. He is a chartered member of the British Computer Society. He has over 20 years teaching experience in software engineering, computing and online collaborative learning within Further and Higher Education institutions in the UK, and has extensive publication in this area of expertise. The title of his PhD thesis by prior output is "Towards understanding and improving the process of small group collaborative learning in software engineering education".

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Editor's Note: Dr Siccama conducted a literature research and studied four institutions to determine faculty and staff roles in developing and implementing online programs. She found there was significant collaboration between faculty and staff in course design, production, implementation and evaluation.

Work Activities of Faculty Support Staff in Online Education Programs

Carolyn J. Siccama

USA

An instrumental and collective case study used qualitative research methods to explore the work activities of the professionals who occupy the role of faculty support staff in online education programs. Data was collected from four participants, over a four month period of time, in the form of one demographic questionnaire, two interviews, two site observations, twelve photographs and two Week in Review Activity Logs. Important to the structure and integration of the data collection, management and analysis was the use of QSR NVIVO®, qualitative data analysis software. Results show that the work activities of the participants include the management of the online course development and online course evaluation processes, initiation and facilitation of discussions with faculty about teaching online, building professional relationships with faculty and promotion and creation of networking opportunities among faculty who teach online.

Keywords: qualitative research, online education, faculty support staff, NVIVO, distance learning, work activities, online programs

Introduction

In the traditional model of classroom based instruction in higher education, the responsibility for the design, development and delivery of courses has remained solely with one person, the faculty member (Boettcher & Conrad, 1999). Once faculty enter the realm of online instruction, they quickly realize that they can no longer design and develop their courses alone. Courses that are delivered in online environments require different types of design and development support than do traditional face-to-face courses and it is highly recommended that faculty consult with professionals who are knowledgeable in the technology and pedagogy of teaching online (Boettcher & Conrad, 1999; Hanly, 1998). Such support professionals have been referred to as the key ingredient and the fulcrum in online programs, however, little is known about the specific work activities and the role of these individuals within the context of online education programs (Crang, 2000; Fredericksen, Pickett, Shea, Pelz, & Swan, 1999). The roles of faculty support staff in online programs are considered to be new and emerging in higher education (Davidson, 2003; Gornall, 1999).

Within the past five years, there has been an interest in the study of work activities and roles of new professions in higher education. Research studies from the United Kingdom seem to be primarily informing this area of interest (Beetham, Conole, & Gornall, 2001; Conole, 2004; Oliver, 2002; Shephard, 2004). However, none of the studies emerging from the United Kingdom are specific to online education or distance education programs.

New and emerging roles of service and/or staff positions have been explored from various angles. The analysis of job announcements of instructional technology service positions and educational developers is one way that has been used to identify the types of jobs available and the associated responsibilities and qualifications (Surry & Robinson, 2001; Wright & Miller, 2000). Metaphors, or descriptions that relate the job to other, more commonly known, jobs are often used to describe emerging professions (Surry, 1996). Portfolios have also been used to document professional

experience of faculty developers and educational developers and to provide a rare opportunity to chose how to define roles and responsibilities (Stanley, 2001; Wright & Miller, 2000).

There is also evidence that other professional fields are also struggling to define work activities and roles for professions that are new and emerging in higher education. Disciplines such as library science (Goulding, Bromham, Hannabuss, & Cramer, 1999; Law & Horne, 2004; Rapple, Euster, Perry, & Schmidt, 1997), nursing (Sebastian, Mosley, & Bleich, 2004), educational technology (Davidson, 2003), corporate training (Aragon & Johnson, 2002), educational development (Wright & Miller, 2000), information technology (Thompkins, Perry, & Lippincott, 1998) and instructional technology (Guernsey, 1998) have clearly documented the challenges they face in defining new roles in their respective disciplines.

Specific to online and distance education, studies have attempted to identify broad categories of roles (Hanrahan, Ryan, & Duncan, 2001; Wright & Miller, 2000), identify lists of the most important roles in distance education (Thach, 1994; Williams, 2003), use anecdotes to describe roles (Fredericksen et al., 1999) or identify conceptions of roles (Inglis, 1996). It is not until we know about the work activities, or work content, of the professionals who occupy roles of faculty support staff we cannot begin to speculate about their roles (Mintzberg, 1973).

