Perceptions and Use of Learning Management System Tools and other Technologies in Higher Education: A Preliminary Analysis

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ABSTRACT

This study examines student views and use of technology in conjunction with university coursework. Results reveal that there is widespread use of Microsoft PowerPoint and certain learning management system (LMS) features; however, there are significant differences in views concerning the degree to which these LMS tools enhance learning based on gender. While students view podcasts positively, few download and watch these regularly. Whether frequency of podcast use is due to student inaction or other factors is uncertain, since most students disagree that professors adequately used podcasts.

INTRODUCTION

Today a variety of technology tools are available to help professors enhance teaching techniques. However, faculty adoption and mastery of these tools varies leaving questions about the popularity and reaction among students when the tools are integrated into pedagogy. Although many students find the use of technology in the classroom helpful, others may be frustrated if the technology is used infrequently or improperly. This study seeks to examine student views of emerging and more well established teaching technology tools. In particular, student views on Microsoft PowerPoint, podcasting, and use of a variety of functions/features within a learning management system (LMS) are explored. For this study the most commonly used LMS, Blackboard, is examined.

MICROSOFT POWERPOINT

PowerPoint is a valuable tool for classroom presentations that was introduced in 1987 and became part of the Microsoft Office suite in 1990 (Gaskins 2007). This presentation software has the ability to improve class participation and make time spent studying out of class more valuable. If a professor posts or emails PowerPoint presentations before the class meets, students have the opportunity to

review the slides ahead of time, allowing them to formulate questions pertaining to reading material in advance and come to class already having reviewed the content. PowerPoint can also increase the professor's preparedness and can help instructors stay on topic (Burke & James 2008), as well as create an active learning environment. PowerPoint presentations can also increase the efficiency of lectures by incorporating graphs to convey complex information (Bartsch & Corbern 2003), review questions pertaining to recently covered material, and/or incorporate the use of a Personal Response System (PRS). A PRS uses a hand-held clicker device to allows students to select an answer when a question is presented on the slide (Campbell & Mayer 2009). The system then tallies correct and incorrect answers and reveals the correct answer. Aside from using a PRS in the classroom to provide quick feedback, asking content-based questions helps students stay focused and reinforces new information as questions are answered correctly. Presenting a lecture via PowerPoint also makes it easier for a student to listen to the instruction and take notes at the same time. PowerPoint can be used to keep students focused with bullet points that describe the main ideas of the topics being discussed. This forces students to pay attention, but also provides guidance for the student if they begin to get lost during the discussion. Cornelius and Owen-DeSchryver (2008) recommend the use of PowerPoint presentations with selected words omitted on the slides. Copies of the slides are distributed in class and students must pay attention in order to fill in the missing notes (Giers & Kreiner 2009). Another benefit of using PowerPoint is that it can be uploaded to a LMS site or emailed to students. This may be especially useful for students who need to review difficult concepts, study for a quiz or test, or missed a class. Despite all of the benefits associated with the use of PowerPoint, there are also a number of caveats. While the use of PowerPoint can help improve student learning, the technology can have adverse affects. If the professor is poorly trained on how to use the computer or run a slideshow, it takes time away from teaching and causes frustration for the professor and students. Problems can also if professors read information from the slides, thereby creating a passive learning environment. Clark (2008) found that in the long run, this environment can lead to a decrease in students' class attendance (Strauss, Corrigan & Hofacker 2011). Slides with too many words or complex graphs can create a "sensory overload" for students (Strauss, Corrigan & Hofacker 2011) and slides using small font size can cause student frustration. For many years, one of the main concerns professors had about the use of PowerPoint was that it might take away from the student's creative thinking process. Other concerns include that students will have the impression that the lecture contains important information (i.e., the content on the PowerPoint slide) and unimportant information, the content not presented on the slides (Isseks 2011). Using slides can also encourage students to copy information without critically thinking or listening to the professor.

