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Understanding College Students' Readiness to Use Web 2.0 Technologies in Online Education

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COLLEGE OF EDUCATION

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2016

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MA, Webster University, 2003

BS, Southern Illinois University, 1996

Doctoral Study Submitted in Partial Fulfillment

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Abstract

Web 2.0 technologies offer many educational benefits in higher education. Leaders of the U.S. community college examined in this study desired to explore students' familiarity with the educational benefits of Web 2.0 tools before investing in technology upgrades for the college. The purpose of this quantitative survey research was to explore community college student readiness to use Web 2.0 technologies as part of their distance learning experience. The research questions were designed to clarify students' attitudes and behavioral intentions towards using Web 2.0 applications. Data were collected from 253 randomly selected distance-learning students using a survey derived from the decomposed theory of planned behavior (DTPB). The DTPB assesses individuals' likely actions related to using Web 2.0 technologies as a function of behavioral intentions reflected through attitude, subjective norms, and perceived behavioral control. Results of the Spearman rho analyses indicated significant positive relationships related to Web 2.0 applications between attitude and behavioral intentions, subjective norms and behavior, peer influence and subjective norms, and self-efficacy with facilitating conditions and perceived behavioral control. There was no relationship between perceived behavioral control and behavior. Additional findings revealed that students perceived the existence of a beneficial social network within the distance-learning environment. The results of this study facilitated college administrator awareness of students' perceptions of using Web 2.0 tools for learning, and suggest that implementing these tools would be beneficial for the students and college by creating a more inclusive learning environment for online students.

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Table of Contents

List of Tables

List of Figures

Section 1: The Problem

Introduction

Many U.S. college students using the interactive Web to communicate, socialize, entertain, and share information. These students are empowered with the resources provided by the Web, which is leading towards a technological culture that produces content for learning and sharing, reflection, and participation. People communicate to bring other people together around common ideas, beliefs, and interest. Whether verbally or nonverbally, members of a society have a desire to communicate and to connect with others. However people may choose to communicate, the World Wide Web has expanded communication options from simple information sharing to providing a participatory, collaborative environment that empowers its users.

Today, people at all levels of U.S. society enjoy the benefits of communicating through the use of enhanced technology, so they can be kept up-to-date with family members, friends, and current events (Diaz, 2010). In this era of new literacies, there is an urgent need for educators to expand classroom practices to include the social aspects of Web 2.0 that are students today find appealing (Asselin & Moayeri, 2011). In order to develop the constructs needed to create a learning environment that incorporates Web 2.0, it is necessary for researchers to determine how college students decide what aspects of the social web they prefer and if they even desire to use the Web as a learning tool in the classroom.

While technology may be considered as an impersonal method of communication, it has become a more pervasive and popular way to communicate. This study focused on

social networking sites, which Clafferty (2011) defined as "web-based services that permit users to create online a public profile within the system, and manage a list of participants with whom information can be shared and communicated" (p. 245). Communicating using social networks has become a significant part of college students' experiences. Students at U.S. college campuses engage in social networking to stay connected to classmates, family, and friends, with their most common reason provided for using social networking sites being "keeping in touch with friends" (Coyle, & Vaughn, 2008, p. 15).

Many U.S. undergraduate students use social networking tools very regularly. In a report by the Community College Survey of Student Engagement (CCSSE; 2009), 95% of students between the ages of 18 and 24 used social networking tools, with 64% using these tools several times a day. The CCSSE report showed that social networking use is increasing at a substantial rate, but that only 18% of the social media user-respondents actually used their social networking platforms for school/academic purposes. Furthermore, only 5% of students from the 663 institutions involved in the study had never used social media tools (Center, 2009). Other studies have also corroborated CCSSE (Hargittai, 2008; Kolek & Saunders, 2008; Kord, 2008; Pasek, More, & Hargittai, 2009). However, these studies have been limited in scope and were primarily focused on students at four-year institutions. This study examined community colleges students' potential for using Web 2.0 applications for academic purposes, and provides data regarding a two-year institution's use of social media for learning.

Furthermore, there has been a growing trend in higher education to incorporate technology into the learning environment in an effort to fulfill the technological expectations of students (Ajjan & Hartshorne, 2008). Students today are considered to be technologically savvy and have grown up using technology such as computers, cell phones, and the Internet (Ajjan & Hartshorne, 2009). These 'digital savvy' natives use social networking or Web 2.0 applications, wikis, social networks, social bookmarking, and blogs regularly (Lenhart & Madden, 2007; Pence, 2007).

Measures of good classroom practice all emphasize the importance of ongoing communication between the teacher and student. Research points to the fact that effective communication and dialogue leads to increased student success (Clark, Holstrom, & Millacci, 2009; DiSalvio, 2009). As social networking sites' popularity continues to grow, particularly with Facebook and Twitter, educators are becoming more interested in their potential use in education, particularly as an active learning and collaboration tool (Malony, 2007). Selwyn (2009) proposed that learners might benefit from a social network because they will find innovative and creative ways to collaborate, based on interests not served directly by traditional practices in the educational environment. Social networking tools, or Web 2.0 applications, are expected to empower active participation, promote opportunities for student writing and reflection, and encourage a collaborative and active community of learners (Ferdig, 2007).

The World Wide Web has become one of the dominant sources for supplying information to students (Ackermann, & Hartman, 2014). However, the use of Web 2.0 technologies has emerged as a major approach to ameliorate learning, information

sharing, and collaboration between students and teachers (Ferdig, 2007; Maloney, 2007; Pence, 2007; Simones & Gouveia, 2008). Web 2.0 applications also have characteristics that are useful in the educational setting, such as the ability to contribute to active social learning, to present opportunities, and to create an environment for effective, efficient feedback between learners and faculty members. Therefore, social networking applications may provide a place for extending the traditional classroom and provide a technological space for groups that have similar educational interests and needs (Ajjan & Hartshorne, 2009).

Definition of the Problem

The Community College of Central Texas (CCCT; pseudonym) has provided instructor led college courses to the Navy's program for Afloat College Education since the 1980s. This college has long served U.S. military students and has made a commitment to provide workforce development programs designed to meet military community needs. This college provided distance education by actually going onboard Navy ships while at sea and teaching college courses. By providing these courses onboard ships, a quality education was made accessible to sailors while underway at sea—distance learning in its earliest form. This college continues to be the premier distance-learning provider for the military community; this study was designed to explore the ways in which incorporating Web 2.0 technology into their distance learning model may be beneficial.