What's missing is any literature to support the categories and perceptions which have emerged. Are the perceptions really an accurate indication of what these individuals do? Looking at studies of emerging roles across many different professions provided important insights into methods, techniques and challenges for this research study in defining and studying work activities.

Research Question

The research question shaping this study was: What are the work activities of the professionals who occupy the role of faculty support staff in online education programs?

Overview of Methodology

A qualitative collective case study approach was used as the research method to document the work activities of individuals who occupy the role of faculty support staff in online education programs. The unit of analysis was the content, or work activities, of the individual faculty support professional. Four professionals who occupy the roles of the faculty support staff within four different online education programs were studied. The 4 participants work at two or four-year postsecondary institutions in the northeastern region of the United States that offer asynchronous online courses (graduate or undergraduate) over the internet. Participants of the study were from institutions where the faculty members conduct their own course development, with the assistance of the faculty support staff, and there is an existence of a structured faculty support and training program for faculty who teach online.

The faculty support professionals who participated in this study work directly with faculty members in any or all aspects of online course planning, design, development and delivery. Three additional criteria used to select participants included those who work full-time, have a minimum of twelve months experience in their role conducting faculty support (Inglis, 1996) and, work in a support/service position versus a faculty position (Shephard, 2004).

By employing a collective case study approach (Stake, 1995, 2003) five types of data were collected: 1) demographic questionnaire, 2) interviews, 3) site observations, 4) visual data, and 5) Week in Review Activity Logs. Such variety of data collection techniques allowed me insight into their professional daily lives to aid in describing their work activities within their respective online education programs.

Data Management and Analysis with NVivo®

A data management strategy was established early within the NVIVO qualitative research software which allowed for frameworks to be established for data management, organization and analysis. This structure of data management allowed for simultaneous data collection and interpretation as the research process unfolded (Creswell, 1994). Richards (2004) documents four methods in which NVIVO can serve to ensure the appropriate data are used, the inquiry is thorough and the best possible outcome is achieved. These four methods, used extensively in this study to help assure validity and trustworthiness, include the maintenance of audit and log trails, interrogation of interpretations for sound inquiry, the scoping data and establishment of saturation for robust explanation.

Findings: Background of Participants and their Online Programs

The context and work environment within which the faculty support staff work plays an important role in the type of work activities they conduct.

Background of the Participants' Online Programs

Defining the work activities present in online education in higher education varies depending on the institutional environment, particularly related to the distance education model being implemented (Clay, 1999; Smith, 2004; Williams, 2003). Two main categories of information emerged that illustrate a 1) general overview and background of each of the four online programs (see Table 1) and, 2) the institutional approach to course development and training (see Table 2).

Table 1

Background information related to online programs

Name	Institution	Age of online program	# certificates	# courses	# online degrees	Level of Program	Length of courses
Sally	Maple State College	1998	2	40	3	Grad and Undergrad	14 weeks
Lynn	Oak University	1997	4	124	35	Grad and Undergrad	8 weeks (UG), 11 weeks (G)
Lisa	Willow Community College	1999	1	72	2	Undergrad only	14 weeks
Dina	Cedar College (Private)	2002	26	49	0	Undergrad only	3 weeks to 12 weeks

Table 2

Institutional approach to course development and training

Name	Course Expectations Prior to Teaching Online	Length of Training	Training Format	Learning Management System	New courses per semester or term
Sally	Complete course online	7 modules, 6 weeks	Self-Paced Online Tutorial, one-to-one, asynchronous instructor led	Blackboard	1-2
Lynn	1 week online	8 weeks	Asynchronous instructor led One-to-one	Blackboard	3-4
Lisa	Complete course online	6 weeks online (9 month development process)	one on one and asynchronous online	Blackboard	2-5
Dina	Complete course online	Author: 4 weeks Instructor: 8 weeks	One-to-one, online showcase & print manuals, group sessions	Proprietary	3-4

Background Information of Participants'

All 4 study participants were female, however, gender was not specified as part of the study criteria. All participants were Caucasian. Every participant had been working in their current position from two to four years. Three of the four participants had supervisory responsibilities in their current positions, supervising both full and part time staff and student staff (i.e. work study students). Participants report that they supervise between one and four-and-one-half staff and one to three students.

