Using Blackboard in an Educational Psychology Course to Increase Pre-service Teachers' Skills and Confidence in Technology Integration

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Abstract

An important education issue that needs to be addressed in teacher education is the gap between the continuing and increasing technology demands placed on new teachers entering K-12 classrooms and the training that they receive during their college years. There is evidence that not only are new teachers lacking the technological skills, they also lack the confidence needed to motivate them to expand their technological abilities. There is concern that many school of education faculty are not effectively modeling the use of technology to pre-service teachers in education courses. This paper investigates how the incorporation of the Blackboard Learning System, with its expanded communication and hands-on features, helps pre-service teachers to gain confidence in integrating technology into their future teaching. In addition, it documented how students and professors think the use of a course management system helps students' learning. It will also provide guidance for the effective use of a web-enhanced learning system.

Introduction

An important education issue that needs to be addressed is the continuing and increasing technology demands placed on new teachers entering K-12 classrooms. Many school district administrators expect that the new teachers exiting teacher-education programs have the skills to easily integrate technology into their lessons to improve the learning of the K-12 students in their schools. However, there is evidence that not only are new teachers lacking the technological skills, they also lack the confidence needed to motivate them to expand their technological abilities.

Concurrently, there is concern that many school of education faculty are not effectively modeling the use of technology to pre-service teachers in education courses. One form of technology that is available and is expanding on college campuses is the use of Web-based environments such as "Blackboard" and "Web-CT" which allow students access to course materials, lecture notes, assignments, and web site links. These course management systems also allow college faculty and pre-service teachers to interact within education courses via technology. In particular, the "Communication" sections of these Web-based environments are often one of the more frequently used components.

The purpose of this study is to investigate the connection between pre-service teachers' confidence in integrating technology into their teaching and the use of Blackboard, a web-based learning environment. Another purpose of the study is to investigate how the

"hands on" nature of using technology via Blackboard affects pre-service teachers' confidence in using technology to create technology-based lessons.

Literature Review

Researchers and practitioners have reported that effective technology integration in teaching motivates students' interest in learning, increases students' high level learning, such as problem-solving and complex reasoning skills, and promotes significant students' learning gains (Dwyer, 1994; Kimble, 1997; Lazarowitz, 2002; Lingnar, Hoppe, & Mannhaupt, 2003; Salpeter, 1998; Wheeler, Waite, & Bromfield, 2002; Wishart & Blease, 1999).

However, the National Center for Education Statistics (NCES) (1999) has reported that only 20% of teachers believe they are prepared to integrate technology into their classroom instructional practices. In 2000, NCES reported that 50% of the teachers who had computers or the Internet in their classrooms reported using them for some type of classroom instructional practices. However, a majority of these teachers used them mostly for word processing or spreadsheet applications. Only one-third of the teachers felt they were well prepared to use computers and the Internet. Of these teachers, 93% reported that this was due to their independent learning rather than through formal college instruction in how to effectively integrate technology into their teaching.

Albee (2003) in her study investigated teachers' technology skills and the expectation of administrators at schools for new teachers to have technology skills. She found a discrepancy between what the administrators expected from the pre-service teachers and the pre-service teachers' actual technology skills. She also found that college faculty integration of technology directly impacts student teachers' use of technology and their confidence of technology integration in their instruction. Hill and Somers (1996) and Queitzsch (1997) contend that preparation of pre-service teachers to use and integrate technology in their future classrooms needs to be emphasized. Colleges of education should provide opportunities for pre-service teachers to observe the modeling of effective uses of technology by faculty and to use this technology in a supportive environment.