The study explored students' actual use of Web 2.0 technologies, their awareness of the potential of Web 2.0 applications to supplement their learning, and factors that may

lead to adoption decisions. Although CCCT has been a leading distance learning provider for the military community, it was unclear if CCCT students were aware of the benefits of Web 2.0 technology and how these technologies might be used to supplement in-class learning. Determining students awareness was intended to help the institutions leaders, and faculty decide what technology to employ in order to meet the technological expectations of its students. Limited empirical evidence exists with which to address the relationship between online social networking applications and student awareness of the potential of Web 2.0 technologies to supplement student in-class learning.

There is a knowledge gap between the ways in which students use Social Networking Tools (SNT) in their personal lives and how they are used to supplement learning in the classroom. Students may, in fact, be unaware of the educational applications of these tools. Therefore, this study will help reduce the knowledge gap by exploring the relationship between community college students' awareness of how Web 2.0 technologies intersect with higher education, and develop a set of recommendations that support the implementation of SNTs to supplement the learning environment.

Rationale

The purpose of this study was to examine students' actual use and awareness of the benefits of Web 2.0 applications in a community college in central Texas. Additionally, a secondary goal was to understand the factors that impact student decisions to adopt these tools. The theoretical framework was the decomposed theory of planned behavior (DTPB) based on the theory of planned behavior (TPB) proposed by Ajzen (1985). Ajzen (1991) stated, "a key element of TPB is that individuals' actions are

a function of behavioral intention that in turn is a function of attitude, subjective norms, and perceived behavioral control" (p. 188). In order to better understand the impact of specific variables on actual behavior and the interrelationship among these variables, attitude, subjective norms, and perceived behavioral control were decomposed into lower level belief constructs (Taylor & Todd, 1995).

TPB predicts intention and in turn behavior, and DTPB is a more expanded model of TPB used to better understand specific determinants of computer usage intentions and behaviors. According to Taylor and Todd (1995), DTPB has stronger interpretive power compared to the original TPB; it was therefore used in this study to help explain factors leading to students' adoption and use of Web 2.0 applications to support in-class learning. Research specific to technology use in higher education also use the Technology Acceptance Model (TAM; Davis, 1989; 1993) along with the Theory or Planned Behavior, and the decomposed theory of planned behavior. TAM predicts use acceptance of technology (Taylor, Todd, 1995).

This study provided a compelling body of evidence for community colleges to move forward in incorporating social networking technology into the classroom environment, in order to enrich the communication and learning experiences of their students. CCCT is now able to meet the expectations of these "digital natives," it is also able to respond to the growing desire in higher education as it incorporates new communication technologies using Web 2.0 applications (Bennett, & Maton, 2010). This is important for stakeholders particularly during an era of budgetary challenges because most Web 2.0 social networking platforms are free. Thus, three goals of this study were

(a) to provide information on how Web 2.0 technologies intersect with the world of higher education from the students' perspective; (b) to offer recommendations for implementing social media tools to enhance students' educational experience; and (c) provide an argument for taking advantage of social media tools to enhance students' educational experience. Johansmeyer (2009) stated:

> Public community colleges face the same risks as other taxpayer-funded organizations and institutions, and social media tools when not used are the equivalent of flushing budget dollars, and that these tools easily engage students outside the classroom increases the odds of success (p. 1).

At the time of this study, CCCT usesd Twitter, a social networking application to communicate globally with students by broadcasting messages about campus life activities. Preliminary studies have suggested that Web 2.0 applications are useful tools for a variety of campus needs, such as student group learning, faculty department work, staff collaboration, and student – teacher collaboration (Alexander, 2006).

This study may have implications for other community colleges considering Web 2.0 by defining the ways that Web 2.0 technologies are currently used by students, compared to how they could be used more broadly to deepen the learning experience. Past research has shown that technology use in the classroom has grown and become a significant learning delivery tool (Maloney, 2007; Pence, 2007; Simones & Gouveia, 2008). However, use of technology in the classroom primarily focused on content delivery, such as accessing and turning in course materials (Ajjan & Hartshorne, 2008).

Evidence of the Problem at the Local Level

Social networking tools can help students become more engaged in their learning environment. In a survey conducted by the Community College Survey of Student Engagement, it was revealed that the use of social networking tools was clearly growing in frequency (CCSSE, 2009). The 2009 CCSSE cohort included more than 400,000 students from 663 institutions that assessed students' effort given to their studies, whether they interacted with faculty and staff, and whether there where academic challenges (Center, 2009). The 2009 survey included a particular focus on students' use of Web 2.0 social networking tools, and other studies also showed that the more engaged students are in such activities and relationships, the more committed they are to learn (Fisher & Mix, 2010). The survey showed that students who used social media several times a day for academic purposes, such as communicating with other students, instructors, or staff about coursework, had higher levels of engagement as compared to students who said they do not use such tools at all (CCSSE, 2009). Although the survey revealed promising results about how students and colleges are using Web 2.0 tools, Marklein (2009) stated "colleges are not taking advantage of that particular set of tools for making connections with students to the extent that they could" (p. D5). This suggests that underutilizing Web 2.0 tools to enhance the learning environment could hinder the learning experience with students immersed in technology as method of creating, collaborating, and communicating.

Watson, Smith, and Driver (2006) noted several challenges to incorporating social networking as an educational tool. First, an assessment for understanding the feasibility

of implementation and budgeting needs to be conducted. The second challenge is to determine both faculty acceptance and student understanding of how social networking tools will enhance the learning environment. Lastly, some students may be apprehensive about interacting with faculty members or administrators on sites typically used as places of social interaction and not as places for conducting school-related business. Therefore, an effort needs to be made to promote social networking use as a means for communicating about academic needs and concerns in regards to learning.

Community colleges have had difficulty in justifying the implementation of new technology, particulary during economic recessions, due to associated costs (Boulos, Maramba, & Wheeler, 2006). Institutions are constantly seeking ways to integrate technology in teaching, but most still avoid Web 2.0 applications (Boulos et al., 2006). Furthermore, there is no monetary cost associated with Web 2.0 applications, since there is a large number of applications that students can use, with little or no cost, training, or equipment. Fully exploring the benefits of implementing Web 2.0 technology for institutional use should therefore be a logical endeavor for all colleges.

Web 2.0 applications have been adopted and used by many universities and educational providers because Web 2.0 applications are easy to use and have either free or low-cost hosting and service options (Boulos, Maramba, & Wheeler, 2006). Olaniran (2009) stated, “Web 2.0 social software offers structure that is not confined to boundaries of educational institutions, which helps reduce cost of traditional institutional learning, while simultaneously saving time” (p. 267). Additionally, most students already know

how to use Web 2.0 applications for social purposes, so this study explored their awareness of its use in the learning environment.