In regards to education, all four have Master's degrees. Professional development of each participant takes various forms. All participants aim to keep up to date and current on trends in the field of online education by reading print and electronic publications, joining professional organizations, joining email list serves and attending conferences. None of the participants have ever contributed articles to any of the publications that they read on a regular basis. A few participants are active members within various professional organizations such as the United States Distance Learning Association and the North East Regional Computing Program (NERCOMP).

Details of Participants Work Activities

Table 3 provides details on participants work activities that reflect "somewhat typical" weeks as documented by 7 of the 8 activity logs.

Table 3

Emails, Phone Calls, Meetings and Working Hours

Name	Week of Semester or Term	Email replied to	Email Received	Phone Calls received	Scheduled Meetings with Faculty	Unscheduled Meetings [a]	Worked Evenings?
Sally	Week 9	147	83	A few	3	0	Yes
	Week 14	250	275	7	0	0	Yes
Lynn	Week 2	100	250	10	0	2	Yes
	Week 7	150	250+	10	3+	0	Yes
Lisa	Week 10	50	50	18	3	0	No
	Week 15	90	110	38	1	6	No
Dina	Mid to near end of term	79	117	12	1	5	Yes
	In between terms	94	122	12	0	2	No

[a] Unscheduled meetings are informal meetings that take place in the hallway, restrooms or when someone drops into their office looking for assistance.

Findings

Five findings emerged as a result of the data analysis.

1. Managing the Process of Online Course Development

Faculty support staff work with many different types of faculty at any one time. In managing the course development process, they are managing, organizing, and keeping track of the progress of faculty who are at various stages of online course development.

The spectrum of faculty that the faculty support staff may work with or keep track of at any one time is very broad including faculty interested in teaching online, potential faculty (not hired yet), full time and adjunct faculty hired to teach online, experienced online faculty, those in training, those scheduled to teach in future, those scheduled to develop subsequent online courses, those beginning to teach, those currently teaching and those wishing to update or revise existing online courses. Faculty support staff do not manage the course development process alone and the visual data provided rich insights into the important role of teamwork.

Various strategies are used to manage the logistical details that are inherent in such complex systems such as timelines, checklists and meetings.

Timelines and Checklists

It was very interesting to find that all 4 participants have created and use some type of timeline or checklist to share with faculty. Such tools are given to faculty to help them to better understand the various milestones or action items expected of them during the online course development process, and as a way for faculty to help manage and plan their own course development progress.

Meetings

Meetings become an important way to manage the online course development process. Depending on the model of the online education program and the type of training that is offered, two different types of meetings were reported, 1) meetings with faculty and, 2) meetings with staff. The meetings that the faculty support staff have are not always in the traditional format of sitting down at a table and meeting. The visual data provided powerful images that allowed unique insights into the work activities of the faculty In managing the course development process, there is much technical and system administration work that happens, as Sally notes, "behind the scenes". Faculty may or may not be aware of the work done behind the scenes, but it is a very important part of supporting faculty in their online course development process. All 4 participants report that part of their work involves managing relationships with Blackboard and/or in the case of Dina, she works closely with her technical team to improve, build and update their proprietary Learning Management System support staff. For example, photo 1 shows a picture that Lisa took of a hallway and noted that a lot of her meetings, conversations and consultations occur in this hallway.

Photo1. Lisa's Hallway

Challenges

Working with such a diverse groups of faculty is not without its challenges. Early in the course development process Lisa finds that sometimes there is confusion about her institutions' nine month timeline and expectations for developing an online course. During the training component of the online course development process, many challenges seem to emerge. Lisa shares that she has had problems with faculty retention in the online course because they may get discouraged while taking the online course. She is hoping that meeting with them one time during her newly revised six week training course will help address the faculty retention issue. It is challenging for Dina to work with difficult authors (faculty) who don't follow the agreed upon course development deadlines. Lynn's challenges are more around institutional policy issues. "We don't offer development money, but at the same time it is a best practice to really have that class developed before" the term begins (Lynn).

Work Activities behind the Scenes

In managing the course development process, there is much technical and system administration work that happens, as Sally notes, "behind the scenes". Faculty may or may not be aware of the work done behind the scenes, but it is a very important part of supporting faculty in their online course development process. All 4 participants report that part of their work involves managing relationships with Blackboard and/or in the case of Dina, she works closely with her technical team to improve, build and update their proprietary Learning Management System.

