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EXPECTANCY THEORY AS A PREDICTOR OF FACULTY MOTIVATION TO USE A COURSE MANAGEMENT SYSTEM

Marian Turcan
Clemson University, mtscan@rocketmail.com

EXPECTANCY THEORY AS A PREDICTOR OF FACULTY MOTIVATION TO USE A COURSE MANAGEMENT SYSTEM

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Marian Turcan

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Accepted by:

Dr. William Paige, Committee Chair

Dr. Fred Switzer

Dr. Cheryl Poston

Dr. James Rieck

ABSTRACT

The aim of this study was to explore the relationships between the elements of the Expectancy theory and faculty motivation to use a course management system. Specifically it analyzed if the elements of the Expectancy theory (Valence, Instrumentality and Expectancy) were useful in predicting faculty motivation when using Blackboard tools in teaching their courses.

A self-administered survey questionnaire was developed and used as the research instrument for this study. Four hundred and forty eight faculty members were randomly selected from eleven schools from the Atlantic Coast Conference (ACC). Qualitative and quantitative methods were used to analyze the data for the study.

The results of quantitative analysis showed that in a multiple regression between the elements of the VIE theory and faculty motivation to use Blackboard tools, Instrumentality and Valence did not have a significant influence on the model but had a significant relationship with the dependent variable by itself. Expectancy was the only element with a significant influence on the model. Based on the data, the model of the Expectancy theory was not useful in predicting faculty motivation when using Blackboard tools.

Based on the number of answers in the survey, there were more women using Blackboard compared to men and among non-users men accounted for sixty percent of non-users. The relationship between gender and use of Blackboard was not significant to conclude that women were more likely to use Blackboard than men. Faculty perceived

that even if Blackboard requires a lot of time to setup initially, it does save time in the long run when used as a tool to facilitate classroom instruction.

The results of the qualitative analysis in this study found that faculty was more motivated to use those Blackboard tools that facilitated their jobs while teaching. Specifically, those tools that help disseminate course materials, post grades and communicate with students.

The greatest number of users of Blackboard was between twenty eight and forty one years old. From one hundred and one participants, faculty members with eleven to fifteen years of teaching experience were the dominant group of Blackboard users. Among the five departments questioned, there were more users of Blackboard in Sciences and the least in Education. Most of the Blackboard users were on tenure track faculty positions.

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CHAPTER ONE

INTRODUCTION

Research Background

Technology in one form or another has been used in education for a long time. Socrates "complained" that the discovery of the alphabet would create forgetfulness in the learners' souls, because they will not use their memories. Presumably, some feel that technology is interfering with education, while others will adopt the latest available tools to teach their students. The emergence of pencil and paper that replaced the handheld chalkboard had a big impact on how students completed their assignments. The overhead projector challenged instructors in classrooms to do things differently and was looked upon by some as a replacement for the instructor (Schultz, 1965). In the last half of the century alone the emergence of new instructional technologies has outpaced all previous centuries combined (Epper, 1995).

In the last decade, a new technological tool, called e-learning, was introduced and it has changed the role of a traditional instructor. Salmon (2004) refers to instructors as e-moderators because e-learning systems are rapidly transforming these instructors into facilitators, moderators and mentors, besides the traditional role of just a "transmitter of knowledge." Now teachers have the opportunity to become designers of experiences, processes and contexts for learning activity.

In a today's highly mobile society, e-learning is an essential tool that is becoming more popular and more institutions of higher education are adopting these e-learning technologies to cope with the demand of a more flexible education system (Bates, 1999; Souleles, 2005). The availability of high speed internet, not only on computers but also on mobile devices, allows students to access information anytime and anywhere.

In spite of the technological innovations, there are still faculty members who want nothing to do with these new teaching technologies. In a group study, Byron (1995) explained why some faculty are less likely to use these tools and why they objected to the presence of technology in a classroom. Their main concern was that the technology was going to substitute for thinking on part of the student. They also believe that a teacher is present in the classroom to help with the process of learning. These teachers doubt that there is learning going on if studying is done while using a computer and not even seeing a professor (Byron, 1995). Research by Surry (2000) found that in the instructional process, faculty's use of technology for teaching purposes is low. In other words, teachers are either not making enough use of the instructional technology or are not using the technology to its full potential. Surry (2000) noted that even though new technologies are being adopted by educational institutions, most of them are used for administrative purposes or data management. The rate of integration of these technologies into classrooms is still low (Surry, 2000).

It is complicated to understand why professors are not using these technologies at their full potential. Could it be because of limited availability or unfamiliarity with these new tools? Or are they present and available, but the professors' lack the motivation to

use them? There are several potential reasons for the failure of faculty to employ technology in classrooms. One, as mentioned above, is technology being seen as impedance in the classroom (Byron, 1995). Other reasons for not using technology include the lack of time, training, rewards, awareness, and understanding how the new technology can be effectively implemented (Byron, 1995; Stephens, 1992,; Todd, 1993; Topp, Mortenson & Grandgenett, 1995).

No matter the reason, educational institutions in the face of instructors have not fully realized the use of technology in their classrooms. There is an increased demand from the student population who want to see professors apply these e-leaning tools in their process of learning.

Statement of the problem

It is important that institutions of higher education get the most from the e-learning technology they purchase. A smart use of e-learning tools could benefit students as they obtain the necessary information for functioning in today's academic setting and making sure that the institutions are investing wisely into e-learning systems that are to be used. One way to ensure that both of these goals are met is to have faculty members introduce new e-learning technologies to students. The need for incorporation of web based technology into instructional curriculum has been widely investigated (Chou, 2004; Ertmer, Addison, Lane, Ross, & Woods, 1999; Groves & Zemel, 2000). Unfortunately, some faculty members are less willing to integrate technology into their classroom learning experiences or think it would not be useful (Lee, 2001; Maguire, 2005; Rakes &

Casey, 2002). Research at Carnegie Mellon University indicated that arts instructors were not likely to use technology in their instruction, preferring to stick to their tried and true methods. However, the first disciplines to use Web based technology were humanities, social sciences, and engineering disciplines, similar to those in theatre (Gerlich & Perrier, 2003).

Educational institutions that implement these e-learning systems need to find ways to motivate professors to use them more often. Motivation is a complex process and is typically linked to two dimensions: external and external. External motivation includes factors that are beyond control of the individual faculty member. Internal motivation is related to personal reasons and beliefs. Ferguson (2000) defines motivation as an internal process that pushes or pulls the individual, and the push or pull relates to some external event. Motivation is the determinants of individual's thought and action: why individual's behavior is initiated, persists, and stops, as well as what choices are made by the individual (Weiner, 1992). Motivation can also affect an individual's perception, learning, and attitudes (Ferguson, 2000, Loudon & Bitta, 1993, Kotler, 1984).

As faculty members represent the important mediator in the process of education, understanding what motivates them to use an instructional medium could be beneficial for companies that design the course management systems as well as for the administration of educational institutions. Ultimate decisions to invest large amounts of financial resources and time should come from the demand of professors wanting to use these e-learning tools.

Significance of the study

Current research in e-learning is focusing around several aspects. Specifically, researchers are interested to see the use of e-learning on mobile devices; use of open source course management systems like Moodle, Sakai, etc, and their compatibility and integration with other software (Nagel, 2010). Also, current research focuses on explorations on new instructional models, discussion of effective assessment, explorations of the technical, managerial and structural requirements for e-learning, discussion of staff development, the protocols and standards for transferability of materials in e-learning environment, as well as issues related to accessibility, copyright and plagiarism (Conole, Oliver & Isroff, 2004; Souleles, 2005). Tony Bates Associates Inc (2006) in a literature review from 2003-2005 included over 2000 reviewed papers in English/Spanish/French and it revealed that e-learning research focused about 10% on policies and strategies, 30% on teaching and learning and about 60% on the use of technology.

Very little research has been done on faculty motivation associated with use of course management systems. In a study by Baker-Eveleth and Stone (2008), Expectancy theory was used to assess behavioral intentions to use computer applications. Their study focused on behavioral intentions to use Digital Measures that is affected by the ease of system use that impacted self-efficacy and outcome expectancy.

This study was designed to investigate several aspects of a specific e-learning technology. It looked at faculty motivation associated with the use of course management

systems also called learning management systems and evaluated the level of utilization of a course management system, specifically Blackboard. The researcher selected Vroom's Expectancy theory, also called VIE theory (1964), to explain how the process of motivation affects the use of Blackboard tools. The last part of this research looked at how faculty members perceive Blackboard and if it is viewed as a time saving tool in their daily teaching activities. A successful application of the Expectancy theory may provide a better understanding of faculty motivation to use of e-learning in classrooms.

Research Objectives

The objectives of this research were to:

1) Investigate the current level of utilization of Blackboard in the institutions of higher education selected for this study.
2) Apply Vroom's Expectancy theory (VIE) to explain faculty motivation to use nine Blackboard tools.
3) Examine the relationships between the elements of the VIE theory and the Motivation to use Blackboard tools.
4) Evaluate if using Blackboard is related to saving time during for the instructional process.

Research Questions

1. Does the VIE model predict faculty motivation to use Blackboard?
2. What is the strongest motivational factor that drives faculty to use course management tools in facilitating classroom teaching?

3. Is there a relationship between Valence and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?
4. Is there a relationship between Instrumentality and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?
5. Is there a relationship between Expectancy and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?
6. Does a faculty member perceive using Blackboard course management tools as saving time?
7. Is there a relationship between utilization of course management tools and gender?

Research Design and Hypotheses

The research design used in this study was a combination of quantitative and qualitative methods. The fusion of quantitative research design and qualitative research design allowed the researcher to explore and examine several different relationships. The qualitative methods were used to collect responses from participants with the help of the survey instrument of this study. The relationships between variables were analyzed using quantitative methods. Multiple regressions, correlation coefficients, analysis of variance (ANOVA), t-test and Chi-square were used to analyze the results.

The statistical analysis of this study was based on the following hypotheses:

Hypothesis 1: There is a relationship between a faculty member's motivation to use Blackboard and the Elements of VIE theory.

Hypothesis 2: Valence is useful in predicting a faculty member's motivation to use Blackboard.

Hypothesis 3: Instrumentality is useful in predicting a faculty member's motivation to use Blackboard.

Hypothesis 4: Expectancy is useful in predicting a faculty member's motivation to use Blackboard.

Hypothesis 5: A faculty member perceives using Blackboard course management tools as saving time.

Hypothesis 6: There is a relationship between utilization of course management tools and gender.

Limitations of Study

The following limitations were inherent to this study due to the availability of funds, respondents and research resources.

1) The population of this study was limited to the Atlantic Coast Conference universities, consisting of 12 schools most of them on the East coast of the United States.
2) Other Course Management Systems besides Blackboard were not analyzed or included in this study.
3) The sampling of participants at each university was done mostly from 5 colleges: Business, Sciences (Engineering), Education, Arts, Health and Medicine.

4) The survey instrument designed for this study was not collecting information opinions, attitudes or experiences with Blackboard or any other course management systems.

Definition of terms

Throughout this dissertation specific terms were used. In order to better understand their meaning in the context of this study the following definitions define the terms.

Technology: in this study technology refers to using web based applications on computers during the instructional process.

Expectancy theory: the theory of motivation developed by Vroom (1964). It explains the process of individual decision making based on various behavioral alternatives.

Its theoretical formula: Motivation Force= Valence x Instrumentality x Expectancy.

Faculty motivation: the process or act that stimulates a faculty member to work.

Expectancy: represents the perceived probability that effort will lead to good performance. Variables that could affect expectancy include: self-efficacy, goal difficulty and perceived control.

Instrumentality: the perceived probability that performance will lead to desired outcomes. Some of the factors affecting instrumentality are: trust, control and policies.

Valence: the value an individual places on rewards. It is affected by needs, goals, values and preferences.

Extrinsic motivator: rewards which are doled out by supervisors to ensure that work is done properly and that the rules are followed. They include things like salaries, bonuses, commissions, perks, benefits, and cash rewards (Thomas, 2002).

Intrinsic motivator: Rewards that come to faculty members directly from the work that they do-satisfaction such as pride of teaching or the sense that they are helping a student (Thomas, 2002).

Web based tools: provide reporting and data transmission capabilities through the use of standard Internet technology. Helps visualize and disseminate instructional materials to students.

E- learning- is defined as instruction delivered on a computer via internet or CD-ROM (Clark & Mayer, 2007).

Course Management System/Learning Management System - an online proprietary virtual learning environment system that is sold to colleges and other institutions and used on many campuses for e-learning. Instructors can add to their courses tools such as discussion boards, mail systems and live chat, along with content including documents and web pages.

Organization of the Study

Chapter two provides a comprehensive literature review of the use of technology in education, the process of e-learning and a couple of theories that explain the process of human motivation.

Chapter three represents the methodology and the procedures used in this research. It starts with the description of the research objectives, questions and hypotheses. Also it provides information about the process of development of the self-administered survey. The section continues with a pilot study conducted to test the validity and reliability of the research instrument. It explains the data sampling procedure, the process of data encoding and collection and the statistical methods used to analyze the raw data of this study.

Chapter four presents the findings from the survey respondents and a statistical analysis for each hypothesis and research question that was tested.

Chapter five describes the conclusions drawn as a result of the data analysis. Recommendations for further research and conclusions are provided.

CHAPTER TWO

REVIEW OF LITERATURE

History of technology in education

In a literature review done by Merritt R. Jr. (1998) about technology used in classrooms, there is a good overview of how this technology has evolved over the years. Merritt mentioned that in 1933, Arnsparger completed his Teachers college doctoral dissertation on how the "new" sound pictures could be used in the classroom. In his work, Arnsparger noted that there were few studies that had been done to determine "the effectiveness of sound pictures as teaching aids" and since there was a lack of studies to the newness of the sound picture, several studies pointed to some interesting findings. A 1931 study New York University found that sound pictures "are as effective as identical lecture demonstrations in conveying specific information to mature students". However, it is interesting to point out that when films which emulated a lecture were compared to silent films, which had the exact same visual content, the silent films were considered to be more effective " in conveying specific information" (Arnsparger 1933, p.5-6).

A second study cited by Arnsparger from the Teachers College found in all situations that those who saw the talking picture scored better on subsequent tests. Various scenarios were tested including having learners see the picture and not read the monograph. Sixty percent of those who saw the picture and did not read the monograph "made a score higher than the average of those spent on the average 2.61 hours reading the monograph" (p.8). This could be the first case of "why read the book, when one can

wait for the movie". In Arnsparger's 1933 study, he found that in elementary classes across the country, children in experimental groups consistently scored better than those in the control groups. Experimental groups were ones that used the "new" technology of educational sound pictures. He noted that his work, done specifically in natural science and music, is somewhat narrow but nonetheless "suggest many other possibilities for fruitful research, the results of which should be of greatest importance to the whole field of education (p.89). Time showed that Asnsparger was correct in his assumption that the sound picture would be of great importance to education, as most people experienced the use of movies at all levels of education. That tradition continues today, although the film projector has been replaced by the much quieter video cassette, and later by a DVD player or digital files on the computer.

A technology that did not fare as well as the sound picture was in the radio. As Stubblefield and Keane (1994) report, radio had some informal use as a learning tool. News programs and opportunities to hear political leaders provided an informal educational tool for Americans in the 1930s. However, and unexpected educational experience was obtained through soap operas which "served an education function for housewives by helping them realize that others shared their problems, by showing how others responded to and resolved conflict, and by reinforcing their values. In the late 1920s, "sixty-five colleges and universities were using radio" to reach students. But during the Great Depression, it was difficult to purchase time on commercial stations and the cost of operating radio stations was too high for most institutions. Therefore, the great promise of radio as an educational medium was dashed by the 1940s. The option was to

turn to correspondence type activities, a method of distance learning that continues to be used in conjunction with other media.

Television followed radio onto the educational scene. The discussions that took place at the Wayne-RCA invitational Conference on Televised Instruction in 1961, it was noted that televised instruction was beginning to take hold (Dreyfus, 1962). Also at that conference, Samuel Brownell pointed out that televised teaching was reliable and could effectively save time by having a single individual teach a lesson and deliver that lesson to several classrooms. This particular position brought out a question concerning the job security of teachers with the onset of technology.

Another point brought out in the 1961 conference was departmental recognition. This may be one of the first discussions about the subject of support for instructors using technology. Secrist and Herrman (1961) reported that they did have support of their departments. Another consideration is the effectiveness of television in the classroom. Both Holmes (1962) and Weld (1962) noted that the technology (in this case television) was not going to solve inherent problems with individual instructor's teaching. Thus, the concept that technology could affect what is learned by students is not a new idea. Holmes suggested at the 1961 conference on television that a title of similar conference on education technology held 2000 years ago "might have been the use of Papyrus as in Instructional medium, or 400 years ago-Print as an instructional Medium".

Computers are now the new technology being considered for classroom use. Many of the technologies available to the instructor are computer driven. Such as

computer graphics, use of CDs, computer screen projection and even work processing. The computer has found its application in higher education since its emergence on the scene just over 50 years ago. The initial all-electronic computer was called ENIAC. According to Dawson (1997), the machine could go for about five days before repair was needed and its computing ability compared to what one can obtain with a hand held calculator. The use of computers has increased immensely since ENIAC came on the scene at the University of Pennsylvania in 1947. One indication of the expansion of computers in higher education is the use of electronic mail. Dawson points out that in 1996 "The U.S. Postal Service delivered a record 180 billion pieces of mail…however, there were over 1 trillion e-mail messages sent." (p.1). Today, computer ownership is something that is taken for granted. In 1972 only 150,000 computers existed in the world. Within two years a single company, Apple computer Inc., was be responsible for shipping 100 million computers.

It is most likely that a majority of those computers will be used to explore the Internet. The Internet is a system of computers linked together and is accessible using a modem or network connection. On the Internet are pages which can be accessed using a Uniform Resource Locator (URL). The content of those pages can satisfy any human interest. Individuals can find information on nearly any topic that interests them. It seems that the Internet is relative newcomer to the computer, but it has actually been around since the 1960s. During that decade, the federal government funded a project called ARAPNET (Gates, Myhvold, & Rinearson, 1995). ARAPNET was the predecessor of the Internet, much like two lane highways that spanned the United Stated were the

predecessors of interstate highways. Also available in the late 1980s was BITNET which stood for "Because it's Time network". (http://www.netlingo.com/more/bitnet.html, 1998). BITNET was changed to CREN (Corporation for Research and Educational Networking) in 1987. In 1989, funding for ARAPNET was cut off and the Internet was set up in its place. University professors from science and engineering fields were the initial users of the Internet.

Now, a couple of decades later, the Internet has grown into a matured business and educational tool. The success of the Internet has led many institutions to use this resource for distance learning. Other institutions have come into existence because of the technology. The issue of instructional technology has a long-standing history and can be traced back to any new medium that comes along. Currently, the technology is focused on distance learning as well as the use of the computer learning tools in the classroom.

E-learning

According for Valentine (2002), distance learning started very early in Europe in the form of correspondence courses. Initially it was what the name implies, correspondence. Students would get their assignments and mail them when they were complete. With technological advances, this practice evolved when instructional radio and television become popular, roughly in the middle of the twentieth century.

Over the years, distance learning kept changing and adding new methods of instructional delivery. The conventional methods are still around, some of them being modified to accommodate the new technological advances. For example, tape lectures

have evolved into streaming video and podcasts, the new digital formats intended for digital audio/video players.

The most radical changes in distance education in the last decades were due to appearance of the Internet. New formats and compression of video/audio signals allowed for real-time delivery of distance education. The instant desire for learning was there to gratify those hungry for knowledge.