PODCASTS

While older technologies are still valid in this "new age of learning," the profile of the modern student has changed. Today, students are often balancing social, family, and work obligations while taking university courses. Butler and Pinto-Zipp (2006) find that these circumstances force students to alter their study habits to fit their busy life schedules (Saeed, Yang & Sinnappan 2009). In many cases, this includes incorporating new technologies into their studying and communication channels. Podcasting is a newer technology that is becoming increasingly popular among busy students and professors. Defined as "audio, video, text, and other media files that can be played on the computer or downloaded to MP3 players" (Sprague & Pixley 2008, p. 226), podcasts are also referred to as vodcasts (video podcasts) or enhanced podcasts that include hyperlinks or artwork. Podcasts allow students to view or listen to lecture content at any time or place, but also offer a number of benefits to faculty. Inexpensive software programs such as Windows Media Player allow a professor to record a podcast at little to no cost (Copley 2007). While some podcasts can last for hours, many are only 10-30 minutes in length (Zahay & Fredericks 2010), which may allow busy professors to record these in short timeframes and/or to start and stop recording as time allows. Creating a podcast for students to listen to prior to class can help brief a student on what they are going to learn in class that day (Copley 2007) or ease anxiety a student might feel about going to class (Chan & Lee 2005). Providing a podcast for students to listen to after class can help them review important topics or keep up with material if a class has been missed. Such short-duration podcasts typically do not serve as a substitute for going to class and generally do not discourage attendance (Guertin 2010). While it is helpful to be able to watch or listen to class material on the go, for some students it may not be as useful as reading written material (Chamillard & Karolick 1999) and visual learners may have a difficult time understanding concepts simply by listening to audio-only files (Saeed, Yang & Sinnappan 2009). Others raise concerns that complex math problems or elaborate graphs may be difficult to communicate via this technology (Guertin 2010). Another issue can arise if the podcasts is too long and the student stops listening part-way through the recording. Faculty and student resistance to this technology can be another drawback (McCrea 2010). A professor may refuse to incorporate podcasts into a course if s/he feels they do not have time to record podcasts (Blaisdell 2006) or fears

that the technology may be complicated. There is also the risk that the professor may not like the idea of hearing him/herself recorded (Robson & Greensmith 2008). Students may be resistant when it comes to incorporating podcasts as well. Although this technology is growing in popularity, students who have never listened to a podcast may hesitate when it comes to adding this new technology to their study regimes. Although podcasts are meant to be listened to on the go, this also means the student is multitasking while trying to listen to course information and may not be giving the podcast their full attention. Another possible negative issue is the time it takes to download the podcasts onto a portable device. If a student finds downloading a podcast to be too time consuming, s/he may not download the material at all (Copley 2007).

LEARNING MANAGEMENT SYSTEM (LMS)

The Learning Management System is an online program that serves as a learning and communication platform for students. Blackboard, Canvas, e-College, Moodle, and Sakai are examples of Learning Management Systems. Use of a LMS can help make professors' and students' lives easier by creating an online class setting. One of the best qualities of these systems is its ease of use for students and professors (Green, et al. 2006). Blackboard, currently the leading LMS, provides a platform for students to access course documents and supplemental course material out of class at their convenience (Bouhink & Marcus, 2006; Liaw 2008). This technology also creates a place for students to submit papers online, check grade, and download class documents. Blackboard even provides a feature that can check the paper for evidence of plagiarism (Preidys & Sakalauskas 2010). The Blackboard system presents students with many features beyond providing class notes, including an online chat function. This tool allows students to hold online chats with each other or their professor. The chat function is equipped with a digital whiteboard that allows the professor and students to write notes. At the end of the session, Blackboard gives the user the opportunity to save the chat conversation, as well as the images on the whiteboard (Larkin & Belson 2005). This tool can be helpful for students who may develop questions outside of class, those with learning disabilities, those too shy to ask questions in class, or those enrolled in large classes where time may not allow for all individual questions to be answered. The chat function allows students and professors the opportunity to communicate on a more personal and individual level. In addition to the chat function, Blackboard's technology also allows professors to post quizzes and tests online. After a student takes the quiz or test, the system grades the work and provides the student with immediate results (Liaw 2007).

While providing course documents via Blackboard serves as a way for students to have access to resources, research conducted by Cader and McGovern (2003) concluded that this practice may decrease the student's willingness to come to class (Green et al. 2006). A student may feel their time can be better spent elsewhere if all notes are provided online. Though possible benefits and deterrents to using these technologies have been elaborated, the purpose of this study is to examine current student views and behaviors related to commonly used teaching technology tools. These technologies were selected for the study because they represent a range of technologies used in the modern university classroom from the well established (PowerPoint) to more recent innovations (podcasts). The contribution of the study is a better understanding of student views concerning these technologies and how they are used by faculty and students.