In addition, Martin and Briggs (1986) believed that computer confidence is highly correlated with computer anxiety and attitudes toward computers. Pre-service teachers' confidence levels were increased by being exposed to the technologies while learning teaching practices in their method courses and seeing the technologies modeled by the faculty (Bohlin & Hunt, 1995; Hill & Somer, 1996; Pope, Hare, & Howard, 2002). Ayersman (1996) reported computer anxiety is prevalent among pre-service and practicing teachers and many suffer at substantially high levels. Bradley and Russell (1997) found that computer anxiety was highly and negatively correlated with self-rated computer competence. Prior computer learning experience was reported to be important and independent determinants of both computer anxiety and computer competence.

Gunter (2001) reported that students had significantly less anxiety after completion of a redesigned Web enhanced course which provides continuous technology modeling, and an authentic learning environment. Such courses are often supported by course-management software, such as Blackboard and Web-CT. Gunter found that students entered institutions of higher learning with lack of proper computer, information and integration skills. However, she claimed that higher education faculty who use a variety of innovative teaching and learning strategies that they effectively model can promote the use of technology best by

integrating it into their own instruction. Pre-service teachers' anxiety was greatly reduced and they were encouraged and inspired to use technology in their future classrooms.

These research studies are consistent with constructivist principles of learning that hold that meaningful learning occurs in the active exchange of information and ideas by individuals. As Mayer (2003) suggests, learning should be meaningful rather than rote, instruction should be student-centered rather than curriculum-centered, assessment should be focused on transfer of learning in addition to retention of knowledge, and the approach to using educational technology should be learner-centered rather than technology-centered. Thus, technology-based instructional features that increase dialogue and communication among students, as well as between students and teachers, should increase pre-service teachers' depth of knowledge and their ability to transfer that knowledge into their future teaching experiences.

Online discussions can offer many benefits to students. Asynchronous, computer-mediated, many-to-many communication, online class discussions are claimed to be able to offer students opportunities that no other media can (Harasim, 1987). Research studies reported that online class discussion affords students a democratic environment (Hiltz, 1994). No one student or instructor can dominate a discussion. Less assertive or shy students feel less intimidated in participation of the discussion and feel more comfortable in expressing their opinions online (Kamhi-Stein, 2000; Warschauer, 1997; Yi & Majima, 1993). Many students reported that they had more communications with their instructors and peers in online classes than in traditional, face-to-face class discussions (Schutte, 1996; Turgeon, Biase, & Miller, 2000).

At the same time, online discussion with its asynchronous feature provides students with the opportunity to reflect on their peers' contributions while creating their own, and on their own writing before posting it. Therefore it is argued that online discussion tends to create certain mindfulness and a culture of reflection (Harasim, 1990; Hiltz, 1994). Actually, Garrison (2002), Jonassen, Davidson, Collins, Campbell, & Haag (1995), and Wells (1992) argue for the unique capability of asynchronous online discussion to support both reflection and collaboration. It has the potential to significantly enhance the intellectual quality of learning environments and outcomes. As Woolfolk (2004) and Zeichner & Liston (1996) point out, one of the roles of teacher education programs should be to prepare pre-service teachers to be reflective-practitioners, that is, to continually reflect on how they teach to improve their instruction so that students in their classes may learn more effectively. Thus, online discussions should contribute to this effort by increasing pre-service teachers' opportunities to get feedback from their peers and course instructors about their ideas and use of technology.

Some recent studies regarding pre-service teacher education reported that online discussion expanded and enhanced class discussions and built an intellectual, collaborative network (Bonk, Daytner, Daytner, Dennen, & Malikowski, 2001; Mayer, 2002; Slavit, 2002). Slavit (2002) in his study investigating an online communication package reported that students perceived that asynchronous online discussion extended class discussion. The online discussion area provided them opportunities to develop their understanding of the course related issues. While students were able to initiated and react to various ideas, assertions, and questions, the discussion stayed more focused with the instructors' facilitation. Slavit concluded that electronic discussions were beneficial to the reflective and communicative processes of pre-service teachers. They extended and enhanced classroom discussions. Mayer

(2002) also reported the benefits of online discussion for pre-service teachers, such as linking them with colleagues and friends for personal and professional support, an avenue for them seeking advice and ideas on their teaching practicum, and an effective and time efficient way of communicating. At the same time, she also pointed out the challenges for teachers, students and the universities.