CCCT has attempted to close the technology gap by implementing some social-network tools to reach out to students, providing them information about events on campus, using Twitter® and Facebook® for announcing campus wide activities and student services to improve communication among faculty, staff, and their student population on-campus and online (Central Texas College, 2010). The institution has also started the process of implementing and using virtual machines (VM) and cloud computing in an attempt to keep up with "up and coming technological trends" (Central Texas College, 2010). These examples show that the college itself has made significant efforts towards closing the technology gap by using social networking tools as a general communication tool. However, the use of social networking tools as an integral part of the learning environment still has not been fully explored.

Evidence at the local level reveals that social networking tools are being used by college students for personal use, but colleges are not taking advantage of these tools for making a connection with individual students in regards to enhancing the learning environment. The 2009 CCSSE study supported the fact that the more engaged students are with using of SNTs, the more committed they are to learn (Fisher & Mix, 2010). Although challenges exist in incorporating social networking as an educational tool, promoting these tools may lessen concerns and could foster faculty acceptance and decrease student apprehension.

Evidence of the Problem From the Professional Literature

In higher education, there is a growing trend to integrate technology into the classroom environment as an effort to actualize the technology expectations of students. El Mansor and Mupinga (2007) asserted that higher education institutions are turning to hybrid and online courses to meet the growing demands for nontraditional students. Lorenzetti (2004) stated that "a hybrid course, also known as web-enhanced/assisted, or blended course, is a course that combines elements of face-to-face instruction with elements of distance teaching" (p. 2). Using hybrid courses institutions can free up overcrowded classrooms and allow faculty to reach a larger audience, making such courses more cost effective.

Since 2004, the Internet has significantly evolved as users' online interactions changed. Caudill (2008) stated, "rather than Internet users being 'given' content online produced by a technically-savvy few, new technologies and interfaces allowed searchers actually to use the Web in a collaborative, interactive way" (p.11). Internet users can read, create, and collaborate with the worldwide audience, and this interaction through Web technology will continue to increase. Lenhart (2009) stated that younger adults (traditional-age students) are more likely than older adults to use social networking sites (p. 6). In regards to engagement, student persistence, and retention, CCCSE (2008, 2009) addressed the value of establishing personal connections, creating contact outside of the classroom, increasing active learning, and strengthening student-faculty interaction. Active learning and establishing personal connections among students and faculty is important to colleges and universities because Web 2.0 applications encourage greater

participation and interaction between learners and teachers, which will result in communities of learning, support better feedback conditions, and facilitate more active learning engagement (Boulos & Wheeler, 2009; Selwyn, 2007).

Most of the current research focuses on the use of SNT in traditional four-year colleges and universities rather than community colleges (Franklin & Van Harmelen, 2007; Hargattai, 2008; Koleck & Saunders, 2008; Kord, 2008; Pasek, More, & Hargittai, 2009). While the use of SNT continues to escalate, there is a growing need to understand whether these tools may be incorporated into effective educational practice in community colleges. Furthermore, research is needed to probe students' awareness of the benefits of SNT or Web 2.0 to supplement in-class learning and to better understand factors that influence student decisions to adopt these tools. Current research also does not adequately address students use of social networking tools in regards to education, social networking tools that students are utilizing for their education, or that students are aware of the applications of SNT to supplement in-class learning. The purpose of ths study was to explore the roles of student perceptions, attitudes, norms, peer influence, and self-efficacy in the use of Web 2.0 technologies.

Definitions

Community College Survey of Student Engagement (CCSSE): A paper-based survey administered to participating member community college students in the spring semester. This survey was designed by researchers and experts in the field to measure community college students' engagement in the college experience. The items are clustered in five benchmarks: Achieve and Collaborative Learning, Student-Faculty

Interaction, Academic Challenge, Student Effort, and Support for Learners (CCSSE, 2009).

Course Management Systems: Virtual learning environments where online courses take place (e.g., Blackboard, WebCT, Angel, Saki, Moodle, etc.).

Digital native: Generally seen as people who are early adopters or who are adept at using technology because of high access to technology (Pence, 2007).

Facebook: A "social utility [with over 200 million users] that helps people communicate more efficiently with their friends, family and coworkers" (Facebook, 2009a, About Facebook, para. 1). Facebook was founded in 2004 with a mission to give "people the power to share and make the world more open and connected" (Facebook, 2009b, Company Overview, para. 2).

Instant Messaging: A form of online communication that allows real-time interaction through computers or mobile devices (Solomon & Schrum, 2007, p. 69). This communication allows multiple people to connect through a medium that allows for synchronous text conversations to exist in one interface.

Online Social Network Tools (SNT): Virtual, online social tools, such as Twitter, MySpace, Facebook, and Instant Messaging, which are used by mainstream society and students to communicate with and remain connected to their social networks.

Tweets: Electronic messages sent through a Twitter-enabled device or application containing no more than 140 characters.

Twitter: A real-time short messaging service that works over multiple networks

and devices (Twitter, 2009, About Us, para. 1). These electronic short messages are called tweets.

Web 2.0: Online applications that provide a social writing platform for collaborations among those in a group or of similar interests. Social writing platforms intersect with higher education through appearing to be logistically useful tools for a variety of campus needs, student group learning, faculty department work, staff collaboration, and student – teacher collaboration (Alexander, 2006).

Virtual Learning Environment (VLE): Online platforms such as Blackboard that are confined within the boundaries of a learning institution and consist of relational ties between social and material elements, not necessarily online, computer-mediated connections (Enriquez, 2008). VLEs are distinct from social networking or Web 2.0 environments, which exhibit an exchange of information as a collaborative tie in terms of knowledge construction, where central actors who facilitate collaboration or influence knowledge construction may be identified.

Significance

The results of this study may help Community College of Central Texas determine the potential for social environments to be more fully merged with educational ones to gain learning, strategic, and financial benefits. Using Web 2.0 applications are believed to provide several benefits because it enables an active student—teacher participations, promotes student publication and reflection, and fosters a collaborative and active community environment for learners (Ferdig, 2007). This study could also

provide information to other two-year colleges interested in exploring the use of social networking as a pedagogic tool.

Keppler (2010) asserted that "using technology to complement or supplement traditional methods can lower operating costs and bring about other pedagogical and mission-based benefits as well" (p. 32). Many institutions have increased technology use to mitigate budget shortfalls, such as, replacing class registration booklets with online e-files linked to the departments Web site, using Web-based student communication tools, and online personal and academic counseling. Web-based services for education institutions are more cost effective and in most cases easier to sustain in challenging economies; students also prefer Web-based programs, which create an excellent trade-off (Keppler, 2010).

Guiding Research Questions

The following research questions were used to guide the design and implementation of this study and were adopted from Ajjan and Hartshorne (2009). Subjective norms are defined as the social pressures that make an individual perform a particular behavior (Ajzen, 1991). Perceived behavioral control refers to situations where individuals do not have complete control over their behavior and are made of two components, self-efficacy and facilitating conditions (Ajzen, 1991; Bandura, 1982; Triandis, 1979).