2. Managing Course Evaluation Processes

The course evaluation process often takes place at the end of the semester or term, when online students have access to complete an anonymous course evaluation about the course they are completing online. A second theme that emerged, related to course evaluations, is the work that the faculty support staff do to solicit feedback related to the structure of their training approaches and training courses.

Online Course Evaluations.

The work that the faculty support staff do related to online course evaluations is varied. The support staff role within the course evaluation process may involve managing the logistics in making sure that the course evaluation gets posted at the appropriate time in the semester or term, they may do the actual data analysis of the evaluation results, and/or they are involved in making sure the results get distributed to the appropriate campus administrators and to faculty.

Training Course Evaluations.

The faculty support staff actively solicit feedback from faculty about how they can improve their training programs. For example, at two points during her online training course Lisa solicits feedback from faculty on the structure, assignments, readings, content of the course, the experience, the facilitators and the strongest and weakest aspects of the course. As a result of this feedback, in addition to her observations, Lisa is revising her current training course by shortening it two weeks and instituting a mid-course meeting with faculty.

3. Initiating and Facilitating Discussions about Teaching Online

Faculty support staff are very involved in discussions about teaching online including, 1) Initiating Discussions and, 2) Facilitating Discussions with faculty. While these conversations are happening at many levels with higher education, it is the faculty support professionals who work directly with the faculty who are prompting and having many of these 'front line' conversations, both synchronously and asynchronously, with faculty.

4. Building Professional Relationships with Faculty

Interwoven within the descriptions of their work activities, each participant clearly described the importance of building relationships with faculty throughout the online course development process. The support staff clearly articulated some behaviors they enact when facilitating the support of faculty who are in the process of designing, developing and teaching online courses.

The professional relationships that staff develop with faculty is a delicate and negotiated role (Fredericksen et al., 1999), and the participants in this study recognize the importance of this role. There were two distinct points in time that are critical to the building of professional relationships with faculty. The first is the first contact with faculty and the second is all subsequent contacts with faculty. The first contact is defined as the first meeting or phone call that participants make with a new or potential faculty member who may teach online at their institution.

After the first contact there are many different types of behaviors that participants perform as a way to continue to build their relationships with faculty. Five categories were created "in vivo" which is defined by Richards (2005) as "categories well named by words people themselves use" (p. 95). The five categories include:1) make faculty feel comfortable, 2) listening, 3) meet faculty needs, 4) patience, and 5) follow through.

Making Faculty Feel Comfortable

Three of the four study participants used the term *comfortable* during the first interview when referring to how they like to make faculty feel when they are working with them. In particular,

the points in time when the support staff aim to make faculty feel comfortable is right before and right after the semester or term begins, particularly those faculty who are teaching online for the first time.

Listening

Listening to faculty's needs and concerns around the development and teaching of their online course is one way in which the faculty support staff build credibility and rapport with the faculty. Lynn specifically identified various ways she builds credibility and rapport with both full time and adjunct faculty, "for full time faculty it is meeting with them on staff, it's talking with them what they think, listening to them, for our adjuncts it is having that first interview call where we talk and I listen to them" (Lynn). Throughout the process of working with both course authors and instructors Dina affirms that it is "listening to them, being caring, and supportive of them" which is important in building their trust. Once faculty begin teaching their online course they often return to Sally for suggestions or feedback on how they can improve the organization of their course. At this time Sally considers herself a "sounding board" for faculty.

Meeting Faculty Needs

The data suggest two categories in which the faculty support staff work to meet the needs of the faculty who are teaching online. They strive to meet the learning needs and the technology needs of faculty. All 4 study participants aim to understand how faculty learn and will adjust their teaching style to fit the learning needs of faculty. For example, Dina may go to the office of a faculty member to help them since it is easier for the faculty member to work and learn from their own computer. Lisa talks about "meeting them where they are and bring them along".

Another important consideration when working with a faculty member who is developing or teaching online is to be able to meet their technology needs. Participants often spoke about finding out what the faculty needs are in relation to technology and getting them the resources, tools and support they need to meet their needs.

Patience

One behavior mentioned by all participants is patience. Participants described how they use the virtue of patience in the many different spaces in which they work including in person, over the phone or asynchronously during an online training course.