O'Mahony (2003) mentioned that several factors contributed and assisted to the convergence of this new form of distance education. Increasingly sophisticated web browsers; increasingly sophisticated web scripting languages; increasing bandwidth, improved data compression techniques; increased access to powerful personal computing devices; and increased levels of user knowledge and understanding are some of these factors. (p. 685).

So what does e-leaning, really mean? There is some overlap between computer-assisted learning and e-leaning, but e-leaning is often associated with instruction conducted online or using web-based tools. There are multiple definitions for e-leaning in the literature. O'Mahony (2003) mentioned that e-learning differs from regular computer assisted learning by the use of web-enables technologies. Morrison and Khan (2003), which states that e-learning is "an innovative approach for delivering electronically mediated, well-designed, learner-centered and interactive learning environments to anyone, anyplace, anytime by utilizing the internet and digital technologies in concert with instructional design principles" Valentine (2002), on the other hand, provided a few definitions for distance learning, which in essence, point to the primary distinction of

distance learning, namely the separation between the instructor and students by space, but not necessarily by time. And the most obvious example of this would be the use of compressed video which can be delivered in real time.

Chang (2008) in his literature review of e-learning stated that in the evolution of e-learning components that are used today, one will find that it has really only been about a decade since the emergence of many components that support the current e-learning system. In 1990s, Tim Berners-Lee proposed his idea for a World Wide Web. During the fall of 1994, the early version of Netscape launched. In late 1995, both Windows 95 and the first Internet Explorer were launched. And in 1996, both the early version of WebCT and Blackboard were released.

E-learning evolution

Computer assisted training or teaching has not been around for such a long time. Before the appearance of e-learning, the only possible way to get knowledge from a qualified instructor was in a regular classroom. The evolution of computer technologies and well as the lower costs associated with using and developing instructional materials allowed for delivery of instructional materials via computers.

In the early 1990s, the most popular medium used for instruction were videotapes. It represented a very small market and lacked the 'scalability' that is so important in today's applications (Cooke, 2004). It was a good idea to use video tapes, although it had some problems: a) it was hard to customize according to the needs of the users; b) expensive to maintain and c) it was difficult to upgrade. Users had to find the necessary

equipment to watch the video tapes and there was practically no interaction that would evaluate the progress and assess the knowledge acquired.

Clearly, the method of video tapes was not the best solution for instruction. As a result of appearance of Windows, Macintosh, CD-ROMs and PowerPoint, Computer based training emerged. Kiffmeyer (2004) notes that history of e-learning could be divided into several chapters:

- Instructor-Led Training Era (Pre 1983)

  before computers were widely available, instructor - led training (ILT was the primary training method.
- Multimedia Era - (1984 to 1993)

  Windows 3.1, Macintosh, CD-ROMs, PowerPoint marked the technological advancement of the Multimedia Era. In an attempt to make training more transportable and visually engaging, CT courses were delivered via CD-ROM.
- Web Infancy - (1994 - 1999)

  As the Web evolved, training providers began exploring how this new technology could improve training. The advent of email, Web browsers, HTML, media players, low fidelity streamed audio/video and simple Java began to change the face of multimedia training.
- Next Generation Web - (2000 - 2005)

  Technological advance including Java/IP network applications, rich streaming media, high-bandwidth access, and advance Web site design - are

> revolutionizing the training industry. Today, live instructor led training (ILT) via the Web can be combined with real-time mentoring, improved learner services, and up-to-date, engaging "born on the web" content to create a highly-effective, multi-dimensional learning environment. Mobile devices allow the user to access just-in-time learning using their mobile devices. It has been estimated that there will be more mobile devises in the year 2005 than there will be integrated desktops. These sophisticated training solutions provide even greater cost savings, higher quality learning experiences and are setting the standards for the educational standards of the future.

Even though initially CR-ROMs were viewed as the solution for delivering instruction using computers, it still lacked the ability to track user's performance in a central database and also was not easily upgradeable. Internet was viewed as the perfect solutions, however there was a problem, when the content was places on the web, it was simply text with very little graphics. No one really cared about the effectiveness of this new medium – it was just really cool. (Cooke, 2004)

Clark (2002) mentioned that instructors and users began to realize that just posting information on the web without a learning strategy was pointless. He mentioned that in order to improve learning, this method of instruction must fit into students' lives and not the other way around. As a result, e-learning was born.

Learning Management System or LMS was the first innovation in e-learning. The first Learning Management Systems (LMS) offered off-the-shelf platforms for front-end

registration and course cataloging, and they tracked skills management and reporting on the back-end (Clark, 2002). This allowed schools and companies to place courses online and be able to track students' progress, communicate with students effectively and provide a place for real-time discussions.

The next step in the evolution process was e-Classroom. It was a web-based application with synchronization of events and integration of computer-based training and simulations (Clark, 2002). Centra is one of the application that is used often today.

e-Classrooms are often called Live Instructor-Lead Training or ILT. Live instructor-led training (ILT) via the Web can be combined with real-time mentoring, improved learner services, and up-to-date, engaging "born on the Web" content to create a highly-effective, multi-dimensional learning environment (Kiffmeyer, 2004).

Modern trends and evolving technologies continue to improve and amaze with possibilities that instructional methods hold. As long as training is continually geared towards the learners and strategies are used in the training e-learning programs will continue to serve their purpose.

Advantages and disadvantages of e-learning

E-learning has several advantages over traditional methods of instruction. Cantoni, Cellario, and Porta (2003) point out that e-learning is usually less expensive to deliver. E-learning is more cost effective than traditional learning because less time and money is spent traveling. Since e-learning can be done in any geographic location and

there are virtually no travel expenses, this type of learning is much less costly than doing learning at a traditional institution. It will not be restricted by physical location; this could allow saving money on renting rooms for instruction in several locations and times of instruction.

Flexibility is another major benefit of e-learning. E-learning has the advantage of student being able to take a class anytime anywhere. Education is available when and where it is needed. E-learning can be done at the office, at home, on the road, 24 hours a day, and seven days a week. E-learning also has measurable assessments which can be created so the both the instructors and students will know what the students have learned, when they've completed courses, and how they have performed (Chang, 2008).

Student like e-learning because it accommodates different types of learning styles and allows them to learn at own pace. Various activities could be utilized that apply to many different learning styles learners have. Learners can fit e-learning into their busy schedule. If they hold a job, they can still be working with e-learning. If the learner needs to do the learning at night, then this option is available. Learners can sit in their home get comfortable and do the learning if they desire. It also could benefit instructors who have to manage large groups of students in their distance education courses. Large groups of people are not a problem anymore. E-learning could handle a large number of students in several locations simultaneously (Chang, 2008).

To make learning more enjoyable and effective, e-learning content subject are often presented using a combination of visual and audio elements to improve learner's

retention. The interaction and communication between learners and instructors are often encouraged through the use of chat room, discussion boards, instant messaging and email. E-learning also makes it possible for learners to customize learning materials to their own needs, leading to more effective learning and hence a faster learning curve when compared to instructor-led training. The benefit of e-learning environment being a virtual world provides learners the courage and opportunity to explore new materials without having to worry about being identified or making upfront exposure (Cantoni, Cellario and Porta, 2003).

There are several disadvantages of e-learning. First of all, institutions that promote e-learning need to purchase new technologies required operating these instructional programs which could be expensive. Having those new technologies without the knowledge of how to operate it is purposeless. Thus, it is necessary to hire or train staff members who are going to operate and develop these systems. There could be frustration among users if new technologies cause problems. (Chang, 2008)

A reliable computer and a fast Internet is essential for users of these e-learning systems. Otherwise, it is necessary to spend additional time to train the users how to use a computer. A slow internet connection would require longer times to download the rich multimedia contents (Cantoni, Cellario and Porta, 2003).

Not to disregard that e-learning activities could be time consuming just as much time for attending class and completing assignments as any traditional classroom course. This means that students have to be highly motivated and responsible because all the

work they do is on their own. Learners with low motivation or bad study habits may fall behind (Salmon, 2004).

The fact that the instructor is not physically present or unavailable during the instruction required the learners to have a discipline to work independently without the instructor's assistance. E-learners also need to have good writing and communication skills. This will help them express their ideas and when instructors and other learners aren't meeting face-to-face it is possible to misinterpret what was meant (Cantoni, Cellario and Porta, 2003).

E-Learning Environments

According to data from the National Education Technology Plan (2004) by the US Department of Education, at least 15 states provide some form of virtual schooling to supplement regular classes or provide for special needs. Hundreds of thousands of students are taking advantage of e-learning 2010 school year. About 25 percent of all K-12 public schools now offer some form of e-learning or virtual school instruction. The federal government predicts that in the next decade a majority of schools will be on board and offering distance-learning classes to students.

E-learning environments used today in major universities could be classified into two categories: commercial Learning Management Systems such as Blackboard and the open source systems such as LAMS, SAKAI and Moodle. Weller (2006) points out that "The commercial Learning Management Systems (LSM) set the foundation for the current open source LMS that are available." The drawbacks of the commercial LMS, when coupled with some aspects of the conceptual framework of certain open source

LMS, set a good foundation for the development of a future LMS. Weller calls Learning Management Systems (LMS) as Virtual Learning Environment (VLE) and mentioned that some characteristics of the commercial VLE (or LMS) are the following:

1. Content focused.
2. No strong pedagogy.
3. Based around a teacher-classroom model.
4. Combine a number of average tools, but not the best ones.
5. Do not feature a particular tool.
6. Operate on a lowest common denominator approach.
7. Do not meet the needs of different subject areas.
8. It is difficult to exchange content between them, despite claims to interoperability.

Weller (2006) mentioned that although these characteristics helped VLEs become popular, they are also seen as drawbacks because these characteristics did not help e-learning to be integrated aggressively into the educational process. These tools and features that are present in VLEs are very suitable for integration with current educational practices and do not require big changes to the current teaching style and educational practices.

Commercial VLEs or LMSs gained ground and trust from users and as a result became popular. These systems and their innovations attracted conventional users and enthusiasts. For some, commercial VLEs were not satisfying, so the enthusiast began looking for something more, specifically for solutions to address the pedagogical needs

of e-learners. As a result, the open source LMS came into play, such as LAMS and Moodle, as well as closely integrated systems such as portals and e-portfolios (Weller, 2006 p. 100).

E-learning Trends

In a paper published by the *Department of Mathematics and Computer Science Technical University by* Carabaneanu, Trandafir and Mierlus-Mazilu (2006), the authors analyzed what trends are in e-learning. The paper specifies the following trends:

1. Mobile technologies

Future predictions indicate that learning solutions will be integrated into mobile technologies as mobile phones, PDAs, digital pen and paper and other devices that are to appear in the future. In the near future there is even a possibility of learning solutions to be integrated into electronic appliances and information interfaces.

There are new potential markets that could evolve using e-learning on mobile devices, specifically we are talking about:

a. The market of learning services for people that do not have access to well built infrastructure like internet and learners in developing countries.
b. The second market is for people who are merely on the move because of their jobs, students that need individualized learning.

In the United States, PDAs have been used in schools and for workers on the move and has significant results in terms of improved learning effectiveness. In Europe, mobile learning is beginning to develop, and telecommunications companies such as

Nokia and Vodafone have already integrated these technologies into their training and development systems.

However, the real growth across this sector remains to be seen. Any growth in this market is likely to happen in the medium to long term future.

2. Simulations in e-learning process

Simulated programs have played an important role in the learning process of aviation, aeronautical industry and the department of defense. Due to high costs and lack of technological tools needed to develop such applications, simulation programs have not been popular on a large scale. These days we are in a different situation and simulations are being adopted in other industries and for a broad range of skills and competence development. Technology and cost barriers are continuing to shrink, opening up the potential for wider adoption of simulation technology. One of the most popular applications today, Abode Flash, has become the core of e-leaning simulation-development and vendors are offering more industry- and topic-specific simulation templates.

Computed mediated simulations are expected to gain a larger share of education and training activities. Simulations may offer advantages over handbooks and they can complement lectures, demonstrations and real world practice opportunities.
The market for these kinds of learning services will probably continue to grow as simulation technologies become more sophisticated and more cost effective to build.

3. Adaptive learning environments (ALEs)

Developers and users of e-learning are becoming more aware about the potential benefits of an adaptive environment.

Individualized learning or learning adapted to specific needs of an individual is hard to achieve especially on a large scale using traditional approaches. A more diverse population is participating in learning activities, and every individual has his/her own way of accessing the media used to collaborate and manipulate that educational content for their own needs.

A learning environment is considered adaptive if it is capable of: monitoring the activities of its users; interpreting results on the basis of domain-specific models; inferring user requirements and preferences out of the interpreted activities, appropriately representing these in associated models; and, finally, acting upon the available knowledge on its users and the subject matter at hand, to dynamically facilitate the learning process.

Adaptive behavior on the part of a learning environment can have several manifestations:

• *Adaptive Interaction* refers to adaptations in the system's interface and are intended to facilitate or support the user's interaction with the system, without, modifying in any way the learning "content" itself. Examples of adaptations at this level include: the employment of alternative graphical or color schemes, font sizes, etc., to accommodate user preferences, requirements or disabilities at the lexical (or physical) level of interaction; the reorganization or restructuring of interactive tasks at the syntactic

level of interaction; or the adoption of alternative interaction metaphors at the semantic level of interaction.

• *Adaptive Course Delivery* constitutes the most common and widely used collection of adaptation techniques applied in learning environments today. In particular, the term is used to refer to adaptations that are intended to tailor a course (or, in some cases, a series of courses) to the individual learner. The intention is to optimize the "fit" between course contents and user characteristics / requirements, so that the "optimal" learning result is obtained, while, in concept, the time and interactions expended on a course are brought to a "minimum".

• *Content Discovery and Assembly* refers to the application of adaptive techniques in the discovery and assembly of learning material / "content" from potentially distributed sources/ repositories. The adaptive component of this process lies with the utilization of adaptation- oriented models and knowledge about users typically derived from monitoring, both of which are not available to non-adaptive systems that engage in the same process.

• *Adaptive Collaboration Support* is intended to capture adaptive support in learning processes that involve communication between multiple persons (and, therefore, social interaction), and potentially, collaboration towards common objectives. This is an important dimension to be considered as we are moving away from "isolationist" approaches of e-learning, which are at odds with what modern learning theory increasingly emphasizes: the importance of collaboration, cooperative learning, communities of learners, social negotiation, and apprenticeship in learning.

One of the problems regarding the adaptive learning environments now is that existing standards do have some provisions for adaptation, but require substantial extensions to accommodate common practice in adaptive learning environments (ALEs). The motivation for seeking standardization in adaptive e-Learning is directly linked to cost factors related to the development of ALEs and adaptive courses.

4. Blended learning

Another trend involves blended learning programs. The term "blended learning" has come to describe a well thought-out combination of e-learning and other traditional training methods. The combination is meant to increase effectiveness in the process of learning, due to the fact that a single delivery method is no longer sufficient to handle all training needs. Blended learning has the advantage that preserves the necessary consideration of how people learn, but at the same time offers options for learning and produce measurable savings in learning offerings promised by e-learning.

5. Virtual environments and learning games**.**

Cantoni, Cellario and Porta (2003) emphasized the visual component of the e-learning experience as a significant feature for effective content development and delivery. It is projected that the adoption of new interaction paradigms based on multi-dimensional metaphors and perceptive interfaces as necessary direction to take in order to achieve a more natural and effective e-learning experiences (p. 333).

The benefits of such multi-dimensional interfaces can be understood through the effect of 3D virtual artifacts. A 3D virtual artifact is able to provide *real* communication and interaction among people beyond the physical-geographical limitations and constraints.

An active engagement with *real* artifacts improves student memory-learning mental models (Cantoni, Cellario, & Porta, 2003): "student may actively explore existing pre-built worlds (discovery learning) and build related internal models (constructivism), or actively create-modify worlds, to fully integrate their own models of the world (constructionism), while eventually sharing their evolving knowledge representations in a virtual collaborative environment" (p. 342).

Connolly and Stansfield (2006) described the development of e-learning and game-based e-learning applications as applied to students and highlight that such technologies can contribute to help overcome the difficulties in teaching Information Systems (IS). The games could have the following advantages:

• provide a challenging and complex real-world environment within which to apply their theoretical knowledge;

• overcome difficulties in dealing with ambiguity and vagueness;

• develop and apply transferable analytical and problem-solving skills;

• develop self confidence and increased motivation;

• allow students time to reflect upon their practice and develop meta-cognitive strategies capable of adapting to new and evolving situations.

Unfortunately, with financial constraints that educational institutions have, these applications are still far beyond the possibilities of many.

Course Management Systems

In Dixon's (2008) literature review about faculty use of courseware to teach counseling theories she mentioned that over the past decade, higher education has

invested heavily in course management systems (CMS) which serve as the teaching environment for online distance education (Morgan and Schlais, 2005). This is very beneficial for students who could use this system anytime to access available course materials. This virtual environment has a determined functionality predetermined by software and the look and interface is determined by programming. One of the advantages of this system is that it allows the participation of students who are busy with their jobs or families, live far away from the location of university's campus, or just prefer to learn from home.

Faculty members are often encouraged to teach online courses or to blend online instruction with face-to-face classroom instruction. From a university administrator's perspective, a real advantage of online instruction is the ability to enroll more students without having to build more classrooms (Bonk and Dennen, 2003).

Online Courses

Faculty became engaged with the idea of using these Course Management Systems when the increased demand for online learning coincided with wide adoption of these course management systems by universities, making web-based teaching easier than before (Bonk, 2006). Problems still persisted and instructors have become aware of the multiple levels of complexity in learning environments as they attempt to translate an existing course into a web based version (Sawyer, 2000). The translation of existing materials into a medium of online courses is not always adequate. Teaching strategies are different from those of the traditional classroom. Text-based asynchronous

communication in online courses has largely replaced lectures, discussions, and printed hand-outs. In a recent survey of factors important to successful online teaching, instructors' need for an online pedagogy ranked significantly higher than their need for technical expertise (Bonk & Kim, 2006).

Malikowski et al (2007) developed a model for research on course management systems based on five categories: (a) transmitting course content; (b) evaluating students; (c) evaluating courses and instructors; (d) creating class discussions; and (e) creating computer-based instruction. The study found that the instructors most frequently used the CMS for transmitting course content such as the syllabus, readings, and assignments. A second most used form of transmitted content was announcements created within the CMS, followed by the built-in grade book. Two of the categories moderately used were evaluating students through online quizzes and creating class interactions through discussion boards. The CMS was rarely used to evaluate course and instructors or for computer based instruction.

In a study that examined faculty adoption and implementation of features from Blackboard, West, Waddoups and Graham (2007) found that instructors rarely adopted all of the features of a course management system. Faculty chose a feature at a time and re-evaluated the use of other features. Overtime, they experienced technical or pedagogical challenges. Some grew more comfortable with the tool and tried adapting it to support different pedagogies. Depending on how successful the instructor was in overcoming implementation challenges, the instructor chose one of three paths:

1. To continue to use the tool or some of its features,
2. To scale down their use of the tool or reduce the number of features used, or
3. Discard the tool completely in favor of other options.

Ely (1999) found eight conditions that contributed to instructors' successful implementation of educational technology. Among them were: dissatisfaction with the status quo, existence of knowledge and skills, availability of resources, availability of time to learn the technology, existence of rewards or incentives to try it, participation in deciding how to implement the technology, commitment to the process, and continuing support from the leadership that showed enthusiasm for the work at hand.