RQ1. How do students' attitudes towards using Web 2.0 applications relate to behavioral intentions to use the technology?

RQ2. How do students' subjective norms relate to the use of Web 2.0 of students?

RQ3. How does perceived behavioral control relate to the use of Web 2.0 applications by students?

RQ4. How does peer (other students) influence to use Web 2.0 applications affect the subjective norms of students?

RQ5. How does self-efficacy of using Web 2.0 applications and the availability of resources and technology relate to perceived behavioral control of students?

Past research on the topic suggested that there is a growing trend in higher education to incorporate technology into the classroom environment in an effort to fulfill the technological expectations of students (Ajjan & Hartshorne, 2009). Most students today are referred to as being 'digital natives' in the literature, which refers to a generation of tech-savvy young people immersed in technology (Bennett & Maton, 2010). Currently, little research has empirically explored students' perceptions of the benefits of using Web 2.0 applications to support their in-class learning. However, research does exist that explores the relationship between social networking and student engagement. Simones, eGouveia (2008), Kale (2014), and Bajt (2011) suggests that colleges should take advantage of social networking or Web 2.0 tools for making connections with students as a free technological means to enhance the educational experience of students.

This study endeavors to reduce the gap in practice by exploring the relationship between community college students awareness of how Web 2.0 technologies intersect with the world of higher education, and to give the institution usable data to support implementing social network tools (SNT) to supplement the learning environment.

Furthermore, this study is designed to reduce the gap in practice regarding how online SNT are used in community colleges, and students' awareness of the learning applications of these tools.

This project study promotes positive social change through increased awareness of how the ever changing and evolving new technologies are improving learning and student engagement in the institutions of higher learning. Social networking connects people globally and provides a platform for communicating change that can reach communities worldwide. Furthermore, this project study serves as a catalyst towards bringing social and community systems, at various levels, together to influence whether Web 2.0 applications should be fully implemented into the institutions (Bergvall-Kåreborn, Bergquist, & Klefsjö, 2009). The results of this research may contribute to positive social change by implementing Web 2.0 applications that would further expand access to learning, and in regards to social change, allow for organic growth and use of these technologies globally.

Review of the Literature

The theoretical framework used in this study stems from the theory of planned behavior (TPB). Ajzen (1991) stated that individuals' actions are a function of behavioral intention that in turn is a function of attitude, subjective norms, and perceived behavioral control; this is the basis of (TPB). Constructs alone should not be the only determinant for behavior, but also examining the beliefs, because these are antecedents to the constructs. Beliefs as the antecedent help to understand the process through which TPB constructs are related to intentions (Greaves, Zibarras, & Stride, 2013). TPB has also

been applied in areas of technology, health care, and government (Greaves et al., 2013). TPB has also been effectively used in explaining individual behavior of adoption well (Cheon, Lee, Crooks, & Song, 2012). TPB explains human behaviors and has been used to determine students and teachers belief in integrating social networking technology into educational setting to enhance learning (Atmaca, 2014; Montano & Kasprzyk, 2015).

To better understand the impact of specific variables on actual behavior and the relationships among the attitude, subjective norm, and perceived behavioral control variables, I decomposed these into lower-level belief constructs, in alignment with Taylor and Todd (1995). According to Taylor and Todd (1995), the decomposed theory of planned behavior (DTPB) has stronger explanatory power compared to the original TPB. When examining Web-based technologies with students' needs, their needs are expected to influence behavioral intention through attitude (Cheung, & Vogel, 2013). Furthermore, DTPB has strong predictive and explanatory power regarding user intentions (Shiau & Chau, 2016). Therefore, in this study the DTPB was used to help explain factors leading to students' adoption and use of Web 2.0 applications to support in-class learning.

Hartshorne and Ajjan (2009) provided a substantiated example for using the (DTPB) to examine student awareness of the pedagogical benefits of Web 2.0 to supplement in-class learning. Hartshorne and Ajjan's studies have shown consistently the predictive power of DTPB due to multidimensionality of its components (Sadaf, Newby, & Ertmer, 2012). Furthermore, Hartshorne and Ajjan's study gives a better understanding of factors that influence student decisions to adopt these tools. User acceptance is a critical factor for demonstrating the value of the system, therefore, using DTPB

determined a student's behavioral intention to use Web 2.0 tools and acceptance of the system (Lee & Lehto, 2013; Padilla-MeleNdez, Del Aguila-Obra, & Garrido-Moreno, 2013).

Dawley (2009) provided information related to how social network knowledge construction is becoming an emerging form of teaching and learning, which supports the idea of how social network use is becoming a bona fide pedagogy. Hung and Chou (2015) examined students perception of instructor roles in blended and online learning environments, suggesting that students want and require a wide variety of technological tools to deliver course materials and to assist student learning. Kruger-Ross and Holcomb (2012) suggested that sound judgment should be exercised to avoid placing learning before technology, and discuss how Web 2.0 tools are used most effectively when they are connected with sound methodology and teaching practices. Therefore, understanding students readiness to use, and awareness of the learning applications of Web 2.0 will inform learning methodology how learning can be supported by technology, not driven by it (Kruger-Ross & Holcomb, 2012).

Pollara and Zhu (2011) found that social networking can be used effectively for educational purposes. The primary social network tool used in this study is Facebook, although Blogs are also social media tools that support both active and social learning by providing an environment that promotes collaborative activities (Top, 2012). The educational potential of Facebook has also been widely discussed and adopted in educational learning settings to enhance student-learning experiences and to improve students' academic achievement (Ylimaz, Yilmaz, Ozturk, Sezer, & Karabemir, 2015).

Students engage in social networking tools in their everyday lives and have created interest within education because of potential new ways of engaging students independently and collaboratively (Bennett, Bishop, Dalgarno, Waycott, & Kennedy, 2012). Blogs are less important than Facebook in this climate because studies have shown that lecturers generally blog and update content less frequently then is needed to facilitate effective communication within groups (Rosmala, 2012). The remaining references support both the DTPB theory, and the relationship between pedagogy and technology.

Figure 1. Student use of Web 2.0 technologies in the classroom-based on theory of planned behavior. Adapted from "The theory of planned behavior," by I. Ajzen, 1991, *Organizational Behavior and Human Decision Processes, 50,* pp. 179-211. Copyright 1991 by Elsevier Inc.

The theory of planned behavior and the decomposed theory of planned behavior insist that behavior is a direct function of behavioral intention and both show that behavioral intension as a function of attitude, subjective norms, and perceived behavioral control (Ajjan & Hartshorne, 2008; MacFarlane & Woolfson, 2013). Figure 1 shows how behavioral controls are all decomposed into lower level belief constructs (Taylor & Todd, 1995). Ajzen (1991) defined attitude "as the degree to which the individual favors the behavior being examined" (p. 188). My study focused on three attitudinal components: perceived usefulness, perceived ease of use, and compatibility.