The importance of having patience with faculty especially in relation to technical issues was commonly mentioned. Sally talks about working with faculty to post materials into Blackboard, the Learning Management System used at her college. She noted that "if it takes all day, to post an item, or it takes five minutes, I am going to make sure that when they leave they are comfortable with whatever it was that they were trying to achieve."(Sally).

Follow Through

Follow through is defined according to specific words or phrases that the participants shared with me such as "always being there", "getting back to them on time", "delivering on what you say you will do", and "follow through" . It is through such actions that relay to the faculty that their specific institutions are serious about providing them adequate support staff and resources so they can effectively teach their course online. Such interactions may result in what Fetzner (2003) calls the unanticipated impacts of faculty support in online programs which is the building of credibility and rapport between faculty and staff.

5. Connecting Faculty to other Faculty

In addition to building professional relationships between themselves and the faculty members, faculty support staff spoke frequently about and provided evidence for how they promote and

create networking opportunities, both asynchronously and synchronously, among faculty who teach online.

Asynchronously

All 4 participants facilitate and/or provide access to some type of self-paced or instructor led asynchronous online training course which is required for faculty to complete prior to teaching online. Each of the training formats include samples and models of relevant course materials that have been developed by faculty at their respective institutions.

Lynn affirms the importance of connecting faculty with other faculty, especially "if an instructor is teaching face to face and needs to start developing and teaching online, the most powerful way for them to really start grasping it is to see what their peers are doing" (Lynn). She is also extending the networking beyond the training course. Lynn is currently building out resource areas, or Online Communities of Practice, which is an initiative to help make stronger connections and relationships between the adjunct faculty and full time faculty at her institution.

Synchronously

Even though a lot of the work that the support staff do with the faculty are online in the training courses or via email, there is still a strong existence of working one-to-one and face-to-face with the faculty. Participants often spoke about various workshops they have for faculty. Common characteristics of these workshops are they are informal, offer refreshments or lunch, and they are created so that faculty have an opportunity to talk and share their experiences. If the workshops are technology related they may be led by one of the support staff since it is more of a technology "training" session. If the topic of the workshop is pedagogy focused, the faculty support staff will often have faculty develop and/or facilitate the workshop. These may take the form of a show and tell, sharing a success story, or a specific topic related to online teaching, such as building interactivity into an online course.

Lynn and Dina both mentioned that if a faculty member is "having trouble grasping" (Lynn) or "struggling with something" (Dina) this is when they would take the opportunity to connect individual faculty with other faculty. As Dina states, "if they relate well to somebody on campus who has gone through this experience we'll encourage them to talk to them".

Looking Across the Findings: A Discussion

Three significant outcomes resulted in connection to my inquiry. The findings show evidence that the nature of the work of faculty support staff occurs at three distinct levels: 1) at the course level, 2) at the program level and 3) within an institutional environment.

Figure 1 depicts an image that was constructed to visually represent the space within which the participants conduct their work activities, and also to represent the cyclical nature of their work.

The core of their work, as depicted by the inner most circle, takes place at the course level, providing support to faculty during any and all phases of online courses including training, planning, designing, development and delivery. The faculty support staff keep track of various nuances of each course and/or how each faculty member teaches their course. It almost becomes a type of customized support for faculty and this becomes a critical element in supporting the necessity of faculty support within online education programs. It is the faculty support staff who are the individuals who become most familiar with the courses, how they are set up, how faculty members teach their courses, and what tools they use. In another cyclical, but related, space is the cyclical nature of course development and evaluation process. Participants manage the online course evaluation process as a way to constantly strive for continuous improvement of their institutions online courses and program.