Hybrid and Blended Instruction

Hybrid and blended courses combine the features of online and face-to-face instruction. For instance, students might attend classes at the university every other week, alternating with participating in an activity, such as watching an educational video and posting their responses to the class discussion board. The following week the students would meet face-to-face, where the teacher begins the class by leading a discussion about ideas expressed online. This method encourages students to watch the video on their own, allowing the instructor to use valuable class time for other activities. (Sawyer, 2000)

Students are able to stay connected between class meetings through required online communications. Instructors report getting to know students better through the use of online discussion boards, where students are required to contribute their thoughts, than

in a face-to-face class where some students do not speak up in discussions (Morgan, 2003). Instruction varies widely within hybrid and blended learning, but both instructors and students have reported positive opinions of blended instruction, to which some faculty attributed increased communications with students (Gahungu, Dereshiwsky, Moan, 2006).

Motivational theories

A concept related to the use of technology in the classroom is related to motivation. In this section, an overview of the most prominent motivational theories will be explained and an effort will be made to connect them to the current use of technology in higher education.

Process theories

Champion (2008), in her literature review of motivational theory, mentioned that **t**here are two major classifications of motivation theories: content theories and process theories. The process theory includes expectancy theory together with behavior modification or reinforcement theory, goal setting theory, and equity theory. All these theories focus on the importance of how to energize, direct, and sustain behavior (Kini &Hobson, 2002). Frederick W. Taylor, in his *Principles of Scientific Management* in 1911, was the one who originally defined this task. His use of the concept was, at the time, for blue-collar workers only. "The work of every workman was fully planned out by the management at least one day in advance, and each man received in most cases complete written instructions, describing in detail the task which had to be accomplished

as well as the means to be used in doing the work." (Taylor, 1992, p. 359) This theory later known as *goal setting theory*, states that specific goals influence what a person achieves and those goals lead to an improved performance. Research has shown that people who have specific goals tend to perform better compared to those with vague goals.

According to the theory, a goal is a method by which one can measure one's satisfaction; the more goals one reaches the higher one's satisfaction (Latham, 2004).

Goal setting has become a major factor in many programs. This theory is used to ensure that employees understand the goals and desired results of the organization's programs which involve the tasks. Also, research indicates that feedback boosts the efficacy of goal setting, Panza (2002) points out that results are measured by the performance of the organization's employees. She presents a human performance system comprised of four elements: expectations, resources, consequences, and feedback. The driver for the other three is expectations, as they drive the human performance system. All four elements must be considered in the system as they are linked to, and support, the process steps and the organizational results. A breakdown in any of the four elements can reduce the probability of success. Following are the main points of each element:

1) Expectations-performers must know clearly what is expected up front;

2) Resources-performers must have necessary job skills or learning and must be provided with the tools for required job tasks;

3) Consequences-these should support correct/desired performance;

4) Feedback-performers should receive information about their performance.

This feedback should be: relevant, accurate, timely, frequent, and specific (Panza, p. 37).

A second process theory is known as *equity theory*. Vroom and Deci (1992) stated that in equity theory "people will be most satisfied and work most effectively when they believe that their rewards or outcomes are in balance with their inputs." Equitable rewards are frequently determined from social norms and social comparative processes. In this theory, it is important to note that people must be rewarded equitably; those who are over-rewarded or under-rewarded can become uncomfortable. This theory involves a social support system that indicates people often compare themselves to others in their social group. Individuals often desire to maintain fair or equitable relationships, particularly on the job. For example, a lead team member of a group who receives open recognition may feel self-conscious when none of the other team members, who worked equally hard, are recognized.

Another process theory is reinforcement theory. This theory has its base in B.F. Skinner's theory of behavior control. "The concept of reinforcement is implicitly motivational" (Deci, 1992, p. 10). Satterfield (2004) states that reinforcement involves the idea that rewarded behaviors will be repeated and that incentives constitute the positive consequences required to ensure repeated behavior. But as has been pointed out: "Employers intuitively use rewards in their attempts to modify and influence behavior, but their efforts often produce limited results because the methods are used improperly, inconsistently, or ineffectively" (Hamner, 1974, p. 69).

Many workers are now considered self-managing, which requires more initiative and commitment on their part than incentives from their employer can elicit. This commitment or engagement depends on satisfaction which comes from the work itself. This intrinsic motivation is crucial for a company to keep good workers, as more workers are choosing to leave jobs that they consider unrewarding (Thomas, 2002). "With global competition, few organizations can afford the cost of recruiting and training replacements for many of their workers" (Thomas,2002, p. 8)

Expectancy theory, introduced by Victor Vroom in 1964, has three relationships to motivational behavior. According to Hersey and Blanchard (1988), the three parts include "a positive relationship between good performance and rewards, a positive relationship between effort and performance, and the delivery or achievement of valued outcomes and rewards" (p.29). In other words if a worker has a high degree of effort, this translates to increased performance which in turn leads to the reward that is due such a positive performance. Using the example of the person trying to use technology, a high effort would include many attempts that work out well. This in turn will lead to positive feedback and a connection built between effort and achievement that affects future performance. Hersey and Blachard warn that this could break down if their relationships do not hold true. If the person trying to use technology develops several online courses and works hard at developing video courses only to have things go wrong, the system has broken down. The delivery of value to the outcomes did not play out as expected. In future positions, the individual would probably work much less at using technology in the classroom. Essentially, due to this breakdown, the motivation to perform at the standards

already achieved would not be present, because the individual is unsure of the delivery of feedback that he or she feels is due.

Vroom's Expectancy Theory has been selected for this study because, according to Fudge and Schlacter (1999), this theory has been rigorously tested and has received strong support. Smith and Rupp (2003) also indicate that "expectancy theory provides a general framework for assessing, interpreting, and evaluating employee behavior" (p. 109). "Expectancy theory has also undergone extensive research in business and industry settings." (Howard, 1989, p. 201). Expectancy theory has become popular as a means of understanding motivation. Researchers have used the theory to test in a variety of settings with a number of adult populations, ranging from university students to public school teachers.

The results were varied as well, showing that the expectancy component of motivation is supported by the research, but "the individual elements of the theory are not consistently supported" (Howard, 1989, p. 201). He further states that the reason for this inconsistency lies in problems with the methodology and in a model which cannot fully explain the relation between the expectancy process variables and other variables, such as need satisfaction or reward system.

Vroom's Expectancy Theory is often referred to as the VIE theory, standing for the major components of the theory-valence, instrumentality and expectancy. The theory uses extrinsic and intrinsic motivators to describe the possible causes for behaviors in the workplace. The extrinsic motivators are those that bring about satisfaction through salaries, bonuses, commissions, perks, benefits and cash, while the intrinsic motivators,

such as pride of workmanship or the sense of helping customers come to the workers directly from the work they do (Thomas, 2002).

The VIE theory proposes three conditions that move an individual forward based on motivation:

1) That the expenditure of personal effort will result in an acceptable level of performance;

2) That the achieved performance level will bring about a specific outcome for the person;

3) That the achieved outcome is personally valued (Issac, Zerbe, & Pitt, 2001).

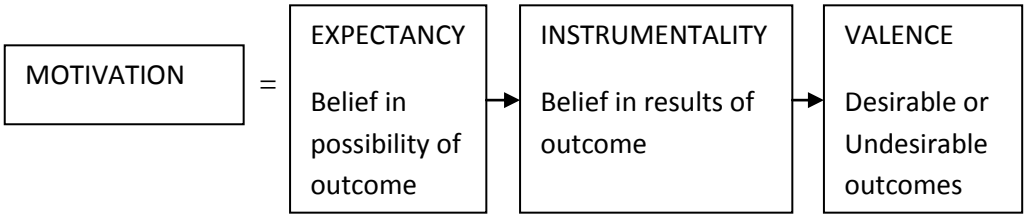


Figure 2.1*: Formula for Expectancy Theory*. From *Human Resource Development*. Desimone, Werner, & Harris, 2002.

Vroom stated: "Expectancy is defined as a momentary belief concerning the likelihood that a particular act will be followed by a particular outcome" (p. 20). His theory links expectancy with strength values: the greater the strength the more likely that the act will be followed by a certain outcome. Pinder (1984) stated that if a person judges that he can achieve an outcome, and then he will be more motivated to try; the higher the expectancy, then the more likely a person will exert energy to accomplish the outcome.

The second condition, Instrumentality, according to Vroom (1995), is an outcome association. Instrumentality is a probability belief linking one outcome (performance level) to other outcomes (Pinder, 1984). The range of Instrumentality could be:

1) + 1 strongly positive-performing a task will lead to a certain outcome;

2) 0 there is no relationship between the task and an outcome;

3) - 1 strongly negative-performing a task will prevent a certain;

It can take values ranging from -1, indicating a belief that attainment of the second outcome is certain without the first outcome and impossible with it, to +1, indicating that the first outcome is believed to be a necessary and sufficient condition for the attainment of the second outcome (Vroom, 1995, p. 21). Zero instrumentality usually means that there is no relationship between task and outcome. An instrumentality of -1 is one that will guarantee a negative outcome, such as being punished for negative actions.

The third condition, Valence, has the same ranges as instrumentality and refers to the value that an individual places on the outcome. Vroom (1995) refers to valence as "affective orientations toward particular outcomes" (p. 18). It is important to note that since valence is affective (emotional), there can be a difference between the valence of the outcome and the value of this outcome to the person. Vroom states that there may be substantial discrepancies between the desired outcome and the actual satisfaction. For example, a person may do his job satisfactorily because such performance may lead to a promotion.

The most important feature of valence concerns work-related outcomes and has to do with expectations and not with actual value. This makes expectancy theory abstract.

A person perceives a particular task outcome to be positive, negative, or indifferent according to the satisfaction or dissatisfaction he expects to receive. However, an original negative valence may later become a positive one. An example is a person who loses his job but finds that he is healthier, happier, and wealthier with a new job (Pinder, 1984).

Since, as previously indicated, all three factors are multiplied by each other, any weak factor directly impacts the other two, leading to increased or decreased success. For motivation to be established the individual must focus on all three factors in order to reach the desired goal. The individual can only be successful if he believes that he can be successful in the task, sees the connection between the success and the activity, and values the results of the success (Huitt, 2001).

The motivational theories described above can be used to help explain why faculty members use or do not use technology in the classroom. In addition to the concept both been rewarded tenure, the faculty member in a non-tenure track position may not use technology because all of his or her uncertainty of using it successfully. Thus, relative to expectancy theory there would be a high performance level and therefore no rewards for attempting to use the technology. If the rewards, for example a pay raise, do not materialize then the need for security, described by a Maslow, would not be met.

There were several studies that used Vroom's Expectancy Theory in their research. These studies focus on links between expectancy theory and leadership, learned helplessness, performance rating and pay, and faculty research.

Issac, Zerbe and Pitt (2001) seek to link expectancy theory and leadership concepts in order to determine if leader interactions with followers allow the establishment of higher motivational working environments. The researchers found that expectancy theory can be used by individuals to achieve their leadership goals by equipping them with the necessary tools to impact the behavior of their followers. High levels of performance occur when we establish motivational environments that inspire followers to achieve levels of performance that meet our expectations and perhaps exceed their initial beliefs in their own capabilities (Issac, Zerbe & Pitt, 2001, p. 223).

Schepman and Richmond (2003) investigated expectancy theory and the concept of learned helplessness. This concept of individual psychology states that if people see no predictable relationship between their actions and the outcomes of those actions, then they will learn to believe that they have no control over those outcomes. These researchers looked at one of the key conditions of expectancy theory, expectation. At its base, employees have to believe that they will have some control over the outcome associated with their own behavior. In other words, "the employees must believe that they will have the needed skills/abilities to achieve their performance targets expectancy." (p. 405). The study is used to further explore the relationship between expected control over future outcomes and the different levels of helplessness training. Schepman and Richmond (2003) conclude that in fact the lack of control may come from a perceived lack of skills or abilities rather than feelings of low-expectancy. Per Vroom (1995), expectancy is one important connection between requirements and the employees' perception of their ability to fulfill the necessary requirements.

Smith and Rupp (2003) looked at expectancy theory in relation to performance rating, pay scale, and motivation. Workers' motivation and general morale improve when they are a part of the decision making processes. The study found that the greater the possibility of decision making for an employee, the greater the sense of ownership for the outcomes of the decisions, which in turn lead to more engagement on the part of the worker. Simply put, people work harder because of the increased involvement and commitment that comes from having more control and say in their work people work smarter because they are encouraged to build skills and competencies; and people work more responsibly because more responsibility is placed in hands of employees farther down in the corporation (Pfeffer & Veiga, 1999, p. 39).

Chen, Gupta and Hoshower (2006) analyzed expectancy theory and factors that motivate business faculty to conduct research. This study focused on faculty members' perceptions of factors that influence research productivity from a behavior perspective and how these perceptions are translated into the motivation to publish. The study found a definite correlation between tenured and non-tenured faculty and how these two types of faculty view intrinsic and extrinsic rewards. This study shows that tenured faculty are motivated more by intrinsic rewards while non-tenured faculty is more motivated by extrinsic rewards. Chen, Gupta and Hoshower conclude that with "...successful application of expectancy theory, we were able to provide a better understanding of the behavioral intention (motivation) of faculty members' devotion to research" (p. 180).

Champion (2008) conducted a study regarding Victor Vroom's Expectancy Theory, and its impact on employees' task performance and engagement. The primary

question of this study was: “Will the use of Victor Vroom’s Expectancy Theory create a high valence in a corporate customer service team when it is applied in a pre-training module?” and to establish the existence of a relationship between expectancy and improved performance. The researcher predicted that the use of expectancy theory, using expectancy, instrumentality, and valence, as part of a pre-training module would have a positive effect of increase employee engagement in their work and its outcome on the division in general. The results of this study were inconclusive for a number of reasons. Increasing engagement did indeed seem to aid in accomplishing the goal of management, which was to decrease the number of errors and decrease employee retraining. Still, this study is inconclusive, as the statistics do not uniquely support the fact that the results were impacted only by the inclusion of the pre-training module. The researcher determined that the application of the theory could be used in other training initiatives to create a positive impact on the training results.

Several new theories emerged based on VIE: Porter & Lawler’s Expectancy Theory (1968) and Campbell, Dunnette, Lawler, & Weick’s Hybrid Expectancy theory. As shown in the Table 2.1, even if different researchers use slightly different terms, expectancy theories are comprised of two basic components: (1) expectancy and (2) valence (value of outcomes). In addition to these two factors, Porter & Lawler (1968) introduce the concepts of (1) abilities and traits, (2) role perceptions, (3) perceived equitable rewards, and (4) satisfaction. On the other hand, Campbell et al. (1970), propose external task goals and internal task goals.

Table 2.1: *Variations from the Expectancy Theory*:

Vroom	Porter & Lawler	Campbell, Dunnette, Lawler, & Weick
Expectancy: Perceived probability that effort will lead to good performance.	***Effort-Reward Probability***: the probability that reward depends upon performance and the probability that performance depends upon effort	***Expectancy I and II***: Expectancy I is a perceived probability of goal accomplishment, given a particular individual and situation and Expectancy II is a perceived probability of receiving first level outcome (rewards), given achievement of the task goal.
Valence: Value of expected outcomes to the individual	***Value of reward (Intrinsic rewards and/or Extrinsic rewards)***: the attractiveness of possible outcomes to individual.	***Valence of first-level outcomes and second-level outcomes***: first-level outcomes (incentive or reward) and second-level outcomes (needs satisfaction) have specific valences.
Instrumentality: Perceived probability that good performance will lead to desired outcomes.	There exists a positive relationship between performance and rewards (desirable outcomes or returns to an individual).	The valence of a first level outcome is a function of the ***Instrumentality*** of that outcome for obtaining second level outcomes and valences of the relevant second level outcomes.
	• ***Abilities and Traits*** • ***Role Perceptions*** • ***Perceived Equitable*** • ***Rewards*** • ***Satisfaction***	• ***First-level outcomes*** • ***(Incentive or Reward)*** • ***Second-level*** • ***outcomes (needs*** • ***satisfaction)*** • ***External task goals*** • ***Internal task goals***

Essentially, the motivation to use technology relates to personal needs and if using the technology in the classroom will not meet those needs then it will be futile for the faculty member to attempt to use it. The next discusses the use of technology use in higher education.

Use of technology in higher education

The use of technology in education is a major issue today for administrators and faculty members. When academics gather to discuss technology, there is a great deal more to discuss than the use of computers, including video, audio tapes, language laboratories, and various forms of telecommunications.

In a report from the American federation of teachers (ATF, 1996), sponsored by AFL-CIO, concerning technology in higher education, there was information published about how technology was used in higher education. They found some interesting information. "According to one study, nearly one third of faculty has made use of software in the classroom." (p.4). It was also noted in the report that the task force, assigned to investigate the use of technology for instruction, believes the number "who use technology for instruction as a matter of course is probably lower, between five and ten percent" (p.4). From the AFT's report it was unclear what percentage of faculty members were using software in their classrooms. The report was also vague concerning the use of electronic mail in higher education. While 13% of the faculty may use electronic mail for classroom purposes, another 20% may use e-mail for research or other purposes.

MacDonald and Watson (1970) provided an example of technology being used in the classroom. They are librarians at Florida Southern College (FSC). In their article, they pointed out that in the fall of 1996, FSC had installed "a campus-wide network for electronic mail and graphic Internet and World Wide Web access. (p.1).This brought an

interchange from the information superhighway to the FSC campus. The authors volunteered to use this new technology in the classroom. They used sections of the freshman seminar to implement the new technology. The technologies they used included presentation software in class, electronic mail to communicate assignments and to facilitate student-instructor, and the WWW for research purposes and a class project. They found that "nearly all students met basic course requirements, with many exceeding expectations" (p.3). They also noted that the use of such technology can be implemented in the classroom and provides an example of what is currently happening on college campuses.

A study from Rosen (1995) demonstrated the steps an instructor should take to bring the WWW into the classroom. Rosen points out "it is important to remember that the WWW is merely a tool, as it is chalkboard, overhead projector, or VCR, tools don't teach" (p.1). This is important to understand, as many instructors may believe that introducing technology into the classroom means taking the instructor out of the role as teacher. The concept is to integrate the tools into the classroom and not to have the technology to replace the instructor. Rosen (1995) provides steps to integrate the WWW into the classroom. She says, the instructor must be comfortable with the technology and the technology must help the students meet the goals of the class. Implementing the WWW is a bit tricky because of the amount of information available.

Rosen (1995) notes that specific goals are extremely important to avoid overwhelming the students with the amount of information available. Rosen notes that

specific goals are extremely important to avoid overwhelming the students with the amount of information available. She also notes that instructors using technologies, such as the Internet, may encounter technical problems. There are ways around this and instructors can use many resources available on most campuses to help with what she calls" anti-glitch insurance" (p.2).

A final important point is that there must be some sort of assessment for the technology. This helps instructors evaluate how students learn and how technology enhanced that learning. She suggests that faculty members become creative in their assessments and to move away from the "traditional test of the facts" (p.3).

While there are many positive uses for the new and emerging technologies, there are also warnings about negative aspects of technology. Nigohosian (1997) mentioned that World Wide Web is a powerful tool, but the quality of information it provides also can be difficult to assess. Using his own students he demonstrated an example his community college history course. The students were asked to search the word "slavery" in the search box and analyze the results. He was trying to make the point that from the 25 hits that were returned to the viewer, only about 3 were of any value at all. Nigohosian (1997) emphasized that using technology could help the learner by finding many high quality sources if the learner identified the research needs.

Another important issue is the validity of the information. The researcher should review the author's reputation, the currency of the information and look for any affiliations or bias in the article related to external motivation. Sometimes articles are

being written to boost the value of a product as a result of author or article sponsorship from the maker of a product being discussed. That's why some materials might be subjective and require a careful review. While there are potential problems in doing the research on the internet, Nigoshosian (1997) believed that there are opportunities for the savvy researcher. However, he warns that the future may find "students subject to a more massive manipulation by the media and the information industry" (p.9).