OTHER TECHNOLOGIES–CLASSROOM RESPONSE SYSTEM (CRS), SCREEN CAPTURE SOFTWARE AND APPS FOR I-PADS

There are some newer technologies that are available to students to enhance their education experience. They are shown to have improved student participation in the classroom. According to Fries and Marshall (2006), CRS can have an impact on participation and interest among student thereby creating a positive learning environment. This is only possible as long as the CRM systems are in place. Brandsford et al. (2000) states that the CRS technology allows educators to transform the learning environment for the students. Researcher from different disciplines (Cadwell 2007; Fries & Marrshall 2006; Judson & Sawada 2002; Simpson & Oliver 2007: and Stowell & Nelson 2007) have concluded that CRS technology creates an interactive learning environment for the students. This interaction between the student and the professor contribute to the positive learning/teaching experience.

Limited research has been done on the impact of newer technologies like Screen Capture Software and Apps designed for I-Pads on student learning. As indicated earlier this study focuses on the more established technology tools like PowerPoint, Blackboard and Podcasting

METHOD

A paper-and-pencil survey was distributed to undergraduate and graduate students at a private university in Texas. Students were asked to complete a questionnaire describing their opinions and use of learning technologies such as Microsoft PowerPoint, podcasts, and tools within Blackboard in an academic environment. Questions focused on the use of these technologies in a university environment overall, rather than use of the technology in a particular

course. No incentive was provided for participating in the study.

RESULTS

Characteristics of the respondents are shown in Table 1. Of the 204 respondents, 53% were female. As expected, most students (80%) were in the 18-22 age range; representing a range of student classifications. Almost four out of ten (39%) used a LMS in four or more courses in the semester in which the data was gathered, and accessed the LMS 5 or more days per week (36%). Almost all (97%) reported having access to a MP3 player and many (64%) reported being likely to download and watch a podcast lecture, though only 22% had previously done so.

Table 1
Characteristic of Respondents (n=204)

Characteristic	%
Gender	
Female	53%
Male	47%
Age	
18-22	80%
23-25	12%
26-34	6%
35 & Higher	2%
Classification	
Freshman	20%
Sophomore	14%
Junior	25%
Senior	34%
Graduate	7%
Courses that use a LMS	
0 Courses	3%
1-2 Courses	34%
3 Courses	24%
4 & Above 39%	39%
Number of days per week you access a LMS	
0 days	5%
1-2 days	22%
3-4 days	37%
5 & above	36%
Access to a device that plays MP3s	
Yes	97%
No	3%
Download and watch lectures via Podcast	
Likely	64%
Unlikely	21%
Not sure	15%
Watched/listened to a Podcast provided by an Instructor	
Yes	22%
No	73%
Not sure	5%

Respondents were asked their opinions of the use of podcasts for learning and to rate statements about podcasts on a scale from 1 = strongly disagree to 7 = strongly agree. As shown in Table 2, students generally were positive about the use of podcasts, with the exception of "I would prefer to watch a podcast lecture than attend a lecture in class" which they rated 3.62 out of 7.

Respondents were also asked how much tools used within a LMS enhanced their learning on a scale from 1 = "not at all" to 7 = "very much". As shown in Table 3, students rated the syllabus, assignments, course materials, online tests/quizzes, email, announcements, the calendar, and learning modules highly; whereas chat/who's online and class roster were rated low in terms of enhancing learning. Male and female students' responses to these items were compared using t-test. Perhaps most surprising was the significant differences between the views of men and women, with women rating assignments, online tests/quizzes, e-mail, and learning modules significantly higher on enhancing learning as compared to male students.

Students were also asked how frequently they used each LMS tool on a scale from 1 = "rarely use" to 7 = "frequently use". As shown in Table 4, the tools most frequently used were assignments, e-mail, course materials, the syllabus, announcements, online tests/quizzes, and the calendar. Tools used infrequently were podcasts and chat/who's online.