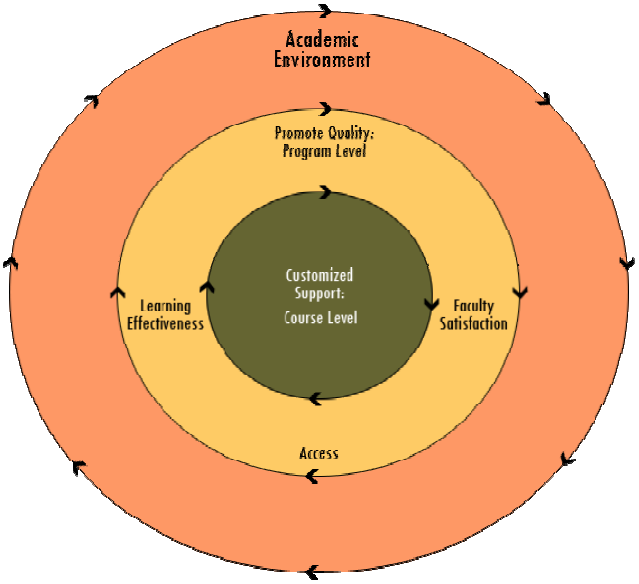

Figure 1. Space within which faculty support staff conduct their work activities

The middle ring of the circle depicts another layer within which the support staff work - promoting quality at the program level. The faculty support staff work at various levels to promote quality in areas such as promoting online interaction, having comprehensive approaches for evaluating courses, providing appropriate learning management systems, building in opportunities for faculty to share their experiences, practice and knowledge, and providing technical support and training.

The five types of data collected in this study provided clear evidence that the faculty support staff promote quality in three of the Sloan Consortium five pillars of quality including, 1) learning effectiveness, 2) access and, 3) faculty satisfaction (Moore, 2005).

The outer ring of the circle depicts the academic environment within which the faculty support staff work. The work of the faculty support staff ebbs and flows within the cyclical nature of the semester or term, and meeting faculty needs at various times throughout the semester or term. In talking about the cyclical nature of her job, Sally refers to the type of questions she handles depending on the time of the semester "that the type of questions may change, but the activities still need to keep going," and "it just keeps going round and round and round."

Conclusion

The work of the faculty support staff has far reaching implications within their respective institutions as they work closely with not only faculty, but with colleagues, administrators and students to build and grow the number of courses and their respective online education programs. The individuals who occupy the roles of faculty support staff in this study *understand* online education. They are in unique roles that require an understanding of the broader issues related to online education and the data suggests that they do understand the complexities inherent in online education. Parallels can be drawn to what Gornall (1999) identified in her research on new professionals in higher education, that their roles can be regarded as marginal, yet powerful, in they can be associated with institutional change and long term institutional strategy.

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Editor's Note: Nursing education is building its own online learning communities to expand opportunities for learning. The focus is on interaction through interviews, shared experiences, group assignments, and dialog.

Qualitative Assignments to Enhance Online Learning

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USA

Abstract

Rapid advances in online education bring new focus to online teaching and learning strategies. As faculty seek best practices to design online learning experiences, familiar tools can be applied in new ways. Qualitative tools such as interview and observation provide a beginning toolkit for developing authentic and meaningful applied assignments. A student-focused online learning community evolves as students share experiences and build meaning from the assignments and discussion. Strategies, benefits, and sample online learning assignments using qualitative tools are shared.

Keywords: online learning, learning community, web-based teaching, online education, teaching with technology, e-learning, online teaching, online education, online assignments, applied learning assignments

Introduction

As online education flourishes, questions emerge as to how one best teaches to engage students for learning in an online classroom. As faculty seek expertise with new technologies and determine best practices for designing online course assignments, familiar tools can be applied in new ways to promote online learning. While assignments using qualitative tools such as interviews and observations are not new, these tools are used in different ways in an online setting to help students become familiar with course content and to develop an online learning community.

Qualitative tools provide a beginning toolkit for developing assignments that can be authentic and meaningful. Well known qualitative tools such as interview and observation bring real world experience to students who are learning online and provide building blocks for assignments that can be shared with online learning communities. Expanded experiential activities are considered key to online learning (Fink, 2003).

This article shares strategies and benefits in using qualitative tools to develop online learning assignments. Sample assignments from an online nurse educator certificate program are shared.

Background: Online Teaching and Learning

Rapid advances in online education bring new focus to teaching and learning strategies. The pedagogy of online teaching versus the technology itself is an important focus for educators (Billings, Skiba, & Connors, 2005; McKeachie & Svinicki, 2006). Qualitative tools such as interview, observation, and document review work particularly well in developing online assignments that promote student centered active learning when faculty are not physically present. Assignments using qualitative tools complement technology, bringing a humanistic component to online education. Students benefit as they relate their coursework to these applied "real world" experiences.