The next chapter will describe and discuss in detail the methodology, variables and procedures used in this study.

CHAPTER THREE

RESEARCH METHODOLOGY

The purpose of this study was to investigate faculty motivation associated with the use of course management systems to support classroom learning and teaching. Course Management Systems (CMS) have been adopted by many institutions of higher education and they are still mostly used for administrative purposes and less for teaching. With the emergence of new mobile technologies, students are demanding that faculty diversify their teaching methods and include CMSs on a larger scale. There are several course management systems available to be used in higher education. Currently, one of the most popular CMSs used is Blackboard Academic Suite. According to a 2009 survey done by Instructional Technology Counsel, Blackboard's market share among ITC's constituents was about fifty nine percent. Moodle and Sakai are Blackboard's biggest competitors.

For this study, Blackboard was selected because it of its wide spread use and familiarity. The aim of this study was to look at what motivates faculty to use a Course Management System and attempt to explain how the process of motivation takes place using Vroom's Expectancy theory.

This chapter includes a description of the research design, the identification of the research variables, and the statistical procedures used in the study. Additionally, the chapter covers the instrumentation, data collection techniques, and the data analysis for the study.

Research Design

The research design used in this study was a combination of quantitative and qualitative methods. Using both methods helped the researcher examine different relationships between the variables of this study.

The purpose of a quantitative research design was to generalize from a given sample to a similar population so that inferences would be made about a behavior or characteristic (Creswell, 1994). Quantitative research methods were used to characterize faculty by determining what proportion of them has certain behaviors, behavioral intentions, attitudes, and knowledge related to Blackboard usage and motivation.

The qualitative research design method used in this study helped design some aspects of the survey questions that were used to gather information relevant to this study. Open-ended questions were used to obtain more information from the participants. The combination of the two methods of research allowed assessing what qualitative methods or quantitative methods could not accomplish individually.

The data were collected during a specified period of time from the targeted sample population, which were analyzed and described to explain the relationships between variables of the study using the appropriate statistical procedures. Creswell (1994) stated that a researcher must "provide a rationale for the data collection procedure by using arguments based on costs, availability, and convenience" (p. 119). The research survey was developed with the help of Subject Matter Experts and based on previous

Expectancy theory (VIE) and Course Management Systems (CMS) research. The study instrument used was modified to meet the needs of this research.

The research model was tested using Vroom's Expectancy theory (VIE). The expectancy theory of motivation of Victor Vroom, unlike Maslow's and Herzberg's theories does not concentrate on needs, but rather focuses on outcomes. Thus this study was interested in examining what outcomes influence faculty motivation to use Blackboard. The specific aim of this study was to (1) investigate if the elements of VIE theory formula predict faculty motivation to use Blackboard and (2) examine the relationship between Valence, Instrumentality, Expectancy and Faculty Motivation to use Blackboard tools.

Research Questions and Hypotheses

The following research questions guided this study:

1. Does the VIE model predict faculty motivation to use Blackboard?
2. What is the strongest motivational factor that drives faculty to use course management tools in facilitating classroom teaching?
3. Is there a relationship between Valence and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?
4. Is there a relationship between Instrumentality and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?
5. Is there a relationship between Expectancy and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?

6. Does a faculty member perceive using Blackboard course management tools as saving time?
7. Is there a relationship between utilization of course management tools and gender?

Research Hypotheses

To address the research questions, the following hypotheses were tested.

Hypothesis 1: There is a relationship between faculty member's motivation to use Blackboard and the Elements of VIE theory.

To test the hypothesis, the researcher conducted a multiple regressions analysis to view the relationship between faculty motivation to use Blackboard tools and the elements of Expectancy Theory (VIE).

Hypothesis 2: Valence is useful in predicting a faculty member's motivation to use Blackboard.

To test this hypothesis, a regression analysis between faculty motivation to use Blackboard tools and Valence was conducted.

Hypothesis 3: Instrumentality is useful in predicting a faculty member's motivation to use Blackboard.

To test this hypothesis a regression analysis between faculty motivation to use Blackboard tools and Instrumentality was conducted.

Hypothesis 4: Expectancy is useful in predicting a faculty member's motivation to use Blackboard.

To test this hypothesis the researcher utilized a regression analysis between faculty's to use Blackboard tools and Expectancy.

Hypothesis 5: A faculty member perceives using Blackboard course management tools as saving time.

The researcher was interested to see if Blackboard is perceived as saving time when it is used in the didactic process. T-tests were used to analyze the data to see if the answers support researcher's claim that Blackboard did save time.

Hypothesis 6: There is a relationship between utilization of course management tools and gender.

The question related to gender and the use of course management tools was addressed by doing a non-parametric analysis between gender and use of Blackboard tools, a Chi Square analysis helped calculating this relationship.

Sampling and Data collection procedure

This study used a stratified random sampling design to conduct the self-administrated survey. Since this study was intended to analyze motivation in academia, the target population consisted of faculty members from twelve universities included in the Atlantic Coast Conference (ACC). The following twelve universities are part of this organization:

- Boston College,
- Clemson University,
- Duke University,
- Florida State University,
- Georgia Tech,
- University of Maryland,
- University of Miami,
- University of North Carolina at Chapel Hill,
- NC State University,
- University of Virginia,
- Virginia Tech, and
- Wake Forrest.

After a background analysis, only 11 schools listed in the ACC used Blackboard as their main Course Management System as of October, 2009. Georgia Tech was using T-Square since 2007, thus faculty from Georgia Institute of Technology were not included in this study. During the process of data collection and analysis, the survey results revealed that Virginia Tech was in the process of converting to Scholar, the University of Virginia was moving to Collab Course Management System and NC State to Moodle.

Sample size

The sample is the selected group of people chosen to participate in a study. The researcher decided to randomly select ten participants from five specific colleges: Business, Arts, Sciences (Engineering), Education, and Health or Medicine. This procedure selected forty faculty members from every university, resulting in an initial total of 440 survey participants.

After the first email was sent to faculty, eight invalid email addresses were reported that they could not be delivered. In the second phase of the data collection, the researcher added another eight participants from the ACC universities that were still using Blackboard. This was done to compensate for the loss of those eight email addresses that were undeliverable. The first phase of the data collection showed that another three schools from the ACC were transitioning from Blackboard to a different courser management system. All the selected participants were added to a database that was used during the data collection. The contact information of every individual participant was publicly available on their institutional websites.

Usually, the sample size needed for a statistical analysis is dependent on the type of the analysis. When calculating a sample size, several factors are taken into consideration. These are: the power of the study, the effect size, variance and finally the level of significance. The power of a statistical test is the probability that the test will reject a false null hypothesis. As power increases, the chances of a Type II error decrease (Cohen, 1988).

The level of significance in hypothesis specifies the maximum allowable probability of making Type I error. The most common level of significance is 0.05 and 0.01.

It is also important to take into consideration the type of analysis to be conducted. This type of analysis will determine the appropriate number of observations needed to make a proper statistical inference. Since the main analysis in this study is based on multiple regressions, the minimum sample size required to run this study, according to the statistical calculators of Soper (2010), was 76 participants. The following parameters were used in the calculation of the sample size: alpha level of 0.05, three predictors, an anticipated effect size of 0.15 (by convention, effect sizes of 0.02, 0.15, and 0.35 are considered small, medium, and large, respectively) and a statistical power level of 0.8. The statistical power should be greater or equal to 0.8 (Keuhl, 2000).

Development of research instrument

The instrumentation of this study was developed based on findings from a comprehensive literature review. Specifically, previous studies of the expectancy theory by Chiang (2006); Miskel, Bloom & McDonald (1983) and research based on motivation were analyzed. Advice and recommendations from subject matter experts knowledgeable in Vroom's Expectancy theory was used to design and modify the research instrument in this study.

Previous research showed that that faculty motivation is affected by internal and external factors that result from subjective beliefs of choices among various options of effort leading to different outcomes. Typically, the following strategies to motivate

faculty are used: encouraging creativity and peer coaching; financial and moral support; providing ongoing staff development; offering flexible technology choices; addressing faculty complaints; explaining the relevance of educational technology, etc (Ennis, W &Ennis, D. 1996). Several other motivation strategies were selected based on their importance and relevance to be included in the design of the survey. Those strategies were included in the questionnaire of the survey for interviewing faculty that was using Blackboard.

The researcher referred to the study of Colorado & Butler (2007) about the Blackboard features used by faculty to identify the most useful and least useful Blackboard tools to be included in some of the survey questions. According to their survey the top five most useful Blackboard features were: Assignments, Gradebook, Email, Discussion Board and Announcements. The least five Blackboard features were: Electric Blackboard, Virtual Classroom, Adaptive Release, Virtual Chat and Address Book. Different features in Blackboard have been observed by other scholars (Anderson, 2003; Halawi and McCarthy, 2007; Heaton-Shrestha, Gipps, Edirisingha, and Linsey, 2007; Woods, Baker and Hooper, 2004).

Another source for the development of the instrument was the Expectancy theory of motivation developed by Vroom (1964), which explains the process of individual decision making for various behavioral alternatives. The original expectancy theory is calculated using the following formula:

Motivation force= Valence x Instrumentality x Expectancy

The force of motivation is theorized to be a product of expectancy, instrumentality and valence. Vroom proposed that each individual could use this formula to carry out mental calculations, which are approximated by this formula, resulting in a force of motivation performed in action. The elements of the Expectancy theory used in this study were in a multiple regression using an additive model. Such as Expectancy plus Instrumentality and Valence were predicting Faculty motivation to use Blackboard tools, not to be confused with the Force of Motivation that is defined by a multiplication in Vroom's theoretical model.

Questions related to expectancy were developed taking into account that expectancy is based on the perceived effort-performance relationship. One's effort should lead to the desired performance and is based on the past experience, self-confidence, and the perceived difficulty of the performance goal. Expectancy could be influenced by individual's past and personal experience with this course management tool.

Instrumentality is based on the perceived performance-reward relationship. Instrumentality is the belief that if one does meet performance expectations, he or she will receive a greater reward. Both internal and external factors were taken into consideration when the survey questions were developed. Internal factors included: personal job control, feeling of accomplishment, faculty reputation, etc. Among external factors the researcher included: better pay, promotions, and better student evaluations.

Valence is the value the individual places on rewards. This is a function of needs, goals and values. Vroom (1964) mentions "Valence" and Porter & Lawler (1968) state

"value of reward". Regardless of the terms, these concepts represent individual's subjective judgment about possible outcomes. As a result, there can be substantial discrepancy between the anticipated value of an outcomes and the actual value from an outcome (Vroom, 1964).

Survey instrument

To collect data, the researcher used a questionnaire consisting of forty questions. The instrument consisted of both open-ended questions and multiple choice questions (Appendix A). Among the questions asked, there were thirty two related to the subject researched and eight demographic and classification questions. For data confidentiality and tracking each participant was assigned a number for data encoding.

To measure each variable, the researcher asked several questions per each variable.

Questionnaire:

The questions of the survey were divided into several sections:

- Questions related to experience and use of Blackboard

  This part of the survey consisted of two questions related the use of Blackboard. The first question could be answered with a yes/no. A "yes" answer, allowed the participant to continue with the regular survey. If a participant selected the "no" answer, that took the participant directly to the demographic section and asked the person several questions about their decisions for not using Blackboard. Question two asked about the number of courses taught with Blackboard.

- Questions related to expectancy

There were seven questions designed to measure a participant's beliefs about the probability of certain outcomes when using Blackboard. Questions related to Blackboard included: spending more time setting up courses; saving time on professorial activities; helping better organize course materials; engaging students with different learning styles; extending teaching beyond classroom; leading to a feeling of accomplishment and doing the job more effectively.

- Questions related to instrumentality

The questions related to instrumentality measured the probability of getting certain rewards attainable while using Blackboard. Participants were asked opinions about: getting better pay, opportunities for promotion, getting better ratings on student evaluations, improving reputation among colleagues and department chairs, having more control over the job by using the spare time on other activities, having a feeling of accomplishment, having a better reputation among students and that the department values their use of Blackboard.

- Questions related to valence

Questions in this section were similar to those that measured instrumentality. Participants were asked to rate the importance of each outcome that might result from using Blackboard, namely: getting better pay, opportunities for promotion, getting better ratings on student evaluations, improving reputation among colleagues and department chairs, having more control over the job by using the spare time on other activities, having a feeling of accomplishment, having a better reputation among students and that the department values their use of Blackboard.

- Questions related to satisfaction using Blackboard

The researcher developed four satisfaction related questions in this section. The purpose of this section was to estimate the level of satisfaction with Blackboard. Two of the questions asked about the level of effort in the past and present and two questions about their experience and satisfaction in using Blackboard.

- Questions related to motivation to use Blackboard tools

Nine Blackboard tools were selected for these questions. These tools fell into two categories: tools that are most useful and the least useful. These tools included: Course assignments, Grade book, Discussion board, Email, File exchange, E-reserves, Virtual classroom, Calendar and Adaptive release.

- Questions related Intention to use Blackboard tools

Intentions are the most important factor when forming one's process of motivation. Three questions were designed to measure this construct. Participants were asked to rate their likelihood of using Blackboard next semester, the amount of money they would pay for Blackboard if they had to buy it and how likely they were to recommend this Course Management System to other colleagues.

- Demographic questions: Gender, Age and Position or Title, etc.

This section of the survey had two sections. The first was for users of Blackboard and the second for non users. The participants were asked to fill out the demographic information that was used for classification purposes. Non-users had one supplemental question about the reasons behind not using Blackboard. They were given several answer options plus a fill in the blank response.

Variables

In this section the researcher listed the variables used in this study and explain how they were defined.

Faculty Motivation to use BB tools is a cumulative variable based on the participants' scores from nine questions related to motivation to use Blackboard tools (Q30). The numerical value for this variable was computed using the formula below. The names of the variables listed were names of variables used in SPSS.

TotalMotivationBBTools= (MotCourseAssign + MotGradeBook + MotDiscussBoard + MotEmail + MotFileXchange + MotEreserves + MotVirtualClass +MotCalendar + MotAdaptiveRelease)/9.

Where TotalMotivationBBTools denoted the variable Faculty motivation to use BB tools, and the factors in the parenthesis denote each motivation to use each tool respectively. This variable was the dependent variable in the multiple regression analysis.

Expectancy was one of the independent variables. Expectancy numerical values have been obtained from questions three through eight of the survey. The following formula was used to calculate the variable:

TotalExpectancy= (E1TimeSetup +E2SaveTime + E3BetterOrgnz + E4EngageStud + E5ExtendClass +E6FeelingAccom +E7DoJobEffect)/7

.

Variables in the parenthesis are marking expectancy measured from seven questions. Coding: E-stands for expectancy; followed by the number of the expectancy question and a short description.

Instrumentality was another independent variable in this study. A total of seven questions related to instrumentality were used to evaluate participants' responses. Data for this variable were collected by survey questions number 10 through 16. It was calculated using the formula below:

TotalInstrumentality=(I1BetterPay + I2OppForProm + I3BetterStudEval + I4NotHurtRep + I5MoreJobControl + I6FeelAccompl + IE7BetterRepStud)/7.

Coding: I-stands for instrumentality; followed by the number of the instrumentality question and a short abbreviation for its description.

Valence was the last independent variable of the model and also consisted of seven valence variables. Survey questions 17 through 24 collected data for this variable.

TotalValence=(V1BetterPay + V2OppForProm + V3BetterStudEval + V4NotHurtRep + V5MoreJobContr + V6FeelAccompl + V7BetterRepStud)/7.

Coding: V-denotes valence, followed by the number of the valence question and a short description

Intentions- this variable was constructed based on the data collected from questions 31 through 32. The following formula was used:

Intentions= mean (LikelyToUseBBNextSemstr, MoneyToLicence, LikelyToRecommBB)

Data Analysis

Pilot study

A pilot study was conducted before the actual data collection. The aim of this procedure was to test the reliability and validity of the study instrument. The pilot study was conducted using 10 faculty members at Clemson University. Surveys were distributed to the committee members, who selected 10 people in their departments and asked them to fill out the questionnaire. The main concern of the researcher was to make sure that the questions being asked were understood and produced the desired answers related to the VIE elements. All of the participants were asked to evaluate the survey and provide suggestions. Feedback from these sources helped the researcher better understand how effectively the instrument measured the variables of the research questions. Upon completion of the pre-testing, comments were made to rephrase certain questions, eliminate filler words and be more concise on certain time phrases. Overall, the participants in the pre-testing phase were satisfied with the survey and suggested to modify the following:

1. Move all the questions related to demographics and classification to the end of the survey.
2. Change the rating scale from seven to five items. It was going to benefit the participants by giving them fewer options to choose from, as a result reducing the time needed to respond to the survey, and for the researcher, facilitating the process of data coding and analysis.

3. Change the wording in two survey questions (13, 21) turning them from negative to positive implications, i.e. Not hurting to improving. These changes made the rating scales consistent and positive, also improved the readability and helped the participants better understand the questions.
4. Reword and shorten the directions for each section of the survey.

Validity

The validity of the instrument in this study was assessed through content validity, pre-testing and a pilot study.

Content Validity

The questions of this survey instrument were designed taking into consideration formats, recommendations and wording specific to the Expectancy theory. Expectancy questions typically have to address personal beliefs from effort- performance relationship. Instrumentality assesses the probability of getting a reward in the performance-outcomes relationship. Valence estimates the subjective value each individual places on rewards.

Internal consistency was improved as a result of changing the problematic survey questions. Being asked to estimate the likelihood of each event occurring, the initial question of "Not being punished for not keeping up with school policies" was modified to "Improving my reputation among colleagues and department supervisors". Also "Nothing, my department does not value the use of this course management tool was

changed to “Overall, my department values the use of this course management tool.” The negative wording seemed to confuse most the participants involved in the pilot test.

Reliability Test

To test the reliability (coefficient alpha value) of the constructs the researcher tested all the items of the survey except for the demographic and classification part. A coefficient of 0.747 was achieved indicating a good level of reliability. A separate test was conducted for each construct and component. The results of this test are presented in the Table 3.1 below:

Table 3.1: Cronbach’s alpha for questions of the survey

Constructs and Components	Coefficient Alpha
Total Expectancy	**.829**
E1-Time to setup	.645
E2-Time I save	.863
E3-Better organization of courses	.898
E4-Engage students with different learning styles	.854
E5-Extend my teaching beyond classroom	.851
E6-Feeling of accomplishment	.906
E7-Do my job more effectively	.792
Total Instrumentality	**.757**
I1-Better pay	.680
I2-Opportunities for promotion	.922
I3-Better student evaluations	.686

Table 3.1 Continued

I4-Improving reputation among colleagues	.473
I5-More Job control	.906
I6-Feeling of accomplishment	.909
I7-Better reputation among students	.768
I8-Department values the use of CMS	.714
Total Valence	**.656**
V1-Better Pay	.656
V2-Opportunites for promotion	.780
V3-Better student evaluations	.853
V4-Improving reputation among colleagues	.322
V5-More job control	.875
V6-Feeling of accomplishment	.928
V7-Better reputation among students	.750
V8-Important that department want to use CMS	.085

Data collection

Taking into consideration that this was a study of a technological tool, the researcher decided to use a web based survey, eliminating the need to mail regular paper surveys. This method of data collection was less costly, relatively easy and took less time compared to regular mail or personal survey. According to a recent study, the survey medium does not seem to have a significant effect on overall study results (Walt, Atwood, & Mann, 2008).

Before any data collection could be done, the survey was approved and mandated by the Institutional Review Board at Clemson University (Appendix C), which was necessary according to Federal laws and regulations. The surveyor had to ask permission from every IRB office of each university participating in the study. This was done at the recommendation of Clemson IRB office.