Indeed, Bonk et al. (2001) also found that in online discussion students' contributions tend to be more thoughtful. As an extension of classroom discussion, instructors can provide efficient and organized advice while learning the current common problems and issues in K-12 classrooms. Through online discussion, students get access to multiple perspectives on different issues, something not in the textbook or lecture. In addition, students' learning was enhanced when pedagogical and technological aspects of online discussion were combined. Again, from a constructivist perspective, the sharing of multiple perspectives should increase the depth of understanding that pre-service teachers develop regarding effective instruction.

In addition, confidence of technology integration in teaching is still a central issue in pre-service teacher education. School administrators are expecting more technology skills from new teachers. They have concerns regarding the technology skills of both pre-service teachers and in-service teachers. While the above mentioned studies have found that online discussions are a helpful tool during pre-service teachers' preparation for teaching, this current study explores whether the integration of a web-based course management system benefits students in terms of increasing their self-reported computer skills. It also looks at how the use of technology in theory-based educational psychology classes assists in sustaining pre-service teachers' confidence in integrating technology in teaching, and their better understanding of educational principles.

Research Questions

(1) Is there a difference in the course-exit levels of students' self-reported computer skills and confidence in integrating technology into their teaching compared with that of their perception at the beginning of the course?
(2) Do students find that the "hands on" nature of using technology via Blackboard affects their computer skills and confidence in using technology to create technology-based lessons?
(3) What Blackboard activities do students report help build their computer skills, their confidence of technology integration in teaching, and their understanding of educational psychology principles?
(4) How does use of Blackboard help students with their understanding of Educational Psychology principles?

Methodology

Treatment

The courses used in this study integrate technology skills development in the context of a survey course in educational psychology. Since there is not a course designated to systematically introduce technology integration in education for the teacher preparation program, this is a course designed to systematically integrate Educational Psychology theories and technology use in education. An extensive use of Blackboard is adopted with all

students required to engage with various features of the system for discussions of educational psychology topics, to turn in assignments, and to access course materials. Blackboard is a web-based course management system, which offers instructors and students several opportunities that face-to-face class instruction does not. Discussions between instructors and students and among students can be extended outside of classrooms through the Discussion Board. Students can not only discuss educational psychology topics, problem-based teaching cases, and technology assignments in class, but also before and after classes. Students have equal opportunity to participate, especially for those who are shy or less vocal in class. In addition, students have time to reflect on their own ideas and their classmates' postings before they post their thoughts. These opportunities are intended to enhance students' learning (Garrison, 2002; Harasim, 1990). Students have 24/7 access to course notes and resources through online course materials. Instructors can also post assignments to the website instead of delivering them in class so that they have more class time for class activities. The External Links feature of Blackboard provides students more references for unit related materials. In addition, the instructors model for the students how they use the information literacy tools while trying to improve students' literacy skills. On one hand students can observe how instructors utilize multimedia technology in their teaching by using Blackboard. At the same time students themselves have to be able to navigate through the course web site in order to get the needed course material, turn in course assignments, and participate in course discussions. Using technology is part of the course, not just a set of isolated technology assignments. Through maximum exposure to and regular use of basic computer skills, students get more familiar with computer technology, and therefore their anxiety should be reduced (Gunter, 2001). While discussing educational psychology theories through Blackboard, students can integrate these theories into their ideas of how and why they might use technology in their future teaching through various assignments.

Subjects

The subjects were students enrolled in four sections of a 4-credit undergraduate course entitled "Educational Psychology and Instructional Technology." 90% of the students were female students. 87% were 18-22 years old, a traditional group of college students. 84% were juniors. 53% were elementary education majors. Others majors included secondary education, communication disorders, art education, music education, and special education. Most of these students are currently taking methods courses in preparation for student-teaching the following year.