Good educational practices suggest the need to use a variety of teaching strategies to meet the needs of varied learners (Billings, Skiba, & Connors, 2005). Using qualitative tools for learning assignments includes bringing applied activities and "lived experiences" to the online classroom,

broadening the learner's scope from traditional online learning activities. As multiple teaching methods are used, more students with diverse learning styles benefit. These authentic qualitative assignments are consistent with the constructivist philosophy of establishing a student focused learning environment (Savery & Duffy, 1995) as well as adult learning theory in making content relevant and applied (Knowles,1984).

Providing a classroom observation assignment, for example, to accompany readings about a particular topic such as student diversity issues, class participants will not only read about these issues, but also gain personal perspectives on the topic from observation. As participants share observations in online discussion, students in many classrooms have opportunity to learn by exploring a variety of ideas and theories. An online learning community evolves as students from a variety of settings share experiences and build meaning from assignments.

Qualitative Tools for Online Course Assignments

The assignments described in this paper have been used over the past five years in online nurse educator courses. Assignments are consistent with nurse educator course objectives seeking student knowledge and experience specific to teaching strategies; teaching with technologies; and course and program planning. The assignments have been evaluated as part of course evaluations and all received high ratings by the student learning community. The program is detailed further by Bonnel, Starling, Wambach, and Tarnow (2003).

Table 1 shows sample assignments based on interview, observation, and document review as part of the online nurse educator program. The role of interview, observation, document review and other qualitative approaches includes a sample process for implementing assignments.

Interviews

Qualitative interviews are flexible and powerful tools that can provide windows into diverse experiences (Britten, 1995). An interview assignment (such as interviewing a nurse educator with over 10 years of experience) provides online students an opportunity to converse with an individual about a specific assigned topic and then compare/ contrast interview data to class readings and student colleague experiences. By interviewing practicing faculty or clinicians, students gain practical expertise from colleagues' years of knowledge and experience. Students reflect as they review and write up interviews. Critical thinking and further inquiry are enhanced as additional questions are generated (Brookfield & Preskill, 2005).

Sample benefit to learning community. As students share completed interviews at an online discussion, the student learning community benefits from reviewing and responding to these diverse interview summaries. For example as part of a faculty interview assignment about curriculum, students gain information from faculty in different professions, different specialties, different sized schools, and from both rural and urban settings. Nursing faculty who teach in programs varying from basic certificates to advanced degrees share knowledge with students. As several students have noted, it would not be possible to readily gain information from this diverse range of individuals.

Observations

Observations allow opportunities to view activities in natural settings (Warren & Karner 2005). An observation assignment (such as participant observer in a classroom or curriculum planning meeting) provides students opportunity to confirm concepts and processes that they are learning about in readings. As students view local classrooms and clinical agencies, they gain information about the roles, practices, and strategies of people they observe and also consider the setting structure and processes. Course content and readings make more sense as students experience concepts in action.

Table 1

Sample Qualitative Assignments

Sample Interview Assignments

Faculty Interview, "Technology": Identify a faculty member with several years of online teaching experience and interview this person with respect to online teaching issues. Sample interview questions include: What teaching strategies do you find most effective in these courses? What were some of the challenges for you in getting started with web-based teaching? What have been some of the positive experiences in teaching with web-based technology? What are some ways you deal with feedback to students and time management issues?

Faculty Interview, "Curriculum": Identify a "seasoned" faculty member with experience in course and program planning to better understand the "lived experience" of course and curriculum planning. Suggested probes to begin the interview include: What are your experiences with the curricular process? What are your experiences using evaluation data to help make curriculum changes? What are your experiences with curricular strategies for melding theory and clinical?

Sample Observation Assignments

Learning Lab Observation: Observe a clinical learning lab during a class session. Using a "people-place-process" observation model remember to consider who is present, what the environment and resources are like, and what teaching/learning processes are occurring specific to the clinical skills being observed. After identifying strengths and weaknesses of the setting and processes, list what recommendations might be made.

Planning Meeting Observation: Observe a curriculum or planning meeting using a "people-place-process" observation model to identify the dynamics and hierarchical arrangements within the course and curriculum planning meeting. Include observations such as: Who makes up (and attends) the committee meeting? What is the process for reviewing curricular materials? What is the process for approval/disapproval of materials? What helps or hinders attainment of the agenda?

Sample Document/Resource Review Assignments

Course Syllabi Review: Compare and contrast two course syllabi for web-based courses. Are there major differences as to how these courses are designed? Does one format seem to have advantages over the others? After reviewing the two, select one syllabus to further critique using guidelines provided.