To facilitate the process of data assessment, the selected faculty members received a customized standard letter (Appendix B) via email and were asked to complete the survey online. A letter explaining the purpose and survey questionnaire was included in that email. The letter contained a link in the body of the message, redirecting the participant to www.surveymonkey.com where the survey instrument was located.

The researcher had to take into consideration that even though Blackboard was used at the universities included in this study, there was no guarantee that all the people who had been selected to participate were users of this CMS. Because of this, logic questions were added to the survey, where faculty members that did not use this tool were redirected to a short non-user survey, asking them about the reasons for not using Blackboard. This allowed collecting supplemental statistical data about the non-users of Blackboard.

Thirty days were dedicated to data collection procedures. Partial or delayed answers were eliminated from the study. There was a courteous follow up by email to remind the participants about the survey completion. Upon the completion of data

collection, all the information was downloaded from the web site to a secure location and encoded accordingly.

Data coding

Data entry and coding in this study was done in three steps:

1. Coding of the survey questionnaire
2. Initial data entry and output
3. Final data retrieval and coding for statistical analysis.

Coding the Questionnaire

The questions of the survey were designed using a five point Likert-type scale. The response to each statement was coded to numerical values ranging from one to five. Depending on the questions the values of the scales had different descriptions.

In the section of the survey where expectancy was evaluated the numerical option indicated the following:

1-Never 2-Seldom 3-Sometimes 4-Often 5-Almost Always

In the sections concerning instrumentality and intentions the answer options were:

1-Not likely at all 2-Somewhat likely 3-50/50 chance 4-Quite likely 5-Extremely likely

For Valence section the answer options were:

1-Less important 2-Moderately important 3-Important 4-Quite important 5-Very important

In the section where participants were asked to rate their experience using Blackboard, the answer options were:

1-Very low 2-Low 3-Moderate 4-High 5-Very high

Questions 28 and 29, related to the level of satisfaction using Blackboard, as well as the section related to the motivation to use Blackboard tools both had the following options:

1-Not at all 2-Not very 3-Neutral 4-Somewhat 5-Very much

The statement evaluating the license price in question 32 had the following scales:

1) *$0 to$100 2) $100 to $200 3) $300 to $400 4)$400 to $500 5)$500+*

Upon the initial data entry process, the hard copy of the survey was printed and data was verified to control any data entry errors. The last step of the process consisted of downloading the raw data from the dedicated survey web site and inserting all the data into a spreadsheet of study variables.

Survey Data Analysis

The data resulting from this study were analyzed using SPSS for Windows version 17.

Descriptive Statistics

Descriptive statistics provided the researcher with an overall view of the distribution of data. In order to have a full data set and to make sure that all the questions of the survey were answered, missing values in this study were controlled by a JavaScript code embedded in the online questionnaire. If a participant skipped or missed an item, the JavaScript code on the survey page reminded the participant to complete all items before the submitting the answers.

It was important to examine outliers because they can cause a regression model to be biased and affect the values of the estimated regression coefficients. The researcher

was able to assess the presence of outliers through the values of residuals. Cook's distance in SPSS showed how significant those distances were. Means and standard deviations provided the researcher an indication of the centrality and variability of the data. Correlation matrixes provided an overall view of the correlation between variables. Normality of data was identified through a histogram with normality curve.

The following relationships were analyzed:

- Expectancy, Instrumentality, Valence and Motivation to use Blackboard tools
- Expectancy and Motivation to use Blackboard tools
- Instrumentality and Motivation to use Blackboard tools
- Valence and Motivation to use Blackboard tools
- Intentions and Time
- Gender and Blackboard use.

Multiple Regression Analysis

A multiple regression analysis was conducted using SPSS to assess the importance of the three variables: expectancy, instrumentality and valence.

The multiple regression equation was represented by the following:

$$Faculty\ Motivation\ (Y) = B_o + B_1E + B_2I + B_3V$$

The values for the weights, B_o and the B_js, were determined using the method of least squares.

In order to draw the correct conclusions about the regression there were several assumptions examined concerning multiple regression analysis that needed to be met.

Using Chang's (2008) methodology as a guide and statistical procedures related to multiple regressions, the following assumptions were examined:

1. Independence was achieved by making sure that each outcome variable was collected from separate participant.

2. Normally distributed errors involved looking at Normal *P-P* plot of *Regression Standardized Residual*. To meet this assumption all points have to lie on the line of normality.

3. Homoscedasticity was checked using the graph of *Regression Standardized Predicted Value* (**ZPRED*) against *Regression Standardized Residual* (**ZRESID*). The assumption was met because all the points were randomly and evenly dispersed throughout the plot and about a horizontal line of zero.

4. Multicollinearity shows the strong correlation between two or more predictors in a regression model. Multicollinearity may pose a threat to the validity of multiple regression analysis because it makes it difficult to assess the importance of the individual predictors. Multicollinearity would also increase the variances of the regression coefficient resulting in an unstable predictor equation. The researcher looked the values of correlations all of the predictor variables to see if high correlations (.80 or .90) exist. The value of *VIF* (variance inflation factor) indicated whether a predictor had strong linear relationships with the other predictors, also VIF should be below 10.

CHAPTER FOUR

FINDINGS AND ANALYSIS

The purpose of this study was to determine if the elements of the Expectancy theory predict faculty motivation to use a course management system like Blackboard. The collected information served for the investigation of the following specific research questions:

1. Does the VIE model predict faculty motivation to use Blackboard?
2. What is the strongest motivational factor that drives faculty to use course management tools in facilitating classroom teaching?
3. Is there a relationship between Valence and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?
4. Is there a relationship between Instrumentality and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?
5. Is there a relationship between Expectancy and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?
6. Does a faculty member perceive using Blackboard course management tools as saving time?
7. Is there a relationship between utilization of course management tools and gender?

From 448 faculty members surveyed, 121 of them responded to the web survey. Among the respondents, 101 indicated that had used Blackboard previously and twenty had not. The response rate to this survey was twenty seven percent.

Data Collection

The procedure of data collection started with the input of contacts into the database on the dedicated website (surveymonkey.com). The first email invitation for participation was sent on February 23, 2010 to a list of 448 people that had been previously selected and categorized. To remind the participants about the completion of the survey, a follow-up email was sent on March 10, 2010. The second email was sent to 371 participants who had not completed the survey before March 10, 2010. The programming on surveymonkey.com allowed the message to be sent just to the list of participants who had not yet responded. Four weeks into administration of the survey provided 121 responses; twenty people had no previous experience or were not users of Blackboard. The initial design of the survey allowed collecting some information about non-users of Blackboard as well. Demographic, classification and information about the reasons for not using this Course Management System was collected as well.

Table 4.1: *Summary of respondents*

	Initial email responses	Second email responses	Net responses
Users	69 (89.6%)	32 (72.7%)	101 (83.5%)
Non-users	8 (10.4%)	12 (27.3%)	20 (16.5%)
Total	**77 (100%)**	**44 (100%)**	**121 (100%)**

Data screening

Several scales were used in the study. Among scales used were "yes" and "no" questions, check all that apply, a 5 point Likert-type scale and an a fill in the blank option was available for several questions.

The "yes" and "no" questions at the beginning of the survey allowed differentiating and directing users and non-users of Blackboard to different sections of the survey. Non-users skipped the whole survey and were asked to complete the demographic data and select reasons for not using Blackboard, while users were asked to answer the complete questionnaire. Programming each question prevented the participants from skipping answers and going to the next page. This was set to make sure every question that was needed for analysis of this study was answered by the participants.

Check all that apply questions did not control for missing data, because it was valid for participants for leave boxes unchecked. If the available responses in those

questions did not meet the conditions of the respondent, they had a chance to fill the "other" option that allowed for input of personalized text.

During the initial process of data collection, feedback from survey participants allowed correcting some programming issues that were not obvious during the pilot test of the survey. Specifically, in the "check all that apply question", there was a code that would not allow leaving the boxes unchecked and just choosing "Other."

Descriptive Analysis

Demographic data collected from both users and non-users of Blackboard included answers to questions related to gender, age, years of teaching in higher education, specialization area, faculty rank and tenure status. For descriptive analysis, data from 121 respondents was used. Only 101 participants who used Blackboard were included in the analyses involving multiple regressions.

Findings

The following is the summary of all responses for each survey question. The responses have been summarized and presented in tables below.

Section 1: Users and non-users of Blackboard

Question 1: Have you ever used any Blackboard course management tools?

From 121 participants in the survey, the percentage of the participants that used Blackboard was 83.5%, while the percentage of participants that did not use Blackboard was 16.5%.

Question 2: How many courses have you taught using Blackboard?

The data collected showed that from 101 faculty members: 10 participants or 9.9% have taught just one course using Blackboard; 4 participants or 3.9% taught two courses; 8 participants or 7.9% have taught a total of three courses; 7 participant or 6.9%; four courses 72 or 71.4% of respondents or claimed that they taught five or more courses using Blackboard.

Section 2: Elements of the Expectancy theory (VIE)

This section included eight questions related to expectancy; every question was measuring a specific expectancy related to Blackboard use.

Expectancy (Questions 3 through 9)

Table 4.2*: Using Blackboard will result in spending more time setting up my courses.*

Never	Seldom	**Sometimes**	Often	Almost Always
9.9% (10)	22.8% (23)	**24.8% (25)**	23.8% (24)	18.9% (19)

The results revealed that answers in the range of sometimes to almost always account for 67.5 % (68) percent of the responses.

Table 4.3*: Using Blackboard will allow me, in the long run, to save time for other professorial activities.*

Never	Seldom	Sometimes	**Often**	Almost Always
5.9% (6)	16.8% (17)	28.8% (29)	**38.6% (39)**	9.9% (10)

Participants agreed that Blackboard does save them time in the long run (sometimes to almost always), accounting for 77.3(78) % of the total responses.

Table 4.4*: Using Blackboard would allow me to better organize my course materials.*

Never	Seldom	Sometimes	**Often**	Almost Always
2.9% (3)	11.9% (12)	17.8% (18)	**44.6% (45)**	22.8% (23)

Data showed that 85.2% or 86 participants with answers ranging from sometimes to almost always expect Blackboard to help them better organize their course materials.

Table 4.5*: Using Blackboard would allow me to engage more students with different learning styles*

Never	Seldom	**Sometimes**	Often	Almost Always
8.9% (9)	29.7% (30)	**40.6% (41)**	13.9% (14)	6.9% (7)

According to the answers, 61.4% or 62 faculty members expected that with the help of Blackboard they could engage students with different learning styles.

Table 4.6*: Using Blackboard could allow me to extend my teaching beyond my classroom*

Never	Seldom	**Sometimes**	Often	Almost Always
7.9% (8)	27.7% (28)	**28.7% (29)**	23.8% (24)	11.9% (12)

Data showed that 64.4 % or 65 faculty members' responses or fall into the category between sometimes and almost always.

Table 4.7*: Using Blackboard may lead to a feeling of accomplishment*

Never	**Seldom**	Sometimes	Often	Almost Always
24.7% (25)	**40.6% (41)**	24.8% (25)	5.9% (6)	4.0% (4)

Faculty expectancy that Blackboard might provide them with a feeling of accomplishment was 34.7% or 35 responses ranging from sometimes to almost always.

Table 4.8*: Using Blackboard allows me to do my job more effectively.*

Never	Seldom	Sometimes	**Often**	Almost Always
1.9% (2)	17.8% (18)	25.8% (26)	**38.7% (39)**	15.8% (16)

Data showed that 80.3 % or 81 respondents (sometimes-often-almost always) expected Blackboard to be an effective tool in used in their jobs.

Instrumentality (Questions 10 through 17)

The next eight questions asked about the probability of each event occurring as a result of Blackboard use.

Table 4.9*: Getting an incentive pay or raise*

Not likely at all	Somewhat likely	50/50 chance	Quite likely	Extremely likely
93.1% (94)	4.9% (5)	0.0% (0)	1.0% (1)	1.0% (1)

Data showed that 98% or 99 faculty members thought the probability of getting an incentive pay from Blackboard use is not likely or somewhat likely.

Table 4.10*: Having more opportunities for a promotion*

Not likely at all	Somewhat likely	50/50 chance	Quite likely	Extremely likely
92.1% (93)	5.9% (6)	0.0% (0)	1.0% (1)	1.0% (1)

The likelihood of getting a promotion from Blackboard use was low. 98% or 99 faculty members selected not likely at all or somewhat likely that this could happen.

Table 4.11*: Getting better ratings on my student evaluations*

Not likely at all	**Somewhat likely**	50/50 chance	Quite likely	Extremely likely
25.7% (26)	**35.7% (36)**	23.8% (24)	12.9% (13)	1.9% (2)

Only 38.6 % or 39 people with answers ranging from 50/50 to extremely likely, believed that it is possible to get better ratings on student evaluations might get better ratings just because they use Blackboard to teach their courses.

Table 4.12*: Improving my reputation among colleagues and department chairs*

Not likely at all	Somewhat likely	50/50 chance	Quite likely	Extremely likely
70.3% (71)	21.8% (22)	5.9% (6)	1.0% (1)	1.0% (1)

The chances of improving faculty reputation as a result of Blackboard use were not likely. 92.1% or 93 participants viewed that it was not likely at all or somewhat likely to happen.

Table: 4.13*: Having more control over my job by using the time I save on other professorial activities.*

Not likely at all	**Somewhat likely**	50/50 chance	Quite likely	Extremely likely
27.7% (28)	**35.6% (36)**	17.8% (18)	15.8% (16)	3.0% (3)

Only 36.6% or 37 participants with responses ranging from 50/50 chance to extremely likely thought that Blackboard give them more job control.

Table 4.14*: Having a feeling of accomplishment*

Not likely at all	Somewhat likely	50/50 chance	Quite likely	Extremely likely
41.6% (42)	35.7% (36)	10.9% (11)	7.9% (8)	3.9% (4)

The data collected indicated that the probability of having a feeling of accomplishment from Blackboard use was really low, 77.3% or 78 people selected answers from not likely at all to somewhat likely to this question.

Table 4.15*: Having a better reputation among students*

Not likely at all	**Somewhat likely**	50/50 chance	Quite likely	Extremely likely
21.8% (22)	**37.7% (38)**	22.8% (23)	15.8% (16)	1.9% (2)

Sixty faculty members or 59.5% chose answers from not likely at all to somewhat likely to show that the probability or having better reputation among students because of Blackboard use was low.

Table 4.16*: Overall, my department values the use of this course management tool*

Not likely at all	**Somewhat likely**	50/50 chance	Quite likely	Extremely likely
22.8% (23)	**33.7% (34)**	25.7% (26)	13.9% (14)	3.9% (4)

Data from this question showed personal subjective beliefs of faculty and if they thought that their department valued their use of Blackboard. 56.5% of the responses (not likely at all-somewhat likely) showed that there was a small probability of that the statement being true.

Valence (Questions 18- 25)

In the next section, eight questions related to valence were included. Participants were asked to rate the importance of each outcome.

Table 4.17*: Getting an incentive pay or raise*

Less important	Moderately important	**Important**	**Quite important**	Very important
22.7% (23)	7.9% (8)	**24.8% (25)**	**24.8% (25)**	19.8% (20)

Faculty member with answers between important to very important added to 69.4 % or 70 respondents, who viewed monetary incentives as important to them.

Table 4.18*: Having more opportunities for promotion*

Less important	Moderately important	Important	Quite important	Very important
26.7% (27)	11.9% (12)	16.8% (17)	21.8% (22)	22.8% (23)

Data showed that 61.4% or 62 people selected answers from important to very important.

Table 4.19*: Getting better ratings on my student evaluations*

Less important	Moderately important	**Important**	Quite important	Very important
11.9% (12)	10.9% (11)	**29.7% (30)**	28.7% (29)	18.8% (19)

Faculty thought it was important to have better ratings from student evaluations, 77.2% (78 people) of responses were in the range of important to very important.

Table 4.20*: Improve my reputation among colleagues and department chairs*

Less important	Moderately important	**Important**	Quite important	Very important
20.8% (21)	11.9% (12)	**32.6% (33)**	22.8% (23)	11.9% (12)

Reputation was viewed as important; 67.4% (68 people) of responses ranging from important to quite important were selected by participants.

Table 4.21*: Having more control over my job by using the time I save on other professorial activities*

Less important	Moderately important	Important	**Quite important**	Very important
7.9% (8)	10.9% (11)	17.8% (18)	**34.7% (35)**	28.7% (29)

Most of the participants indicated that they cared about more job control and using their free time on other activities. 81.2% of the responses were in the range of important to very important.

Table 4.22*: Having a feeling of accomplishment*

Less important	Moderately important	**Important**	Quite important	Very important
17.8% (18)	13.9% (14)	**35.6% (36)**	13.9% (14)	18.8% (19)

Sixty nine faculty members or 68.3 percent chose answers from important to very important, showing that care about having a feeling of accomplishment.

Table 4.23*: Having a better reputation among students*

Less important	Moderately important	**Important**	Quite important	Very important
9.9% (10)	7.9% (8)	**42.5% (43)**	24.8% (25)	14.9% (15)

Answers from important to very important were chosen by 82.3% of faculty or 83 people.

Table 4.24*: It is important that my department wants to use this course management tool*

Less important	**Moderately important**	Important	Quite important	Very important
27.8% (28)	**39.6% (40)**	24.8% (25)	5.9% (6)	1.9% (2)

Sixty eight people or 67.4% or selected answers ranging from less important to moderately important, showing that there were less interested in what their department wants.

Section 3: Blackboard experience

In this section of the survey, 2 questions were included to evaluate user experience with Blackboard.

Table 4.25*: To what extent did you make an effort to use Blackboard in the past?*

Very low	Low	Moderate	**High**	Extremely high
4.9% (5)	8.9% (9)	24.8% (25)	**33.7% (34)**	27.8% (28)

Sixty two people or 61.4% indicated that their level effort was from moderate to extremely high when they used Blackboard in the past. The high level of effort was the dominant answer.

Table 4.26*: Please rate the present level of effort using Blackboard*

Very low	Low	**Moderate**	High	Extremely high
8.9% (9)	6.9% (7)	**49.5% (50)**	21.8% (22)	12.9% (13)

Even if the level of effort from moderate to extremely high accounted for 84.7% of the responses, the number of moderate effort is predominant in this category.

Section 4: Satisfaction using Blackboard

Two questions to assess the level of user satisfaction were included in this section.

Table 4.27*: I like Blackboard because it is easy to use*

Not at all	Not very	Neutral	**Somewhat**	Very much
5.9% (6)	12.9% (13)	32.7% (33)	**36.6% (37)**	11.9% (12)

Users agreed (48.5 %) that they like Blackboard because it was simple to use. Some (18.8%) did not agree with this statement.

Table 4.28*: Overall, I had a good experience while using Blackboard*

Not at all	Not very	Neutral	**Somewhat**	Very much
5.0% (5)	6.9% (7)	28.7% (29)	**46.5% (47)**	12.9% (13)

Participants (59.4%) with answers within the range somewhat to very much, reported that they had a good experience while using Blackboard.

Section 5: Motivation to use Blackboard tools

In this section, questions assessed the level of motivation with 9 Blackboard tools.