Table 2
Opinions of Podcasts for Learning

Opinion	Mean
I am better able to effectively listen to the professor's lecture than attend a lecture in class.	4.99
Podcasts would be a very good way to review material in quantitative courses such as statistics or accounting.	4.96
Podcasts would be a very good way to review class material.	4.94
Podcasts would be a very good way to review material in theory-based courses such as management or marketing.	4.92
I do not have time to listen to podcasts in addition to going to class and listening to the professor's lecture.	4.13
I would prefer to watch a podcast lecture than attend a lecture in class.	3.62

Table 3
Perceptions of Learning Management System Tools for Enhancing Learning

How much does each of the following tools in your course/learning management system enhance your learning?*	Male mean	Female mean	p-value
Syllabus	5.77	5.85	.709
Assignments	5.40	5.74	**.039**
Course Materials (PowerPoint or readings)	5.34	5.46	.592
Online tests/quizzes	4.91	5.44	**.027**
E-mail	4.76	5.27	**.020**
Announcements	4.75	5.10	.120
Calendar	4.56	5.02	.114
Learning Modules	4.45	5.04	**.029**
Media Library	4.05	4.17	.685
Threaded Discussion	4.06	4.19	.667
Web Links/ webliography	3.98	4.26	.323
Podcasts	3.94	3.76	.616
Class Groups	3.81	4.38	.056
Class Roster	3.45	3.60	.595
Chat/who's online	3.14	3.43	.316

*Scale of 1-7 with 1 being "not at all" and 7 being "very much"

Table 4
Frequency of Use of Learning Management System Tools

How frequently do you use each course or learning management system tool?*	Mean Score
Assignments	5.98
E-mail	5.67
Course Materials (PowerPoint or readings)	5.63
Syllabus	5.58
Announcements	5.05
Online tests/quizzes	4.97
Calendar	4.33
Learning Modules	3.92
Class Groups	3.79
Threaded Discussion	3.41
Web Links/webliography	3.39
Media Library	3.23
Class Roster	3.03
Podcasts	2.92
Chat/who's online	2.58

*Scale of 1-7 with 1 being "Rarely Use" and 7 being "Frequently Use"

Lastly, students were asked their views of professors and their use of technology. Students rated statements on a scale from 1 = "strongly disagree" to 7 = "strongly agree". As shown in Table 5, students agreed that PowerPoint files should be posted prior to a class lecture (5.63), that professors respond to e-mails in a timely manner (5.13), professors are technology competent (4.60), professors post grades in a timely manner (4.33), and professors adequately use the LMS (4.29); however, they disagreed that professors rely on PowerPoint too much (3.72) and adequately use podcasts (2.17).

Table 5
Professors & Use of Learning Technology

Professor Use	Mean Score
PowerPoint files for a class lecture should be posted prior to that class lecture.	5.63
Professors respond to e-mails in a timely manner.	5.13
Professors are technology competent.	4.60
Professors post grades in a timely manner.	4.33
Professors adequately use the course/learning management system.	4.29
Professors rely on PowerPoint too much	3.72
Professors adequately use podcasts	2.17

*Scale of 1-7 with 1 being "Strongly disagree" and 7 being "Strongly agree"

DISCUSSION

These preliminary results reveal that students hold positive views toward technology tools, use them frequently, and believe that they enhance learning. Females, more than males, seem to believe that some of these technologies such as online tests/quizzes have a positive impact on learning. Future research should explore differences based on other demographic characteristics such as age and ethnicity.

Of the tools explored in the study, podcasting is a newer technology and students appear to be familiar and receptive to its use. Professors are not perceived as adequately using the tool which suggests that training may be needed. This finding may also imply that students may be better able to discern technology competency related to podcasting due to their familiarity with it outside class. . While publishers often provide instructional materials such as PowerPoint slides to accompany a book adoption, or an institution may create a campus-wide template for the LMS, or provide instructional designers to work with faculty in order to effectively set up a course within Blackboard, no such third party currently provides custom podcasts. So, there is perhaps a greater burden on faculty to master podcasting on their own if the technology is used. This may also present a market opportunity for textbook publishers to offer podcasts as perhaps one of the instructional materials that would accompany a textbook adoption.

While this study should be viewed as a preliminary examination of these topics, the findings do reveal significant differences based on gender and suggest that technology tools are widely embraced by students, perceived as useful, and faculty are evaluated on their ability to adequately use them. Future research focused on gender and other group differences is encouraged. Implications of these findings are important as it relates to providing teaching tools that enhance learning for all groups of students.

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