Subjective norms are social pressures that make an individual perform a specific behavior (Ajzen, 1991; Ertmer, Ottenbreit-Lefwich, Sadik, Sendurur, & Sendurur, 2012). In this study, the following assumptions were made: various social groups within selected colleges may have an effect on the population sample where there is social pressure from peers (i.e., other students) and perceived behavioral control (situations where individuals do not have complete control over their behavior) is constructed of two components, self-efficacy (defined here as personal comfort with using technology) and facilitating conditions (the availability of resources such as time, money and other resources needed to use the technology)(Bandura, 1982; Triandis, 1979; Wakefield & Wakefield, 2016). Furthermore, the role of self-efficacy in technology shows that physical proximity should not confine and influence how teachers use innovation across broad social networks, but how techonolgy transforms learning due to the nature of speed and reach (Bandura, 2012; Sanchez, Cortijo, & Javed, 2014).

Web 2.0 Defined

The term Web 2.0 has several definitions that are all synonymous with the term *Internet technology*. Scholars have debated the term Web 2.0. Dale Dougherty, vice-president of O'Reilly Media officially defined the term Web 2.0 as essentially any application that has contributed towards transforming the Internet from a generally read-only (Web 1.0) environment to a read-write platform for end users (Rosen, 2008). Rosen (2008) stated that "Web 2.0 is the next phase of Internet usage…the first phase, Web 1.0, focused on presenting information. The next phase, Web 2.0, enables both presentation and participation" (p. 212).

Berners-Lee, the original inventor of the World Wide Web, envisioned that it would grow into a depository of knowledge through which individuals could share, collaborate, and create information (Aghaei, Nematbakhsh, & Farsani, 2012). Blogs, Facebook™, Twitter™, and Wikipedia™ are some examples of social software, or Web 2.0 applications (information presentation and participation), whereas Listservs, search engines, and websites are an example of Web 1.0 (information presentation). Rosen (2008) described these, saying:

> Many Web 2.0 tools have three unique features that are helpful in facilitating social sharing: (1) user-initiated publishing of information, (2) social-sharing options with privacy controls that allow users to choose with whom information is shared, ranging from one-to-one to small, controlled groups to large-scale public sharing, and (3) social networking options (i.e., the possibility of developing an Internet-based community around specific topics, publicly sharing, discussing,

> and collaborating on content, whether text, pictures, movies, or other media (p. 213).

Web 2.0 digital tools have transformed teaching and learning by allowing both students and teachers the ability to participate in knowledge creation and interactively build distributed communities, or networks of learning (Kitsantas, 2013; Rosen, 2008). The educational potential of various Web 2.0 tools have gained attention from educators globally because of the affordance of communicating, expressing ideas, and collaborating between students and teachers (Frazier & Sandera, 2013; Kale, 2014).

There is a growing number of research that exist that supports teaching and learning using a variety of social media tools suggesting that they encourage creating, editing, and sharing of content (Li, Helou, & Gillet, 2012). The use of social media is apparent at universities where the technology is transforming the way students communicate, collaborate, and create. Tess (2013) discussed how social media's use and influence are evolving, and the notion that social media could be an effective tool for educational purposes has received recent attention. Furthermore, the potential role of social media as a learning platform is worth investigating (Tess, 2013; Veletsianos & Navarrete, 2012).

Implications

This study has important implications for other institutions using Web 2.0 technologies by closing the gap between how students are using Web 2.0 applications socially and the students' awareness of the educational benefits of Web 2.0 technology. This project also addresses the complex diverse and contentious themes related to social

networking in higher education, specifically using social networking for educational purposes. Studies in the past have shown that technology use in the classroom has increased and become a significant learning delivery tool, however, current uses of technology in the classroom primarily focus on content delivery, such as presentations, and accessing and turning in course materials (Ajjan & Hartshorne, 2008). Most recently, Web 2.0 applications have shown great potential to further improve learning and increase the sharing of information between learners and teachers (Ferdig, 2007; Maloney, 2007; Pence, 2007; Simoes & eGoueia, 2008). In order to further inform other institutions on how to better integrate Web 2.0 technologies, it is important to explore the students' actual use and awareness of the potential of Web 2.0 technologies to supplement future classroom learning.

Summary

In this section, I defined the need to examine student awareness of the educational benefits of Web 2.0 to supplement in-class learning and to better understand factors that influence students' decisions to adopt these tools. I also provided a rationale for conducting the study. In the review of the professional literature I discussed the history of social networking technologies in higher education, how social network knowledge construction is becoming an emerging form of teaching and learning, and how it can be used effectively for educational purposes has provided a rationale for this study. Section 2 presents a plan for data collection to determine the intentions of students to adopt Web 2.0 technologies as tools to support learning in their courses, and faculty use of Web 2.0 in respondents' courses.

Section 2: The Methodology

Introduction

I used a descriptive survey approach in this study to examine student awareness of the educational benefits of Web 2.0 to supplement in-class learning and to understand better factors that influence student decisions to adopt these tools. The Web 2.0 technologies examined in this study comprised applications that provide a social writing platform for collaborations among those in a group or of similar interests. This section outlines procedures I used in the collection and analysis of data related to this study. I used these findings to identify university students' awareness of the benefits of using Web 2.0 technologies to supplement traditional classroom instruction and determine the factors that influence student decisions to adopt Web 2.0 technologies in the educational arena.

Researchers have documented that social networking sites may provide a forum for extending the traditional classroom and provide a technological space for groups that have similar educational interest and needs (Ajjan & Harthshorne, 2008). The data collected and evaluated in this project study followed the path of these researchers and their findings. The direct implications of this study are limited to one institution. However, on a broader scale, it provides institutions using Web 2.0 technologies with more empirical data to use in closing the gap between how students are using Web 2.0 applications socially and the educational benefits of using Web 2.0 technology.

Research Design and Approach

To answer the research questions in this study, I employed a descriptive survey research design. According to Creswell (2008), survey research is a popular design in education. Creswell (2008) stated that "survey research designs are procedures in quantitative research in which investigators administer a survey to a sample or to the entire population of people to describe the attitudes, opinions, behaviors, or characteristics of the population" (p. 388). Using this research design helped to determine students' awareness of the educational benefits of Web 2.0 to supplement in-class learning, and to understand factors that influence student decisions to adopt these tools, as suggested by Ajjan and Hartshorne (2009).