Table 4.29*: Motivation associated with Blackboard tools when planning courses*

	Not at all	Not very	Neutral	Somewhat	Very much
BB Course assignments	13.9% (14)	6.9% (7)	4.9% (5)	30.7% (31)	**43.6% (44)**
BB Grade book	19.9% (20)	5.9% (6)	2.9% (3)	15.9% (16)	**55.4% (56)**
BB Discussion board	25.7% (26)	21.8% (22)	7.9% (8)	**27.8% (28)**	16.8% (17)
BB Email	16.9% (17)	3.9% (4)	1.9% (2)	21.9% (22)	**55.4% (56)**
BB File exchange	23.8% (24)	14.9% (15)	15.8% (16)	**30.6% (31)**	14.9% (15)
BB E-reserves	**37.6% (38)**	14.9% (15)	18.8% (19)	22.8% (23)	5.9% (6)
BB Virtual Classroom	**48.6% (49)**	22.8% (23)	21.8% (22)	5.9% (6)	0.9% (1)

Table 4.29 continued

	Not at all	Not very	Neutral	Somewhat	Very much
BB Calendar	**48.6% (49)**	19.9% (20)	23.7% (24)	6.9% (7)	0.9% (1)
BB Adaptive release	**49.5% (50)**	14.8% (15)	26.7% (27)	4.9.0% (5)	3.9% (4)

The table 4.29 shows how motivated faculty members were to use the 9 tools from Blackboard. Based on the responses most liked tools were (somewhat-very much): Email (77.3%), Course Assignment (74.3%), Gradebook (71.3%). Among the least favorite tools were (not at all-not very): Virtual Classroom (71.4%), Calendar (68.5) and Adaptive release (64.3%).

Section 6: Intentions

The questions in this section measured faculty intentions about Blackboard.

Table 4.30*: Overall, how likely are you to use Blackboard in the next semester?*

Not likely at all	Somewhat unlikely	50/50 chance	Quite likely	**Extremely likely**
13.9% (14)	2.9% (3)	4.9% (5)	30.7% (31)	**47.6% (48)**

Faculty members, specifically 78.2% of them indicated that they were likely to use Blackboard in the next semester (responses from 50/50 chance to extremely likely).

Table 4.31*: Based on your current satisfaction with Blackboard, if you had to buy it for your teaching activities, how much would you pay for its license?*

$0-100	$100-200	$200-300	$400-500	$500+
73.4% (74)	17.9% (18)	4.9% (5)	1.9% (2)	1.9% (2)

Price is a good indicator of the satisfaction level, 73.3% indicated that they would pay up to one hundred US dollars to use this course management system. The other 26.6% would pay from one hundred US dollars and above.

Table 4.32: *Based on your satisfaction with Blackboard, how likely are you to recommend it to your colleagues?*

Not likely at all	Somewhat unlikely	50/50 chance	**Quite likely**	Extremely likely
9.9% (10)	8.9% (9)	34.7% (35)	**38.6% (39)**	7.9% (8)

Data indicated that 81.2% of the respondents (50/50 chance to extremely likely) would recommend Blackboard to their colleagues.

Section 7: Demographics and classification for Blackboard users

These questions collected information about 101 participants that used Blackboard.

Question 1: What is your gender?

Male 45.5% (46), Female 54.5% (55)

There were more female users of Blackboard as it could be seen from the results.

Table 4.33*: What is your age?*

Age	Percentage (number of responses)
<27	1% (1)
28-44	**40.6% (41)**
45-54	36.6% (37)
55-64	19.80%(20)
65+	2%(2)

The dominant age group of Blackboard users was between the age of 28 and 44 with 77.2% of respondents.

Table 4.34*: How many years have you been teaching in higher education institutions?*

Years	Percentage (Number of responses)
1-5	16.8%(17)
6-10	21.8% (22)
11-15	**22.8%(23)**
16-20	17.8% (18)
20+	20.8%(21)

People with 6-10, 11-15 and those with more than 20 years were among the top users of Blackboard, a total of 65.4%.

Table 4.35*: Which of the following best describes your specialization area?*

Area	Percentage (Number of responses)
Business	23.8%(24)
Arts	9.9% (10)
Sciences	**27.7% (28)**
Education	16.8% (17)
Health	14.9% (15)
Engineering (sciences)	6.9% (7)

Faculty members in the departments of science and business were the majority of Blackboard users (58.4%). Arts and health had the lowest number of users.

Table 4.36*: What is your faculty rank?*

Faculty rank	Percentage (Number of responses)
Instructor/Lecturer	5.9% (6)
Assistant Professor	**41.6% (42)**
Associate Professor	25.7% (26)
Professor	26.7% (27)

Based on the results, most of the users of Blackboard were among Assistant professors (41.6%).

Table 4.37*: What was your tenure status at your present institution during the past term?*

Tenure	Percentage (Number of responses)
No tenure system	0% (0)
Non-tenure track	11.9% (12)
Tenure-track	**44.6% (45)**
Tenured	43.6%(44)

Faculty on tenure track had the lead in using Blackboard, followed by tenured professors.

Section 8: Demographics and classification for Blackboard non-users

This part of the survey collected information about those participants that did not use Blackboard in their teaching activities. Twenty participants in the survey reported being non-users of Blackboard for several reasons. The participants could select the options provided below or fill out the "other" answer with their specific reason. Most of the non-users (65%) or 13 participants indicated that they could do without Blackboard in their teaching. Fifteen percent indicated that they do not use Blackboard due to lack of time. The faculty that did not know about Blackboard's existence and that gave up because it is complicated to use got 10% for each category. Among other option, the predominant answer was that participants were using an alternative CMS.

Table 4.38*: Why have you not used Blackboard for your classroom instruction?*

Response Options	Percentage (number of responses)
I did not know about its existence	10% (2)
I do not have time to use it	15 %(3)
It was too complicated to use and I gave up	10%(2)
I can do without it	**65% (13)**
I dread technology	0% (0)
Other	
	1.We use a different system
	2.We switched to a different course management system
	3.Our institution does not provide Blackboard
	4.Using a different CMS
	5.Blackboard is not offered
	6.I use Sakai
	7. My university is switching to Sakai for its CMS, and I am using it instead.
	8.We use Moodle

Qualitative analysis of twenty non-users of Blackboard

Question 2: What is your gender?

Male 60% (12), Female 40% (8)

From the data set, there were more male non-users compared to female non-users.

Table 4.39*: What is your age?*

Age	Percentage (number of responses)
<27	0% (0)
28-44	25% (5)
45-54	**50% (10)**
55-64	25% (5)
65+	0% (0)

Half of the non-users were between the ages of 45 to54. The results show that there were no people younger than 27 or older than 65 that did not use Blackboard. The other two groups each had 25% of responses or 5 people in each category.

Table 4.40: *How many years have you been teaching in higher education institutions?*

Age	Percentage (number of responses)
1-5	10% (2)
6-10	20%(4)
11-15	**30% (6)**
16-20	**30% (6)**
20+	10%(2)

Sixty percent of non-users fell into the groups between 11 and 20 years of teaching experience.

Table 4.41: *Which of the following best describes your specialization area?*

Area	Percentage (number of responses)
Business	10% (2)
Arts	10% (2)
Sciences	20% (4)
Education	**35% (7)**
Health	10% (2)
Engineering (sciences)	15% (3)

Most of non-users came from the departments of Science and Education, with 35% each or 70% total.

Table 4.42: *What is your faculty rank?*

Rank	Percentage (number of responses)
Instructor/Lecturer	5% (1)
Assistant Professor	35% (7)
Associate Professor	20% (4)
Professor	**40% (8)**

Professors and assistant professors were 75% of non-users.

Table 4.43*: What was your tenure status at your present institution during the past term?*

Tenure	Percentage (number of responses)
No tenure system	5%(1)
Non-tenure track	25% (5)
Tenure-track	15% (3)
Tenured	**55% (11)**

Fifty five percent of tenured faculty was not using Blackboard in their courses.

Statistical Analysis

The following is the summary of statistical analysis for each of the research questions.

Data Analysis for Research Question No. 1

Research question 1: Does the VIE model predict faculty motivation to use Blackboard?

Hypothesis 1: There is a relationship between a faculty member's motivation to use Blackboard tools and the Elements of VIE theory.

The level of significance used in this study was 0.05. The assumption was made that there was a linear relationship between the elements of VIE (Expectancy, Instrumentality and Valence) and motivation to use Blackboard tools. Statistically the relationship was expressed using the following formula:

$$Motivation\ to\ use\ BB\ tools = B_0 + Eb1 + Ib2 + Vb3$$

Where, E is expectancy, I is instrumentality and V is validity, and b1, b2, b3 are the regression coefficients and B_0 is Y-intercept of the line. The analysis was able to test if the independent variables (Expectancy, Instrumentality and Valence) predicted the dependent variable (Faculty Motivation).

Assessment of the Regression Model

Before proceeding to a full scale data analysis, it was essential to assess the regression model by looking if the model a good fit for the data that is being analyzed. This means observing if the model has been affected by a small number of influential cases.

Outliers and Influential Cases

The assessment of outliers was performed by using the value of standardized residuals as a guideline. The SPSS output revealed that there were 3 cases with standardized residuals outside an absolute value 2. None of the cases were outside an absolute value 3.0. According to Field (2000), in a normally distributed sample, 95% of standardized residuals should have an absolute value of 2, and 99% of standardized residuals should have an absolute value of 3. Any standardized residual with an absolute value greater than 3 is a cause for concern. In this data set, with a sample of 101 cases, it is reasonable to expect about 5 cases (5%) to have standardized residuals outside of absolute value 2. The output revealed only 3 cases, therefore, it is reasonable to consider the regression model as a good representation of the sample data.

The assessment of influential cases was performed by examining Cook's distance, which usually indicates the overall influence of a case on a model. Cook's distance revealed values below 1, which implies that there was no concern about some cases having excessive influence on the parameter of the model.

Examinations of Assumptions

To ensure a regression equation with unbiased estimates of parameters, all assumptions must be met. Some assumptions can be checked directly against the result of descriptive statistics while others need further statistical testing to verify. Variables in the model met the assumption of being quantitative and continuous.

The assumptions of the non-zero variance in predictors were met. The variances for the predictors were 1.15 (Valence), 0.42 (Expectancy), 0.39 (Instrumentality). As mentioned before, each value of the outcome variable came from a separate subject, so the assumption of independence of values among subjects was met. An examination of the assumptions such as multicollinearity between predictors, homoscedasticity, linearity, and normally distributed errors was conducted.

"VIF" values for each predictor also check for multicollinearity. The VIF, which stands for *variance inflation factor*. Usually, a VIF value greater than 10 may merit further investigation. Multicollinearity is not a problem for this model; all variables have a VIF below 10.

A graph of standardized residuals was plotted against standardizes predicted values, showing the homoscedasticity of the values.

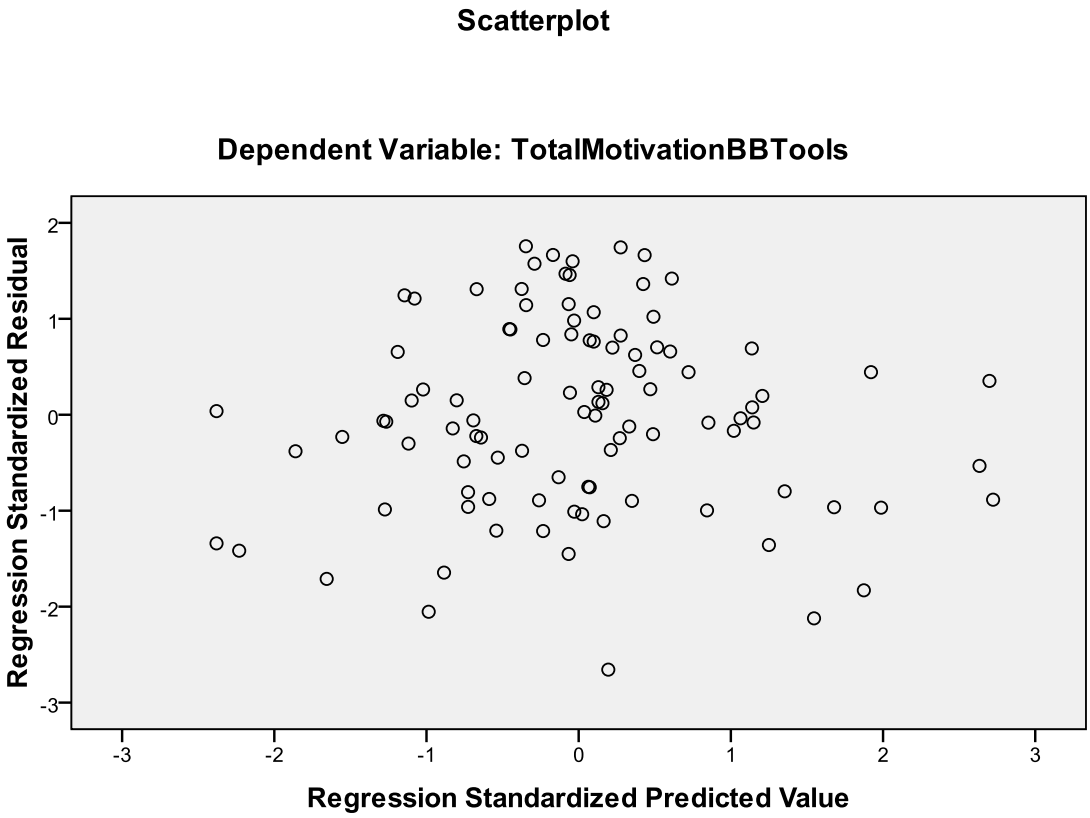


Figure 4.1: The graph of standardized residuals (*ZRESID) against regression standardized predicted value (*ZPRED).

In this model the assumption has been met because the points are randomly and evenly dispersed throughout the plot. The assumption of normally distributed errors means that the differences between the model and the observed data are most frequently zero, or close to zero, and that a difference much greater than zero would be rare.

This assumption can be examined through the Normal P-P plot of regression standardized residual. In this case the assumption had been met because most of all the observed residuals, represented by the points, lie on the straight line which represents a normal distribution. Firgure 4.2 illustrates how residuals fall around the line

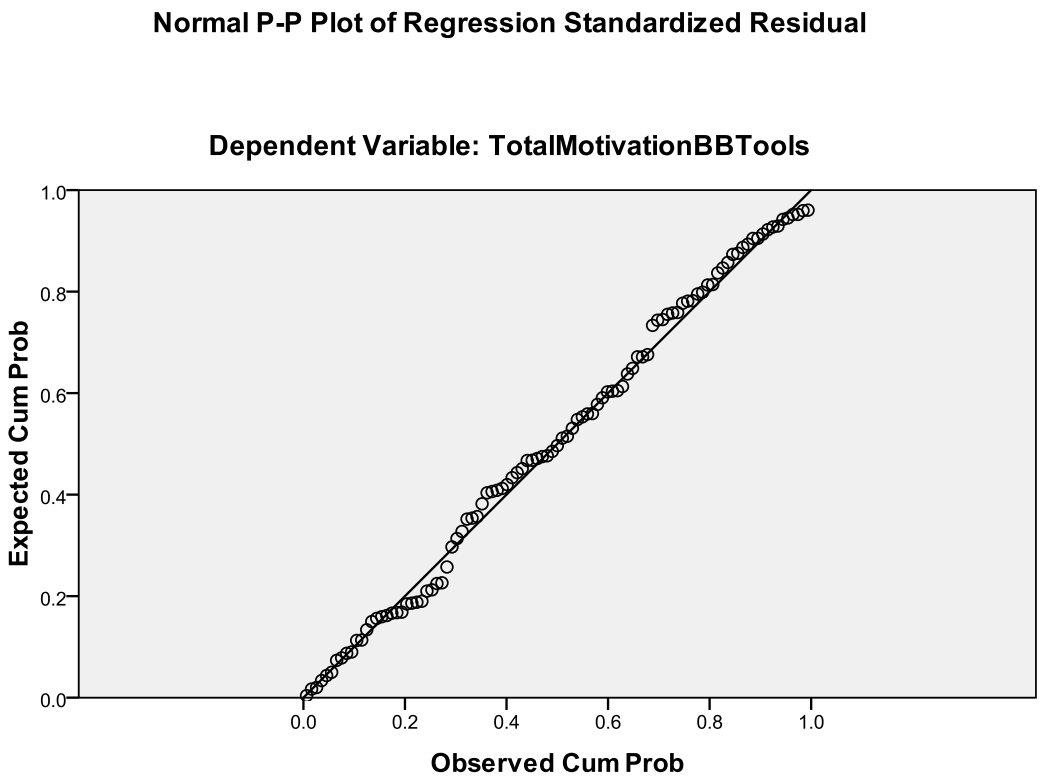


Figure 4.2: Normal distribution of the regression standardized residuals.

Descriptive statistics

Table 4.44 summarizes the mean, variance and standard deviations of the variables used to answer research question number one.

Table 4.44: *Descriptive statistics for dependent and independent variables*

Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation	Variance
TotalMotivBBTools	101	1.00	4.22	2.8548	.80488	.648
TotalValence	101	1.00	5.00	3.1881	1.07227	1.150
TotalInstrumentality	101	1.00	4.71	1.8020	.62759	.394
TotalExpectancy	101	1.57	4.71	3.1103	.65118	.424

The correlation matrix in Table 4.45 showed the strength of the relationships between the predictors and the criterion variable, as well as the relationship between each of the predictors. The values of Pearson correlations (as presented in the Correlations) show the relationships between each pair of independent variables.

The results show strong correlations but not significant relationships ($r < 0.5$).

Table 4.45: *Pearson Correlation matrix between independent and dependant variables*

		TotalMotivBBTools	TotalExpectancy	TotalInstrumentality	TotalValence
Pearson Correlation	TotalMotivBBTools	1.000	.408	.355	.237
	TotalExpectancy	.408	1.000	.574	.128
	TotalInstrumentality	.355	.574	1.000	.281
	TotalValence	.237	.128	.281	1.000
Sig. (1-tailed)	TotalMotivBBTools	.	.000	.000	.008
	TotalExpectancy	.000	.	.000	.100
	TotalInstrumentality	.000	.000	.	.002
	TotalValence	.008	.100	.002	.

Of all the predictors, Total Expectancy had the highest correlation with Total Motivation to use BB tools, criterion variable (r = .408), followed by Total Instrumentality (r = .355), and then Total Valence (r = .237). The correlation matrix shows that the three independent variables (Expectancy, Instrumentality and Valence) each had a positive relationship with the criterion or dependent variable. The relationship is not significant but it does exist.

Model summary

The coefficient of determination, represented by R^2 was 0.212. R^2 is the proportion of variability in the dependent variable that can be predicted from the independent variables. The R^2 value indicated that the linear combination of all the

independent variables accounted for approximately 21.2% of the variability of the motivation to use Blackboard. The *shrinkage*, or loss of predictive power when the model is used in another sample, can be examined through the adjusted R^2 generated by SPSS. In this case, the R^2adj was 0.188, which is about 12 % difference from the value of R^2. Data on these coefficients in presented in Table 4.46.

Table 4.46: *Correlation coefficients*

Model Summary[b]

Model	R Square	Adjusted R Square	Std. Error of the Estimate
1	.212	.188	.72538

a. Predictors: (Constant), TotalValence, TotalInstrumentality, TotalExpectancy

b. Dependent Variable: TotalMotivationBBTools

The *F* value tells whether the independent variables reliably predict the dependent variable. In this case, the *F* value is significant, F =8.708, p = .000. Therefore the linear combination of the independent variables can be used to predict the dependent variable, Motivation to use Blackboard tools (TotalMotivationBBTools). Table 4.47 shows the results of the analysis of variances.

Table 4.47: *Analysis of Variance*

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.745	3	4.582	8.708	.000[a]
	Residual	51.039	97	.526		
	Total	64.784	100			

a. Predictors: (Constant), TotalValence, TotalInstrumentality, TotalExpectancy

b. Dependent Variable: TotalMotivationBBTools

Model Parameters

The individual contribution of each predictor to the model can be examined from the estimates of coefficients for the model. Table 4.48 presents the table of coefficients. The *t* value indicated whether a predictor was making significant contribution to the model. In this model, not all predictors were not making a significant contribution, ($r<.5$). However, Total Expectancy had a relatively higher contribution than other two predictors because it had a large t-value. Therefore, Expectancy was considered the most important predictor. Both Valence and Instrumentality had lower t-values and were not significant, p-value>0.05.