Instruments

Students were given a pre-course and post-course survey measuring their confidence, as well as their proficiency in their ability to use and integrate technology in their teaching. The survey was adapted from Ertmer, Conklin, Lewandowski, Osika, Selo, and Wignall (2003). The pre-survey contains two parts to query both students' perceptions of their computer skills and their confidence of technology integration in teaching, with the post-survey containing a third part asking students' perceptions of whether Blackboard activities help to develop their computer skills and confidence of technology integration in teaching. Furthermore this part of the survey poses the questions as to which Blackboard

activities students consider help them to develop their computer skills, technology integration confidence and knowledge of educational psychology principles.

Changes in students' confidence of technology integration were determined by using repeated-measures ANOVA. To answer question 2 and 3, we conducted a frequency analysis to report the students' perceptions about whether and which Blackboard activities help build their computer skills, their technology integration confidence and understanding of psychology principles.

Interviews with instructors and students were conducted at the end of the semester to triangulate the quantitative data and provided explanations as to how students and professors think about the use of Blackboard in helping students learn.

Preliminary Findings

Separate repeated-measures ANOVAs were conducted with the factor being time - before and after the course and the dependent variable being students' computer skills and confidence scores. The means and standard deviations for computer skills and confidence scores are presented in Tables 1 & 2. The results for the ANOVA indicated a significant difference of students' computer skills, as well as their confidence of technology integration, before and after the course.

Table 1
Computer Skills [Wilks' $\wedge$ = .83, F (1, 36) =7.64, p=.009, partial η^2 =.18]

Survey	M	SD
Pre-course	3.89	1.02
Post-course	4.38	1.06

Table 2
Confidence of Technology Integration [Wilks' $\wedge$ = .60, F (1, 32) =21.18, p=.000, partial η^2 =.40]

Survey	M	SD
Pre-course	4.21	.76
Post-course	4.87	.49

Further examinations on changes of students specific computer skills indicate that students' skills of using word processing, power point, e-mail, listserv, educational software, world wide web/ internet to both locate and present information, and Blackboard are reported significantly different before and after the course. The only insignificant value is the use of

spreadsheets. This is because the course hasn't covered this topic and it was designed this way since the instructors believe that currently there are many ready-to-use software for teachers (e.g., spreadsheet grading software).

Overall students reported that Blackboard helps to develop both their computer skills and their confidence of technology integration in teaching. However, fewer students reported increase of skills and confidence with using spreadsheets, listservs and educational software. Again this may be due to the design of the course, and instructors may not cover the introduction of these parts of technology. Tables 3 and 4 report the percentage of students' perceiving the benefits of using Blackboard in developing their computer skills and confidence of technology integration.

Table 3
Percentage that Students Agree Blackboard Helps to Develop Their Skills of Using Computers

	Word Processing	PowerPoint	E-mail	WWW/Internet	Course Management System
Percentage	92	79	90	90	87

Table 4
Percentage that Students Agree Blackboard Helps to Develop Their Confidence of Integrating Computer Technology in Teaching

	Word Processing	PowerPoint	E-mail	WWW/Internet	Course Management System
Percentage	79	84	76	79	69

All students agreed that Blackboard helped them with their understanding of educational psychology principles: 47% of the students "strongly agreed"; 40% "agreed", and 11% "slightly agreed" (2% missing values).

Further examination of Blackboard components that students reported agreement as having beneficial use included Discussion, Lecture Notes, PowerPoint presentations, technology assignments, case studies, and external web site links. These all had high percentage rates of beneficial use with the lowest having a 53% agreement rate, and the highest having a 92% agreement rate.