Quantitative data revealed if students use of Web 2.0 applications for learning had positive effects on their behavior in the learning environment. The utilization of the survey in Appendix B helped determine students' attitudes towards using Web 2.0, behavioral intentions, students' subjective norms, perceived behavioral control, and peer influence as it relates to the usage of Web 2.0. The survey provided specific data that was used to answer each research question. A variation of the survey was used in many research designs and has produced reliable data consistently (Ajjan & Hartshorne, 2008).

According to Fink (2006), a survey method should be used when the information needed should come directly from people. According to Creswell (2008), "surveys can help identify important beliefs and attitudes of individuals," which was a goal of the study's data collection process (p. 388). The use of a survey also provided a time- and resource-efficient means of collecting data, as suggested by Lodico, Spaulding, and

Voegtle (2010). The one-time survey used in this study took the form of an online questionnaire, a survey type that is flexible and convenient for both student and faculty and facilitates ease of data collection, and which increases the return rate (Perkins, 2004).

I employed Cronbach's alpha to assess the internal reliability of the instrument. Creswell (2008) stated, "if the items are scored as continuous variables (e.g., strongly agree to strongly disagree), the alpha provides a coefficient to estimate consistency of scores on an instrument" (p. 171). I conducted a data analysis utilizing path analysis models to test the hypothesized relationships. Path analysis can isolate real from spurious effects and is concerned with estimating the significance of the linkage between variables (Harthshorne & Ajjan, 2009). After conducting confirmatory factor analysis to test out how well the data fit the item scales, the results of the measurement model did not present a good model fit. Also, because I had less than four items per scale, I had to evaluate all scales as if they were 1 model, because four items are needed to run a confirmatory factor analysis (CFA) for only one scale (Kline, 2011).

A large sample size is typically needed to have a valid model (Kline, 2011). However, too large of a sample size can affect the chi-square statistic, making it difficult to not have significance (Kline, 2011). Due to the findings of the CFAs, I explored other goodness of fit models (GFIs). Because I could not find another good model fit for the data, I evaluated the research questions using linear regression, more specifically, the nonparametric Spearman rho correlation. I used the Spearman rho correlation because it does not make the same normality assumption that the simple linear regression makes (Pallant, 2010).

I analyzed the results from the study using the SPSS statistical software. Data collection began once Walden's Institutional Review Board (IRB) approved the project study (approval #:01-11-13-0143157, expiration 01-10-14). All surveys were collected from students enrolled in the distance-learning department at a community college. The Chancellor of Distance Learning gave me permission to conduct my study along with access to participants.

Setting and Sample

Population

In this study, I sought to have a sample size of 500 students based on the sample size formula illustrated on Fowler's (1988) Sample Size Table. However, the actual population for this survey research consisted of 253 distance learning students. Table 1 provides demographic information about the students who participated in the study. I applied a simple random sampling technique to select students for participation in the survey, in alignment with Lodico, Spaulding, and Voegtle (2010). To generalize the results from the sample to a population, I used a sample error formula, as suggested by Creswell (2008, p. 630). Surveys were distributed to distance learning students who received an email invitation to take the survey via a student services representative. As the researcher, I had no relationship with the students and no working relationship with the college's staff and administrators; all survey participation was voluntary and anonymous.

The participants answered several questions in regards to gender, age, and grade classification (freshman or sophomore). In sum, I requested 500 students to complete

surveys via email; 253 students returned completed surveys, representing 51% of the initial sample.

Descriptive Statistics

A total of 253 participants took part in the study. Because I employed structural equation modeling, multivariate outliers were examined for via Mahalanobis Distances. With 29 total items in the model, the critical value for the Mahalanobis Distance is $\chi^2(29) = 61.10$ at $p = .001$ (Tabachnick & Fidell, 2012). A total of 14 participants were removed as a result of examining the data for multivariate outliers. I conducted my analysis on the remaining 239 participants.

A slight majority of the participants were male (51%), and 53% were 21-29 years old. The majority of the students were sophomores (55%). All but three participants engaged in social networking (99%). Only seven participants (3%) did not use wikis, and all but 10 participants used blogs (96%). Frequencies and percentages for participant demographics are presented in Table 1.

Table 1

Frequencies and Percentages for Participant Demographics

Demographic	*n*	%
Gender		
Female	118	49
Male	121	51
Age		
18-20	11	5
21-29	127	53
30-39	65	27
40-49	34	14
50-59	1	0
School year		
Freshman	106	44
Sophomore	132	55
Senior	1	0
Frequently used Web 2.0 technologies*		
Blogs	229	96
Wikis	232	97
Social networking	236	98
Social bookmarking	192	80
Other	156	65

Note. * participants could select more than one response

Participants rated how often they used seven different Web 2.0 technologies, with answers ranging from "don't use / don't plan to use" to "always use." Social networking had the highest frequency for "always use" (61%), followed by instant messaging (55%). Social bookmarking was the item that was most commonly selected for "don't use / don't plan to use" (2%). Audio/video conferencing was the most-commonly selected item for don't use / plan to use (18%), followed by social bookmarking (15%). Frequencies and percentages for use of Web 2.0 technologies are presented in Table 2.

Table 2

Frequencies and Percentages for Use of Web 2.0 Technologies

	Don't use / Don't plan to Use		Don't Use / Plan to Use		Social networking		Frequently Use		Always use	
Technology	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Blogs	3	1	19	8	71	30	112	47	34	14
Wikis	-	-	10	4	72	30	120	50	36	15
Social networking	1	0	-	-	5	2	86	36	146	61
Social bookmarking	5	2	35	15	78	33	93	39	28	12
Instant messaging	2	1	-	-	8	3	97	41	131	55
Internet telephony	1	0	27	11	109	46	82	34	20	8
Audio/video conferencing	4	2	42	18	111	46	65	27	18	8

Instrumentation and Materials

In this study, I used an adaptation of a survey instrument that employed the DTPB as its guiding framework. The survey consisted of three sections including (a) demographic data, (b) Web 2.0 Technology comfort and usage, and (c) utilization of Web 2.0 technologies in class. The survey was adapted from previous studies (Baylor & Ritchie, 2002; Davis, 1989; Taylor & Todd, 1995; Ajjan & Hartshorne, 2008; 2009). The instrument consisted of a series of questions asking participants to select the best choice answer, and questions using a five point Likert-type scale, which consisted of responses (strongly disagree to strongly agree) to questions examining factors that influence student intentions to use Web 2.0 technologies in their courses. The survey items focused on areas of actual usage, behavioral intention, attitude, ease of use, perceived usefulness, subjective norms, perceived behavioral control, peer influence, superior influence, compatibility, facilitating conditions, and self efficacy (Ajjan & Hartshorne, 2009).

Lastly, the survey included three categorical demographic items asking for gender, age, and grade classification.