Handbook Review: Review the table of contents for two selected student handbooks to identify the types of student issues covered. Select an issue or problem area you would like to think more about such as cheating or absence policies. Compare and contrast the two handbook policies specific to the identified problem. Are there major similarities or differences? What do you find that surprises you?

Sample benefit to learning community. After completing and sharing a clinical learning lab observation in an online discussion, students note the differences between various clinical labs' resources. They report clinical teaching lab devices ranging from simple mannequins in some settings to expensive electronic patient simulators and standardized patients in others.

Students also note differing teaching processes such as variations in clinical skills exams. Critical thinking is evidenced in online discussions as the online learning community generates questions such as what clinical lab structures and processes are best and what further evaluative research is needed specific to best practices in clinical laboratory teaching.

Document Review

A common qualitative research approach reviews and analyses documents (Warren & Karner 2005). Students review documents such as online course syllabi, online college handbooks, and specific web resources to consider similarities and differences between various programs and schools. This non-intrusive review strategy provides online students with information from numerous text-based presentations not readily available in the traditional classroom.

Sample benefit to learning community. As students share completed summaries from an assignment incorporating a structured review of selected student handbook policies, students often express surprise at the similarities and differences between varied schools' policies. Students gain knowledge beyond their own school resources and extend the conversation to broader legal and ethical issues in student handbooks. They extend their learning by generating further questions and discussion about program variations and guidelines specific to student professional behaviors and practices such as cheating and student absences.

Additional Qualitative Tools

Reflection and writing, common qualitative tools, are used as students complete assignments and share assignment summaries at online discussions. Reflection can enhance self-evaluation skill as students build on previous experiences and reflect on how an assignment contributed to their learning. Students use reflection to help bridge the theory and practice divide (Freshwater, Horton-Deutsch, Sherwood & Taylor, 2005).

Sharing reflections and written assignment summaries via online discussion allows students opportunities for peer response and critique. Numerous small observations that each student contributes about a topic add up to make a larger, more complete picture of a concept or issue. Written questions and feedback from other group members promotes further reflection. Students learn class content as shared from varied settings and contexts. Learning extends beyond the traditional classroom, enhancing the online learning community. Palloff and Pratt (1999, 2005) noted that the best learning opportunities in online education often come from reflection and interaction as part of an online learning community.

Sample Process for Implementing

All assignments have been developed for courses that are completely online. Processes used for implementing the assignments include the following:

- Students are given broad guidelines for each assignment (i.e. suggested beginning questions for interviews and models for organizing observations).
- Specific information is provided in the course syllabi as to how each assignment contributes to course outcomes.
- Faculty assist students to identify mentors and access settings for observation or individuals for interviews as needed.
- Course faculty provide scheduled introductory comments to each assignment via email, setting the stage for the learning activity.
- The majority of students' assignments are shared in summary format at an online discussion for student review and response.
- Following the online discussion of the assignment, faculty provide an email summary of the discussion's key themes gained from simple content analysis of the discussion.
- Simple rubrics are used to assign student grades for completion of the activities.
- Assignments are evaluated as part of course evaluations

Further Considerations

Technology has been described as a unique opportunity to help students gain knowledge beyond the traditional classroom (Ehrmann, 2004). Assignments using qualitative tools, appropriate for many types of courses, can incorporate diverse student needs and different learning styles to benefit the online learning community as a whole. From the discussion of assignment summaries shared, class members help each other achieve course outcomes via the online learning community. While changes in online educational technology will continue, the assignments discussed have broad scope and can have continued relevance.

Further evaluative research of online teaching and learning strategies in general is needed; however, the tools and assignments shared have been successfully used with diverse student groups in online nurse educator courses. Positive satisfaction scores were received on traditional course evaluations; course documentation; and a standardized online learning benchmark tool. Evaluation data from 108 graduate nursing students who completed online nurse educator coursework noted increased expertise, experience, and confidence as nurse educators.

Qualitative tools can be used to design meaningful active learning assignments that engage students taking diverse online courses. Faculty gain an assignment toolkit based on well known tools. Students gain real world experiences that can be shared to further benefit the online learning community. Using selected qualitative tools as components of applied learning assignments can be timely, efficient approaches to enhance web-based teaching and online learning.

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