Results of the interviews support the quantitative analysis. Generally both teachers and students being interviewed have reported definitely positive effect for use of Blackboard in the course. In all the four classes investigated they use most of the features of the Blackboard system. The most commonly used features are Course Content areas such as Course Documents (for lecture notes, PowerPoint presentations), Assignments (for

technology assignments, case studies), External Links (for more resources or assignments), and other features like Discussion Board, Gradebook, E-mail, and Announcements.

Students reported that they like the feature of Gradebook because they can find out where they are in the class right after the teacher posts the grades, and where they need to improve. However, the examination of the course statistics showed some different results. The most commonly visited area of the course site is Discussion Board which comprise almost half of visits of the course site, ranging from 42% -50% among the four classes examined. Other percentage of the course site visits are 17%-20% for Course Content, 13%-18% for Announcements, 5%-6% for Student Grade, 5% for E-mail. (The total is not 100% since access that is lower than 5% is not reported here.) This findings show that even though students reported that they like Gradebook very much, Discussion Board is actually the area they accessed most.

Interviews with students revealed that the use of Discussion Board helps them understand Educational Psychology principles better because it provides them with more communications among themselves and communications with professors. They have more discussion time because the discussions can be carried over outside of class time. Students reported that they also do follow-up readings and research depending on the topics of the discussions. Students considered that Discussion Board provided them more time to "think about the questions, and structure their thoughts". Shy students became more open and reflective when participating in discussions with the Discussion Board. One of the professors said "I was amazed at those quality postings posted by students who are shy at our class meetings."

Students indicated that with the integration of Blackboard in this Educational Psychology course they observed how their professors use technology in class and how this practice fit with the Educational Psychology principles they were learning. "I like the way my professors used Blackboard. He did not use it just for technology's sake or just posted stuff there. Instead he modeled how to integrate technology in teaching." "Yes, we used Blackboard and we did what is related to what we learned." "It's not like Blackboard stuff has nothing to do with what we learned."

Students considered their current use of Blackboard as effective. However they hope computers do not replace their face-to-face meetings with professors because they do not think that the face-to-face meeting experiences should/can be replaced. Professors realized that the effective use of Discussion Board requires more time from both professors and students. The active role of professors along with interesting discussion topics would generate effective use of Discussion Board and sustain the discussions.

Depending on professors' teaching styles, they used Blackboard slightly differently. First of all, some professors used Discussion Board as a diagnostic and scaffolding tool, others used it for students to relate a personal link with topics covered in face-to-face class meetings. Both students and professors used it as scaffoldings to bring interesting questions to class. "I used Discussion Board as a snap shot, a reminder of where they (students) are, what questions they have". "I asked them to post questions they don't know but they want to know, the most intriguing and puzzling questions". Secondly, some professors required students to participate in online discussions, others didn't. However, even when using the discussion board as a requirement, professors do not count the postings; instead they emphasize the quality of students' postings. Thirdly, some professors used External Links as a repertoire of external resources found on the Internet, while others used it as assigned links

(readings) as well. Professors also liked the feature that they can customize the course site. "I changed the name of the button in order to personalize my course so that it becomes a special place for my students and myself."

Professors reported using Blackboard to model reflective thinking. "Blackboard can be used as a reflection of your course as to what you have been doing and where you are going, or a library for your course." At the same time professors and students reported more time put into the course by using Blackboard, but they all agree that it's worthwhile.

Conclusion

This study details that the exposure of students in web-based course environments, and exchanging ideas electronically, helps to improve their self-reported computer skills and their confidence in using technology and integrating technology in their future teaching. With greater levels of confidence, it is anticipated that pre-service teachers will be more actively engaged in developing the technology skills that the school districts need in which they will teach in the future. This study also documents students' report in the benefits of using Blackboard in their understanding of educational psychology principles. It will serve as a guide on how professors may design web-enhanced courses with a course management system so that students can benefit academically and professors can teach effectively in such an environment. It is suggested that professors should design learner-centered instead of technology-centered courses so that technology is used in an effective and reflective way.

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