Survey Validity

I established validity of the instrument used in the study by conducting a pilot by surveying 15 participants, and validity scores established by the studies from which the current instrument is drawn (Ajjan & Hartshorne, 2008; Baylor & Ritchie, 2002; Davis 1989; Taylor & Todd, 1995). I modified some of the items to ensure that the survey would fit the environment; during pilot testing, content validity was established, which consisted of sampling validity and item validity. Lodico, Spaulding, and Voegtle (2010) stated, "sampling validity examines the breadth of items being asked, item validity focuses on the depth of the items themselves" (p. 93). Fifteen students took the pilot test to establish its face validity. The pilot group found the instrument understandable and through feedback, they indicated that they were able to answer the questions without difficulty. Face validity determines if the instrument appears to be measuring what it intends to measure (Lodico, Spaulding, & Voegtle, 2010).

Survey Reliability

The survey instrument produced results of reliability values ranging from 0.47 to .93, which is acceptable for exploratory research (Ajjan & Hartshorne, 2008; Nunnaly, 1978). Nunnally (1978) recommended that instruments used in basic research have reliability of 70 or better (p. 245). According to Ritter (2010), Cronbach's alpha was developed based on the necessity to evaluate items scored in multiple answer categories.

I conducted a Cronbach test for alpha reliability on each of the scales. Reliability ranged from .47 (behavior) to .93 (peer influence). Behavior was the only scale among the eleven scales to have unacceptable reliability (< .70). Therefore, caution should be taken in the interpretation of results that use the behavior scale. Table 3 presents Cronbach alpha reliability as well as means and standard deviations for each of the scales.

Table 3

Cronbach Alpha Reliability for Scales

Scale	α	# of Items	*M*	*SD*
Behavior	.47	2	2.17	0.76
Behavior intentions	.88	2	2.01	0.70
Attitude	.90	3	1.68	0.50
Ease of use	.88	2	1.65	0.50
Perceived usefulness	.89	4	1.78	0.42
Subjective norm	.91	4	1.86	0.46
Perceived behavior control	.73	2	1.80	0.43
Peer influence	.93	2	1.92	0.52
Facilitating conditions	.89	2	1.79	0.40
Self-efficacy	.92	3	1.70	0.43
Student influence	.90	2	1.98	0.47

Data Collection and Analysis

By coordinating with key members of the faculty at the targeted school via electronic mail and telephone, I explained the purpose of the survey and procedures to the administration at the selected community college. I crafted the survey using an electronic website SurveyMonkey, and the respondents were sent an invitation email that contained all necessary data, link to survey, and informed consent required by Walden University's

Institutional Review Board (see Appendix C). To ensure the anonymity of respondents, the researcher emailed the invitation to the schools faculty member for dissemination. The survey instrument was adapted from previous studies (Baylor & Ritchie 2002: Davis 1989; Taylor & Todd, 1995).

Statistical Analysis/Data Analysis

I employed path analysis models to develop factors that may influence behavioral intentions related to the use of Web 2.0 in the classroom, and given the multivariate context of the variables involved in the study to test relationships. Because a good model fit for the data was not found when conducting CFA to establish a good model, I reevaluated the research questions instead with linear regressions, more specifically, a Spearman Rho correlation. Using Spearman's rho still allowed for the ability to describe the relationships that the research questions sought to examine. The Spearman rho correlation is an appropriate analysis to establish a relationship between two variables (Tabachnick & Fidell, 2012). The Spearman's rho correlation does not assume the normality and homoscedasticity assumptions that the linear regression requires, and thus can be used as an alternative analysis when the assumptions were violated (Pallant, 2010).

Quality Control

I used measures to prevent harm to participants, including password protection on data files. The researcher used an informed consent form approved by Walden University under IRB number 01-11-13-0143157. All information was kept confidential and not disclosed to any party, including faculty, university administrators, or students. Student

information continues to be confidential and not revealed to the researcher; coordination with the student population is through Ms. Kerstin Brooks, Director of Student Life and Activities Services. All participants were emailed an invitation to participate in the survey; the email consisted of a consent form and website link to the survey (see Appendix D). These steps aided in maintaining internal an external validity of the research project.

Researcher Role and Disclosures

Although I have taken courses at the selected community college, I have no close relationships with any of the faculty at this time. Disclosure of the data outcome evaluation and resulting project were offered to the faculty and administrators of the Central Texas College distance-learning department when authorized by Walden University.

Data Evaluation

Confirmatory Factor Analysis

To assess the item scales, I conducted a CFA via a measurement model to test how well the data fit the item scales. The measurement model included: behavior (B), behavior intentions (INT), attitude (ATT), ease of use (EU), perceived usefulness (PU), subjective norm (SN), perceived behavior control (PCB), peer influence (PI), facilitating conditions (FC), self-efficacy (SE), and student influence (SI). Because multiple scales had less than four items (four items are needed to run a CFA for only one scale), all of the scales were evaluated together in a single measurement model. To have a good model fit, the chi-square statistic should not be significant, the comparative fit index (CFI) and

Tucker-Lewis Index (=Non-Normed Fit Index; TLI)should be above .90, and the RMSEA should be below .09 (Kline, 2011). The aforementioned scales and models indicating measures to determine a good fit model are defined by previous sources, such as, (Kline, 2011).

Results of the measurement model did not present a good model fit, $\chi^2(295) = 1007.95$, $p < .001$, CFI = .86, TLI = .82, RMSEA = .08. Modification indices were examined to assess how the model could be empirically improved. Correlations were added between ATT1 with AA2 and ATT3; PU3 with PU1 and PU2; SN1 with SN2, SN3, and SN4; and SE3 with SE1 and SE2. I conducted another test to evaluate the measurement model and the results still did not present a good model fit, $\chi^2(286) = 802.59$, $p < .001$, CFI = .90, TLI = .87, RMSEA = .09. Because I did not find a good model fit for the data, I evaluated the research questions next with linear regressions by averaging the items between each of the scales to create composite scores.

Revisiting the Research Questions

The research questions for this study are outlined below. The findings relate directly to these questions and the data evaluation was centered on these questions.

RQ1: How do students' attitudes towards using Web 2.0 applications relate to behavioral intentions of students?

RQ2: How do students' subjective norms relate to their use of Web 2.0?

RQ3: How does perceived behavioral control relate to the use of Web 2.0 applications by students?

RQ4: How does peer (other students) influence to use Web 2.0 applications affect

the subjective norms of students?

RQ5: How does self-efficacy of using Web 2.0 applications and the availability of resources and technology relate to perceived behavioral control of students?