The value β (beta) tells the relationship between the criterion variable and each predictor. A positive value implies a positive relationship between the predictor and response factor. Detailed information of the results is presented in Table 4.48.

Table 4.48: *Coefficients of the regression model*

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.967	.395		2.447	.016
	TotalExpectancy	.386	.136	.312	2.836	.006
	TotalInstrumentality	.168	.146	.131	1.149	.253
	TotalValence	.120	.071	.161	1.708	.091

	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
Model	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
(Constant)	.183	1.751					
TotalExpectancy	.116	.657	.408	.277	.256	.669	1.495
TotalInstrumentality	-.122	.458	.355	.116	.104	.626	1.596
TotalValence	-.020	.261	.237	.171	.154	.919	1.088

The relative importance of each predictor can also be examined from part correlations. A part correlation is the unique correlation of each predictor with the criterion variable, partially taking out the effects of all other predictors in the model from the predictor but not the criterion variable. Expectancy had a partial correlation of (.277) with the criterion variable, followed by Valence (.171) and Instrumentality (.116).

Data Analysis for Research Question No. 2

Research question 2: What is the strongest motivational factor that drives faculty to use Blackboard course management tools in facilitating classroom teaching?

To answer this question, a correlation between variable “Intentions” (the answers to Questions 31, 32 and 33 of the questionnaire) and 9 Variables of Motivation to use BB tools (Question 30) was assessed. The “Intentions” variable was selected to be correlated

to the Motivation to use Blackboard tools because it best explains faculty behavior. Motivation is seen as a process that leads to forming of behavioral intentions**.**

Table 4.49: *Pearson Correlation coefficients for Intentions and the elements of Motivation to use BB tools*

N=101		Intentions
Intentions	Pearson Correlation	1
MotCourseAssign	Pearson Correlation	.492**
	Sig. (2-tailed)	.000
MotGradeBook	Pearson Correlation	.463**
	Sig. (2-tailed)	.000
MotDiscussBoard	Pearson Correlation	.152
	Sig. (2-tailed)	.130
MotEmail	Pearson Correlation	.418**
	Sig. (2-tailed)	.000
MotFileXchange	Pearson Correlation	.041
	Sig. (2-tailed)	.681
MotEreserves	Pearson Correlation	.114
	Sig. (2-tailed)	.258
MotVirtualClass	Pearson Correlation	.202*
	Sig. (2-tailed)	.043
MotCalendar	Pearson Correlation	.079
	Sig. (2-tailed)	.430
MotAdaptiveRelease	Pearson Correlation	.171
	Sig. (2-tailed)	.087

From the table 4.49 of Pearson correlations, the strongest correlation of motivation was using Blackboard Course Assignment tool (MotCourseAssign). In the correlation analysis some other tools with a strong correlation of motivation use were: Grade Book and Email. File exchange, Calendar and E-reserves provided the least motivation for faculty.

Data Analysis for Research Question No. 3

Research question 3 stated: Is there a relationship between Valence and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?

Hypothesis 2: Valence is useful in predicting a faculty member's motivation to use Blackboard.

This question could be answered by looking at the output from research question number one. Valence shows a good relationship with the Total Motivation to use BB tools (r=.237) It is significant as an individual variable, but not as a part of the regression model.

From Table 4.48, the *t* value indicated whether a predictor was making a contribution to the model. For this model, Valence had a t value t(101)=1.708 and a p-value >0.05,indicating that it was not making a significant contribution to the model. The β was positive for Valence indicating a positive relationship between the predictor and the criterion variable.

From the results, it could be inferred that even though Valence does not have a significant impact on the model, independently it is useful in the prediction of faculty motivation to use Blackboard.

Data Analysis for Research Question No. 4

Research question 4 stated: Is there a relationship between Instrumentality and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?

Hypothesis 3: Instrumentality is useful in predicting a faculty member's motivation to use Blackboard.

This question could be answered by using the output from research question number one. Instrumentality showed a good relationship with the Total Motivation to use BB tools (r=.355).

From Table 4.48, the *t* value for Instrumentality had a small contribution compared to other two predictors, t (101) =1.149 and was not significant p-value>0.05. The β was positive for valence indicating a positive relationship between the predictor and the response factor.

The results lead to the conclusion that Instrumentality was significant by itself not as a part of the regression model.

Data Analysis for Research Question No. 5

Research question 5 stated: Is there a relationship between Expectancy and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?

Hypothesis 4: Expectancy is useful in predicting a faculty member's motivation to use Blackboard.

The quantitative analysis for this question was done using the output from research question number one. Table 4.45 showed that Expectancy had a strong and significant relationship with the Total Motivation to use BB tools (r=.408).

Table 4.48 showed that Expectancy was making a substantial contribution to the regression model t (101) =2.836, t-value was the highest among the 3 predictors. The β

was positive for valence indicating a positive relationship between the predictor and the response factor. In conclusion, it could be stated that Expectancy showed a strong relationship with the dependent variable, making a significant contribution to the regression model.

Data Analysis for Research Question No. 6

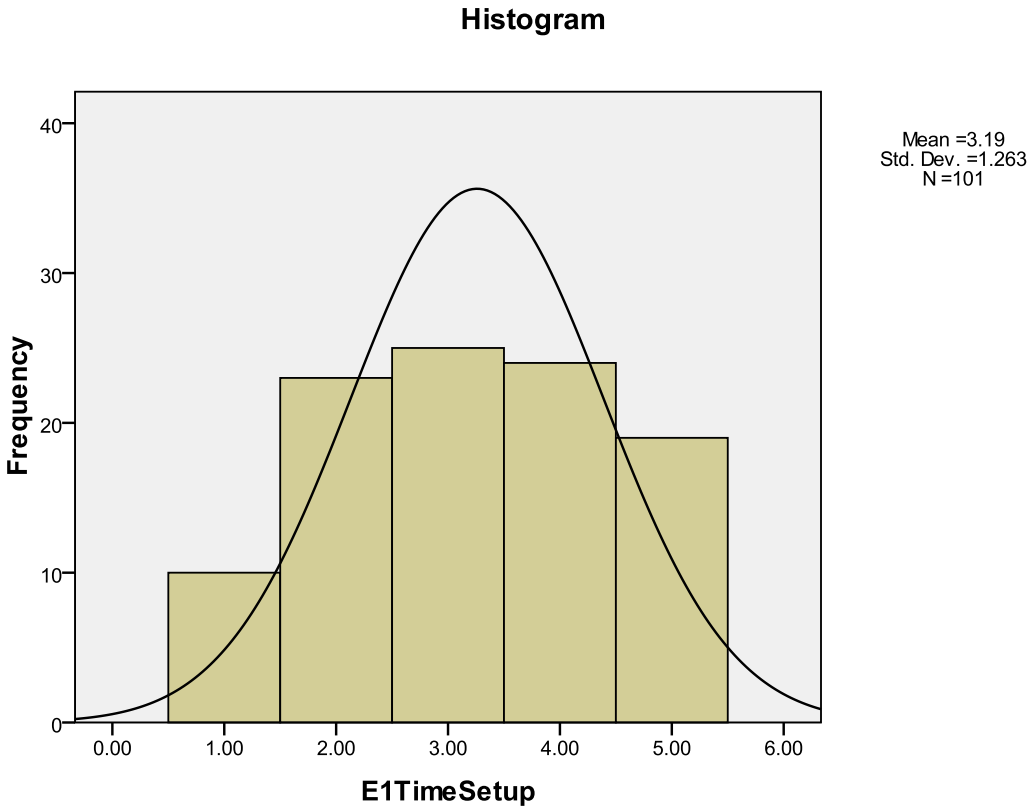
Research question 6 stated: Does faculty perceive using Blackboard course management tools as saving time? The following hypothesis was tested.

Hypothesis 5: A faculty member perceives using Blackboard course management tools as saving time.

The purpose of the data analysis was to identify if using Blackboard is perceived by faculty as saving them time in their teaching activities. The researcher looked at two Expectancy items from the questionnaire related to time (Expectancy E1 and E2). One variable was estimating the time presently required to setup Blackboard and the other was estimating faculty beliefs of future time savings when using Blackboard.

Survey Question 2: Using Blackboard will result in spending more time setting up my courses.

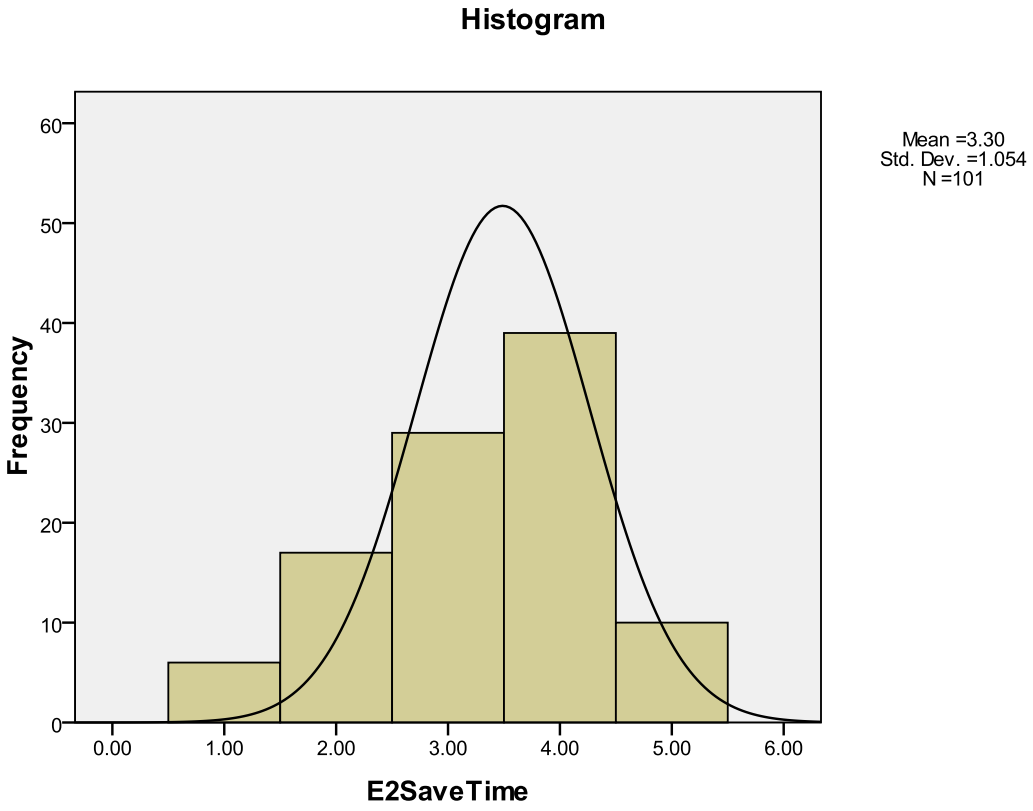
Figure 4.3: Frequency distribution of answers to survey question number 2.



The histogram in figure 2 shows the number of cases per unit of scales so that the height of each bar is equal to the proportion of total people in the survey who fall into that category. The area under the curve represents the total number of cases (N=101)

Survey Question 3: Using Blackboard will allow me, in the long run, to save time for other professorial activities.

Figure 4.4: Frequency distribution of answers to survey question number 3.



The histogram in figure 3 represents the number of cases per unit of scales, each bar indicating the number of people that selected an answer from a scale of one to five. A single tail T-test was used for examining this hypothesis. The researcher compared the mean value of the answers the respondents provided to the mean of scales, which equals to 3 in this study, based on a 5 point Likert scale.

To address survey question number 2: Using Blackboard will result in spending more time setting up my courses, a value greater than 3 would indicate that Blackboard does take more time to setup. The following hypotheses were tested:

Alternative hypothesis: $\mu < 3$

Null Hypothesis: $\mu \geq 3$

One sample t-test was used to compare the mean of the response to this question with the mean of scales.

Table 4.50: *Parameters for variable E1TimeSetup*

	Test Value = 3					
	N	Mean	t	t obs	Sig. (1-tailed)	Mean Difference
E1TimeSetup	101	3.19	1.497	1.658	0.931	.18812

As the Table 4.50 shows, t-value for the perception that it takes more time to setup your courses was 1.497, which is less than t critical value of 1.658.Using the p-value there is insufficient evidence at level of significance 0.05 to conclude that Blackboard saves time based on the time required to setup Blackboard for courses.

The next step involved testing the hypothesis for survey question 3: Blackboard saves time in the long run.

Alternative hypothesis: $\mu > 3$

Null Hypothesis: $\mu \leq 3$

Table 4.51: *Parameters for Variable E2SaveTime*

	Test Value = 3					
	N	Mean	t	t obs	Sig. (1-tailed)	Mean Difference
E1SaveTime	101	3.3	2.832	1.658	.003	.29703

From table 4.51, the t-value for the perception that Blackboard saves time in the long run was 2.832, which is greater than the t critical value of 1.658. Its p-value indicated that there is sufficient evidence, at level of significance of 0.05 to conclude that faculty expects Blackboard to them time in the long run.

Results in Table 4.52, showing Pearson correlations between the two time variables (E1TimeSetup, E2SaveTime) and Intentions show that there is a strong and significant relationship between Intentions and the expectancy that Blackboard will save time in the long run. The correlation between Intentions and the expectancy that Blackboard will require more time to setup the courses was small and not significant, showing faculty perceived that using Blackboard will require more time upfront when setting up instructional courses.

Table 4.52: *Correlations between variables E1TimeSetup, E2SaveTime and Intentions*

		E1TimeSetup	EI2SaveTime	Intentions
E1TimeSetup	Pearson Correlation	1	-0.163	-0.141
	Sig. (2-tailed)		0.104	0.160
E2SaveTime	Pearson Correlation	-0.163	1	0.374**
	Sig. (2-tailed)	0.104		.000

Data Analysis for Research Question No. 7

Research question 7: Is there a relationship between the utilization of course management tools and gender?

Hypothesis 6: There is a relationship between utilization of course management tools and gender.

To analyze this hypothesis the researcher compared the response rate of females and males in both users and non-users of Blackboard. All the data is shown below

Table 4.53: *Gender and Blackboard usage demographic data*

Gender	BB Users	BB Non-users
Male	45.5%	60%
Female	54.5%	40%

To analyze the relationship between usage of Blackboard and gender, a test for Chi square statistic was used between gender and usage for both users and non-users of

Blackboard. Chi-square statistic is usually used to determine if there is a significant relationship between two categorical variables.

The results From Table 4.54 indicate that there was no statistically significant relationship between the usage of Blackboard and gender (chi-square with one degree of freedom = 2.529, p = 0.112), such that women were not more likely to use Blackboard than men.

Table 4.54: *Chi square analysis between gender and Blackboard usage*

gender * BBUsage Crosstabulation

		BBUsage		Total
		No	Yes	
gender	female	7	55	62
	male	13	46	59
Total		20	101	121

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.529[a]	1	.112		
Continuity Correction[b]	1.810	1	.178		
Likelihood Ratio	2.557	1	.110		
Fisher's Exact Test				.144	.089
Linear-by-Linear Association	2.508	1	.113		
N of Valid Cases	121				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.75.

Summary

Chapter four provided a detailed analysis of the data collected through the research instrument. Quantitative and qualitative analyses were conduced to help address the 7 research hypothesis mentioned in Chapter one. The quantitative analyses found that expectancy had a strong and significant relationship and with faculty motivation to use Blackboard tools and as part of the regression model. Even if Valence and Instrumentality were significant by themselves, these variables were not significant as part of the regression model. Qualitative analysis showed that the difference between male users and female users was not significant to conclude that one group was more likely to use Blackboard.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

Introduction

Today new technologies are changing how instructional materials are being delivered. It is really surprising that course management systems have been adopted at a high rate by institutions of higher education that typically are known for holding onto traditional methods of teaching (West, Waddoups, Kennedy, and Graham, 2006).

These systems were initially designed to support distance education, but today they are being used to compliment traditional campus based classroom courses. All of the major universities tend to have a course management system, even though they tend to have a complex nature (Coates, James & Baldwin, 2005). Initiation, maintenance and support of these systems require a great investment of financial resources, time and technical expertise of support staff. It is crucial to recognize faculty's expectations and their attitudes toward the use of course management systems to enhance learning and teaching methodologies. Accepting a technology depends on whether faculty members believe that the technology will benefit them.

This study was undertaken to analyze if Vroom's Expectancy theory predicts the process of motivation that takes place among faculty members when they use a course management system. Blackboard is one of the most commonly used commercial Learning/Course Management Systems globally (Chang, 2008). Due to its familiarity and wide spread use, Blackboard was chosen to conduct this research.

Seeing what motivates faculty is important because it provides valuable information to university administrators who decide what course management systems to use and what resources to allocate. Software developers could use this information to decide how to better design the interface of a course management system and what specific tools to create.

Several questions guided this study. The first five research questions investigated the relationship between the elements of the Expectancy theory (Valence, Instrumentality and Expectancy) and the process of motivation when using Blackboard tools during teaching activities. To be more specific, nine tools used in Blackboard were selected based on previous research about the most useful and least useful features of Blackboard (Colorado & Butler, 2007). The researcher analyzed the data to see which elements of the VIE model, if any, had a significant influence on motivation to use those tools.

The next question focused on the relationship between the use of a course management system and time. The analysis focused around the issue of saving time while using Blackboard. The last research question was designed to investigate if gender is related in any way with the use of a course management system.

A survey questionnaire was used to answer these research questions. Several scales were used to collect qualitative and quantitative data, among them: a five point Likert scale, check-all-that apply and several open-ended questions.

The survey was placed on a web site and sent to 448 faculty members with two follow ups. Data collected rendered 121 responses, obtaining a response rate of 27

percent. From those that participated in this survey, 101 faculty members indicated that had previously used Blackboard and twenty had not. Among those that had not used Blackboard before, two respondents stated that they did not know about Blackboard's existence. The rest of the respondents had different reasons for not using it, 83% of them stated that they could do without Blackboard in their instructional process.

To answer the research questions data from 101 respondents was used. This data set was analyzed using SPSS version 17. Multiple regressions have been used to analyze the responses and to understand how the elements of VIE theory interact with faculty motivation to use Blackboard. A separate qualitative analysis was done for the twenty non-users of Blackboard.

Conclusions

This study aimed to examine if Expectancy theory can predict faculty motivation to use a course management system. Qualitative and quantitative methods of analysis were used. Seven research questions and six hypotheses were tested and analyzed.

Quantitative Conclusions

Research question 1 asked: Does the VIE model predict faculty motivation to use Blackboard?

The value of the coefficient of determination (R^2) indicated that the linear combination of all the independent variables accounted for approximately 21.2% of the variability of the motivation to use Blackboard, showing that the variables tend to

increase or decrease together. The results show that all the three independent variables each had a positive relationship with the outcome variable. The value of the coefficient of determination was not high, $R^2 = 0.212$, but it showed that there is a good fit between the variables. The Analysis of Variance showed that the F value was significant F =8.708, p <0.05, and that the combination of the independent variables could be used to predict the dependent variable. The individual contribution of each predictor was examined from the estimates of the coefficient for the model. In this model not all of the variables were significant. Based on the p-values, which were greater than 0.05, Valence and Instrumentality were not making a significant contribution.

Research question 2 asked: What is the strongest motivational factor that drives faculty to use course management tools in facilitating classroom teaching?

The analysis for this question involved using Pearson's correlation matrix between variable Intentions and nine variables of Motivation to use Blackboard tools. The results revealed that Motivation to use the Course Assignment tool had the strongest relationship with Intentions, r=0.492, followed by the Motivation to use Grade Book r=0.463 and Motivation to use Email tool in Blackboard, r=0.418. This was consistent with the findings of Woods, Bakerb and Hoope (2004) that showed that Blackboard was primary used for distribution of course materials to students and posting grades. Based on the value of the correlation coefficients, File exchange, Calendar and E-reserves provided the least motivation for faculty to use Blackboard.

Research question 3 asked: Is there a relationship between Valence and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?

The output from question one was used to answer this question. Valence had a good correlation with the Motivation to use Blackboard tools (r=0.237), but for this model, Valence had a t value t(101)=1.708 and its p-value was greater than 0.05,indicating that it was not making a significant contribution to the model

Research question 4 asked: Is there a relationship between Instrumentality and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?

Instrumentality showed a good correlation with the Motivation to use Blackboard tools, a value of r=0.355, which was higher than Valence. The contribution of this variable based on its t-value, t(101)=1.149, was small and not signification, p-value was greater than 0.05.

Research question 5 asked: Is there a relationship between Expectancy and a faculty member's motivation to use Blackboard tools for facilitating classroom teaching?

Expectancy had the strongest relationship with the Motivation to use Blackboard tools; the value of the correlation coefficient was =0.408. It was also significant, its p-value was smaller than 0.05. Expectancy was also making a significant contribution to the model based on its t-value, t (101) =2.836, it had the highest value among the 3 predictors.

Research question 6 asked: Does a faculty member perceive using Blackboard course management tools as saving time?

Two time variables derived from survey questions number 2 and 3 were used for this analysis. One question asked if faculty members believed that using Blackboard will result in spending more time setting up their courses and the next question was asking if using Blackboard will allow them to save time in the long run, the time that they could use on other professorial activities. The hypothesis was tested comparing the mean of scales to the mean of the responses to this question.

Using Variable E1 Time required to setup Blackboard the hypothesis was tested using one sample t-test, the results revealed that the p-value was larger than 0.05, providing insufficient evidence to conclude that Blackboard saves time based on time required to setup courses.

The second time variable, E2 Blackboard saves time in the long run, was tested the same way as E1, its p-value was smaller than 0.05, providing sufficient evidence to conclude that Blackboard does save time in the long run. The correlation matrix between these two time variables and intentions showed that Time to setup had negative relationship with intentions and the correlation to Time that BB saves in the long run was positive and significant.

Research question number 7 asked: Is there a relationship between utilization of course management tools and gender?

To analyze this relationship a Chi-square test was used. The responses from 121 participants, both users and non-users of Blackboard were used. Even though the qualitative results revealed that more women used Blackboard, the results of Chi square analysis, $\chi^2 = 2.529$, $p > 0.05$, indicated that the relationship is not statistically significant to conclude that women were more likely to use Blackboard than men.

Qualitative conclusions

A survey questionnaire was used to collect the necessary data from the participants. The results of the survey revealed that from 121 participants in this survey 83.5percent have used Blackboard before. From 101 participants that have used Blackboard before, the vast majority 71.3 percent have taught more than five classes using Blackboard. Based on the familiar concept that typically males are more interested in technology, the results of this study demonstrated quite the opposite; according to this survey 54 percent of users were female. Among non users of Blackboard males accounted for the greatest number, 60 percent. The predominant age group that used Blackboard was between 28-41 years old, accounting 40.6 percent of users followed by the group of 45-54 years old, with 36.6 percent. The difference was small and according to current research, technology use is becoming age neutral (Stroud, 2009), even if before people thought that younger generations tend to use technology more. Skelly(2009) pointed out that even though people in their twenties are seen as tech savvy, those between the ages of 45-54 are becoming more comfortable with the technological tools. On the other hand, non-users were predominantly in the same age group of 45-54 with 50 percent, followed by 28-44 and 55-64 years of age with both 25 percent.

Faculty members with 11-15 years of teaching experience in higher education institutions accounted for 22.8 percent of the users of Blackboard, followed by those with more than 20 years of experience with 20.8 percent. The majority of non-users fell into the category of 11-15 and 16-20 and years of experience, with 30 percent each. Most of the Blackboard users came from Sciences with 27.7 percent; non-users were mostly in the areas of Education with 35 percent. The predominant faculty rank among users of Blackboard was Assistant Professor with 41.6 percent, among non-users Assistant Professors were the dominant group with 35 percent. Most of the users of Blackboard, 44.6 percent, were on tenure track positions, followed by tenured professors with 43.6 percent. Most of non-users of Blackboard fell in the category of tenured professors.

The question related to reasons for not using Blackboard revealed some interesting results. Before the data collection, the researcher believed that most of the participants that did not use Blackboard would choose: "I do not have time to use it." However, that choice accounted for only 25 percent of the responses. The vast majority, 83.3 percent, chose "I can do without Blackboard". The answer options "I did not know about Blackboard's existence" and "It was too complicated and I gave up" both had 16.7 percent of the answers. None of the respondents selected the answer "I dread technology." This was a good indication that among the participants in the survey, there were no people that resisted using technology and that more faculty members are feeling comfortable with technology in their instruction.

Some participants were kind enough to leave their own comments about reasons for not using Blackboard. Most of the answers showed that their institution was in the process of switching from Blackboard, which is a commercial course management system, to an open source course management system, such as Moodle or Sakai. There could be several reasons for that change. One could be financial, because commercial course management systems require license fees to be paid to the company that develops and maintains these systems and these days universities have less financial resources available to be spent on such programs. Another reason might be the open source systems might better meet the needs of instructors and students compared the commercial ones. These CMSs allow more personalization and focus on more on teaching activities than administrative options. According to <www.4moodle.com> ,which is a Dutch portal, Moodle's advantages over Blackboard include: easier to maneuver, less area monopolized for navigation, easier to incorporate multimedia elements, more useful tools available (like journal, glossary, poll, etc), track student activity to see which parts of the course are preferred, quiz tools provide scores and details on the student's use, could be customized to add desired features, features are robust, surveys allow as few as 2 choices.

Expectancy theory and Blackboard use conclusions

In this study, faculty motivation was measured according to the postulates of Vroom's Expectancy theory. Before the actual data collection and analysis, the anticipation was that Valence would be the most important predictor of faculty motivation to use Blackboard. The main reason for this assumption was that faculty

might see the list of suggested outcomes very desirable and rewarding for their performance. Even thought Valence did not have a significant influence in this model. The most preferred outcomes ranked by faculty were:

1) Having a course management system that gives faculty more job control and saves them time for other activities.
2) Getting better rating on their student evaluations.
3) Having better reputation among students.
4) Getting an incentive pay or raise, universities have not established a strong connection between getting monetary incentives and active use of a course management system.
5) Having opportunities for promotion and having a feeling of accomplishment had the same importance.
6) Faculty was least interested in improving their reputation among colleagues and department chairs.

Administrators could ask teachers more about the list of possible outcomes, rewards for a high performance that they desire from the use of a course management system. Even though rewards and outcomes tend to be very subjective, using the results of this study could help the administration see what motivates faculty members to use Blackboard. Even if monetary rewards are not always possible, other rewards could be used.

Instrumentality has to do with the belief that if certain actions were completed it could lead to a specific outcome. Among seven instrumentalities related to beliefs about Blackboard, faculty ranked them as follows:

1) Having better reputation among students.
2) Having a course management system that gives faculty more job control and saves them time for other activities.
3) Getting better ratings on student evaluations.
4) Having a feeling of accomplishment.
5) Improving their reputation among colleagues and department chairs.
6) Having opportunities for promotion.
7) Getting an incentive pay or raise.

University administration, having control over certain extrinsic rewards, could affect faculty's instrumentality beliefs. Instrumentality data that was analyzed showed that this factor of the VIE model was not significant as part of the regression model when predicting faculty motivation to use Blackboard.

Expectancy is a belief and typically based on past experience, self-confidence, and the perceived difficulty of the performance goals. The analysis of results showed that Expectancy was the only significant element in the model that predicted faculty motivation to use Blackboard. It showed that faculty members were more motivated by the convenience of the tools that Blackboard has to offer. Based on faculty members'

beliefs that their efforts would lead to certain level of performance, the expectancies were ranked as follows:

1) Better organize their course materials.
2) Do their job more effectively.
3) Would save them time in the long run.
4) Would like to see Blackboard take less time to setup their courses.
5) Extend their courses beyond classroom.
6) Engage students with different learning styles.
7) Finally, having a feeling of accomplishment.

Faculty expectancy beliefs could be modified by presenting ideas, features and trainings to show how effective Blackboard could be in their teaching. Based on the results of this study, Vroom's Expectancy theory was not very useful in predicting faculty motivation to use Blackboard. Two of the predictors in the regression model were not significant, although all the variables were useful independently based on their correlations with the Motivation to use Blackboard tools. If university administration would use the top three expectancies, instrumentalities and valences to modify some faculty beliefs, rewards and policies, they could increase faculty motivation to use a course management system.

Recommendations

The data collected in this study provided some ideas and recommendations for future research studies that could use course management systems and faculty to get more information about the process of motivation. The results obtained from the study suggest that it might be necessary to review the list of instrumentalities and valences associated with Blackboard use. The list used in this study had low rankings indicating that faculty did not see the list of valences or instrumentalities relevant or desirable when associated with Blackboard use. Higher rankings among instrumentalities and valences might make the model a better fit when predicting faculty motivation. Thus, the following recommendations were made:

a) After the selection of participants for a new study, conduct interviews with a big number of them, if possible, asking detailed questions regarding what expectancies, instrumentalities and valences faculty members believe could be relevant when using a course management system.
b) In this study, the researcher used a simple list of outcomes, instrumentalities and expectancies derived from literature that faculty members were asked to rate. It would be interesting to conduct a study where a group of faculty would be engaged in a training session on features and tools of a course management system and compare this group to faculty that did not get the training. The interviews conducted after this study could collect information about

expectancies, valences and instrumentalities and analyze if there were significant changes in these elements.

c) By researching course management systems and their features, it would be possible to have studies on a larger scale that would involve using 3-4 major course management systems and analyze if there is a significant change in faculty motivation. It would be necessary to identify similar features in all the course management systems and develop a comparable analysis of their tools.

d) Based on the results of the survey, there were many answers that some institutions were transitioning to a different course management system. Further research could look at that population and see if motivation to use Blackboard is any different from the new course management system that was implemented at those universities.

e) If financial and time constraints would not be an issue, future researchers could select more universities to be involved in a similar study. By selecting schools to represent the whole United States would allow getting results that could be generalized to a larger population.

f) Another possibility for this study is to change its direction and analyze how to motivate non-users of course management systems, see what incentives and attitudes could become attractive for that population to become active users of these instructional tools. The information could collect priceless information about faculty beliefs and attitudes that could be very valuable to the developers of course management systems. By trying to meet the needs of

faculty they could expand the market share of their product and supply a product that would be greatly appreciated.

In summary, this study adds some knowledge to the research of Vroom's expectancy theory and its usefulness in predicting faculty motivation. Data from the survey used in this research showed that faculty preferred or were motivated by Blackboard tools that would allow them to do their job more effectively. Based on results, rewards in forms of student evaluations and student ratings were more important than monetary or promotion incentives. Faculty believed that using Blackboard would allow them to meet the needs of the student population followed by their own needs for saving time when they prepare for teaching classes. The administration could increase faculty awareness about the benefits of using Blackboard in the instructional process, changing faculty attitudes and beliefs which could significantly boost the motivation to use these course management systems.

APPENDICES

Appendix A:

Survey Questionnaire:

Survey: Faculty Motivation and the use of Blackboard

Please answer the following questions by circling the chosen answer:

1. **Have you ever used any Blackboard tools? (If you answer "no" skip all and go to Q#34)**

   Yes
   No

2. **How many courses have you taught using Blackboard**

   1 2 3 4 5+

(Q3-9 Please rate the level of your expectancy when using Blackboard following the statements below Use the scales provided:

1 (never), 2 (seldom), 3 (sometimes), 4(often), 5(almost always)

3. **Using Blackboard will result in spending more time setting up my courses.**

   1 2 3 4 5

4. **Using Blackboard will allow me, in the long run, to save time for other professorial activities.**

   1 2 3 4 5

5. **Using Blackboard will allow me to better organize my course materials.**

   1 2 3 4 5

6. **Using Blackboard would allow me to engage students with different learning styles.**

   1 2 3 4 5

7. **Using Blackboard could allow me to extend my teaching beyond my classroom.**

   1 2 3 4 5

8. **Using Blackboard might lead to a feeling of accomplishment**

   1 2 3 4 5

9. Using Blackboard allows me to do my job more effectively.

1 2 3 4 5

(Q10-17) Here are some situations that could result from using Blackboard in your teaching activity. Please rate the likelihood of each event occurring: Please use the following ranking scale:

1 (Not at all likely), 2(Somewhat unlikely), 3 (50/50 chance) 4 (Quite likely), 5 (Extremely likely)

Using Blackboard might result in…

10. Getting an incentive pay or raise

1 2 3 4 5

11. Having more opportunities for a promotion

1 2 3 4 5

12. Getting better ratings on my student evaluations.

1 2 3 4 5

13. Improving my reputation among colleagues and department supervisors.

1 2 3 4 5

14. Having more control over my job by using the time I save on other professorial activities.

1 2 3 4 5

15. Having a feeling of accomplishment

1 2 3 4 5

16. Having a better reputation among my students

1 2 3 4 5

17. Overall, my department values the use of this course management tool.

1 2 3 4 5

(Q18-25) Please rank how important to you is each of the following outcomes. Please use the following ranking scale:

1 (Less Important), 2(Moderately important), 3 (Important) 4 (Quite important), 5 (Very important)

18. Getting an incentive pay or raise.

1 2 3 4 5

19. Having more opportunities for a promotion

1 2 3 4 5

20. Getting better ratings on my student evaluations

1 2 3 4 5

21. Improving my reputation among colleagues and department supervisors.

1 2 3 4 5

22. Having more control over my job by using the time I save on other professorial activities.

1 2 3 4 5

23. Having a feeling of accomplishment.

1 2 3 4 5

24. Having a better reputation among my students.

1 2 3 4 5

25. It is important that my department want to use this course management tool.

1 2 3 4 5

(Q26-33) Please rank your level of satisfaction while using Blackboard

26. To what extent did you make an effort to use Blackboard in the past?

1 (Very Low), 2(Low), 3 (Moderate), 4(High), 5(Extremely High)

27. Please rate the level of effort that you spent using Blackboard today.

1 (Very Low), 2(Low), 3 (Moderate), 4(High), 5(Extremely High)

28. I like Blackboard because it is easy to use.

1 (Not at all), 2(Not very), 3 (Neutral), 4(Somewhat), 5(Very much)

29. Overall, I have had a good experience while using Blackboard.

1 (Not at all), 2(Not very), 3 (Neutral), 4(Somewhat), 5(Very much)

30. How motivated are you to use the following Blackboard (BB) tools when planning your courses?

	Not at all	Not very	No opinion	Somewhat	Very much
BB Course Assignments	1	2	3	4	5
BB Grade book	1	2	3	4	5
BB Discussion board	1	2	3	4	5
BB Email	1	2	3	4	5
BB file exchange	1	2	3	4	5
BB e-reserves	1	2	3	4	5
BB Virtual classroom	1	2	3	4	5
BB Calendar	1	2	3	4	5
BB Adaptive release	1	2	3	4	5

31. Overall, how likely are you to use Blackboard in the next semester?

1 (Not at all likely), 2(Somewhat unlikely), 3 (50/50 chance) 4 (Quite likely), 5 (Extremely likely)

32. Based on your current satisfaction with Blackboard, if you had to buy it for personal use in your courses, how much would pay for the license to use it.

<$100
$100-300
$300-500
>$500

33. How likely are you to recommend Blackboard as a course management tool to your colleagues?

1 (Not at all likely), 2(Somewhat unlikely), 3 (50/50 chance) 4 (Quite likely), 5 (Extremely likely)

Alternative questions for people answering "NO" to: **Have you ever used Blackboard tools**?

34. Why have you not used Blackboard for your classroom instruction? Check all that apply.

___I did not know about its existence
___I do not have time to use it
___It was too complicated to use and I gave up
___I can do without it
___I dread technology
Other

35. What is your gender?

Male
Female

36. What is your age (in years)?

< 27
28-44
45-54
55-64
65 +

37. How many years have you been teaching in higher education institutions?

1-5
6-10
11-15
16-20
20+

38. Which of the following *best* describes your specialization area?

Business
Arts & Humanities
Sciences
Education
Health (Medicine, Nursing)
Engineering
Other_____

39. What is your current faculty rank?

Instructor / Lecturer

Assistant Professor
Associate Professor
Professor

40. What was your tenure status at this institution during the past term?

Tenured
Tenure-track
Non-tenure-track
No tenure system

Appendix B:

Cover letter for the Questionnaire

Dear Faculty Member,

My name is Marian Turcan, a doctoral student in the program of Career and Technology Education at Clemson University. Currently, I am working on my dissertation entitled "Expectancy theory as a predictor of faculty motivation to use a course management software tool."

This study is being conducted to learn about a teacher's motivation to use Blackboard. Hopefully, the results of this research will lead to an increased understanding of one's motivation related to the use of a course management tool like Blackboard. All information provided will be confidential. No names will be included in the study and all data is going to be summarized and coded. Your participation in this survey is voluntary and greatly appreciated.

Please take a few minutes of your time and answer the questions included in the survey using the link at the end of this letter. Estimated time to complete this survey is about 15-20 minutes.

If you are interested in the results please contact me at mturcan@clemson.edu and I will provide you with a summary of my findings and a list of tips of exactly how to use Blackboard more effectively.

Thank you so much for your time and cooperation.

Sincerely,
Principal Investigator
William Paige, PhD
Career and Technology Education
Eugene T. Moore School of Education
Clemson University

Co-investigator
Marian Turcan
Ed.D candidate
Career and Technology Education
Eugene T. Moore School of Education
Clemson University

If you have any questions or concerns about this study or if any problems arise, please contact William Paige at Clemson University at 864.656.7647. If you have any questions or concerns about your rights as a research participant, please contact the Clemson University Office of Research Compliance at 864.656.6460.

Appendix C:

Validation of IRB Protocol #IRB2010-011: Expectancy Theory as a Predictor of Faculty Motivation to Use a Course Management System

Dear Dr. Paige,

The Chair of the Clemson University Institutional Review Board (IRB) validated the protocol identified above using Exempt review procedures and a determination was made on **February 9, 2010**, that the proposed activities involving human participants qualify as Exempt from continuing review under Category **B2**, based on the Federal Regulations (45 CFR 46). You may begin this study with the understanding that you will not begin research at any institution without the acceptance of this approval by the IRB at that particular institution.

Please remember that no change in this research protocol can be initiated without prior review by the IRB. Any unanticipated problems involving risks to subjects, complications, and/or any adverse events must be reported to the Office of Research Compliance (ORC) immediately. You are requested to notify the ORC when your study is completed or terminated.

Please review the Responsibilities of Principal Investigators (available at http://www.clemson.edu/research/compliance/irb/regulations.html) and the Responsibilities of Research Team Members (available at http://www.clemson.edu/research/compliance/irb/regulations.html) and be sure these documents are distributed to all appropriate parties.

Good luck with your study and please feel free to contact us if you have any questions. Please use the IRB number and title in all communications regarding this study.

All the best,

Nalinee

Nalinee D. Patin
IRB Coordinator
Clemson University
Office of Research Compliance
Institutional Review Board (IRB)
Voice: (864) 656-0636
Fax: (864) 656-4475
E-Mail: npatin@clemson.edu
Web site: http://www.clemson.edu/research/compliance/irb/

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