RQ1: How do students' attitudes towards using Web 2.0 applications relate to the behavioral intentions of students? To examine research question 1, I conducted a simple linear regression attempting to predict if attitude was related to behavioral intention. Prior to analysis, the assumption of normality was assessed via a normality *p-p* scatterplot. The scatterplot revealed a strong deviation from normality and thus the assumption was not met. Therefore, the nonparametric Spearman rho correlation was conducted instead. The Spearman correlation does not make the same normality assumption that the simple linear regression makes (Pallant, 2010).

The results of the Spearman correlation were significant, $r_s(237) = .46$, $p < .001$, suggesting that a moderate, positive relationship existed between attitude and behavioral intentions (Cohen, 1988). As attitude increased, behavioral intentions also tended to increase. Because the Spearman correlation was significant, the null hypothesis can be rejected for the alternative hypothesis. Results of the correlation are presented in Table 4.

Table 4

Spearman Correlation between Attitude and Behavioral Intention

Variable	Behavioral intention
Attitude	.46**

Note. * $p < .05$. ** $p < .01$.

RQ2: How do students' subjective norm relate to their use of Web 2.0? To examine research question 2, I conducted a simple linear regression attempting to predict if a subjective norm was related to behavior. Prior to analysis, the assumption of normality was assessed via a normality *p-p* scatterplot. The scatterplot showed strong deviation from normality and thus the assumption was not met. Therefore, the nonparametric Spearman rho correlation was conducted instead. The Spearman correlation does not make the same normality assumption that the simple linear regression makes (Pallant, 2010).

The results of the Spearman correlation were significant, $r_s(237) = .23$, $p < .001$, suggesting that a small, positive relationship existed between subjective norm and behavior (Cohen, 1988). As subjective norm increased, behavior also tended to increase. Because the Spearman correlation was significant, the null hypothesis can be rejected in favor of the alternative hypothesis. Results of the correlation are presented in Table 5.

Table 5

Spearman Correlation Between Subjective Norm and Behavior

Variable	Behavior
Subjective norm	.23**

Note. * $p < .05$. ** $p < .01$.

RQ3: How does perceived behavior control relate to the use of Web 2.0 applications by students? To examine Research Question 3, I conducted a simple linear regression to predict if perceived behavior control was related to behavior. Prior to analysis, the assumption of normality was assessed via a normality *p-p* scatterplot. The

scatterplot showed strong deviation from normality and thus the assumption was not met. Therefore, the nonparametric Spearman rho correlation was conducted instead. The Spearman correlation does not make the same normality assumption that the simple linear regression makes (Pallant, 2010).

The results of the Spearman correlation were significant, r_s (237) = .07, p = <.001 suggesting there was no relationship between perceived behavior control and behavior. Because the Spearman correlation was not significant, the null hypothesis cannot be rejected in favor of the alternative hypothesis. Results of the correlation are presented in Table 6.

Table 6

Spearman Correlation Between Perceived Behavior Control and Behavioral Intention

Variable	Behavior
Perceived behavior control	.07**

Note. * p < .05. ** p < .01.

RQ4: How does peer (other students) influence to use Web 2.0 applications affect the subjective norms of students? To examine Research Question 4, I conducted a simple linear regression to predict if peer influence was related to subjective norm. Prior to analysis, the assumption of normality was assessed via a normality *p-p* scatterplot. The scatterplot showed strong deviation from normality and thus the assumption was not met. Therefore, the nonparametric Spearman rho correlation was conducted instead. The Spearman correlation does not make the same normality assumption that the simple linear regression makes (Pallant, 2010).

The results of the Spearman correlation were significant, $r_s(237) = .49$, $p < .001$, suggesting that a moderate, positive relationship existed between peer influence and subjective norm (Cohen, 1988). As peer influence increased, subjective norm also tended to increase. Because the Spearman correlation was significant, the null hypothesis can be rejected in favor of the alternative hypothesis. Results of the correlation are presented in Table 7.

Table 7

Spearman Correlation Between Peer Influence and Subjective Norm

Variable	Subjective norm
Peer influence	.49**

Note. * $p < .05$. ** $p < .01$.

RQ5: How does self-efficacy of using Web 2.0 applications and the availability of resources and technology relate to perceived behavioral control of students? To examine Research Question 5, I conducted a multiple linear regression to predict if self-efficacy and facilitating conditions was related to perceived behavioral control. Prior to analysis, the assumption of normality was assessed via a normality *p-p* scatterplot. The scatterplot showed strong deviation from normality and thus the assumption was not met. Therefore, the nonparametric Spearman rho correlation was conducted instead. The Spearman correlation does not make the same normality assumption that the simple linear regression makes (Pallant, 2010).

The results of the Spearman correlation were significant for self-efficacy, $r_s(237) = .30$, $p < .001$, and for facilitating conditions, $r_s(237) = .41$, $p < .001$, suggesting that

moderate, positive relationships existed between self-efficacy and facilitating conditions with perceived behavior control (Cohen, 1988). As self-efficacy and facilitating conditions increased, perceived behavior control also tended to increase. Because the Spearman correlations were significant, the null hypothesis can be rejected in favor of the alternative hypothesis. Results of the correlation are presented in Table 8.

Table 8

Spearman Correlation Between Self-Efficacy and Facilitating Conditions with Perceived Behavior Control

Variable	Perceived behavior control
Self-efficacy	.30**
Facilitating conditions	.41**

Note. * $p < .05$. ** $p < .01$.

Data Finding Conclusions

It appears from the data analyses that students perceive having a social network and its benefits may have the potential to improve student learning, student-student interaction, and student-faculty interaction. Additionally, the findings showed significant positive relationships between:

- attitude and behavioral intentions;
- subjective norms and behavior;
- peer influence and subjective norms;
- self-efficacy with facilitating conditions, and
- perceived behavior control.

On the other hand, there was no relationship between perceived behavior control and behavior.

The survey used did not support constructing a path analysis model because multiple scales had less than four items needed to run a CFA. Therefore, I examined relationships between constructs using a Spearman rho correlation (Cohen, 1988). Although I chose a nonparametric statistical model to show relationships, the results still pointed to students understanding of the benefits for using Web 2.0 technologies for educational purposes.

Conclusion

The Spearman rho correlation increased the ability to show relationships between constructs, and this was due to an insufficient number of items comprising each construct for linear regression analysis. Employing Cronbach's alpha I was able to show reliability of the data collected from the survey. Data were evaluated using several measurement models, confirmatory factor analysis for path analysis, linear regression, and Spearman rho correlation. Spearman rho was used for final analysis because the results from the other models did not present a good model fit. The quantitative results revealed a positive relationship between constructs and supports the fact that students are aware of the educational benefits of Web 2.0 to supplement in-class learning. The results also provided a better understanding of the factors that influence students' decision to adopt these tools.

Understanding what technologies students use, and how they use it for educational purposes will better support the allocation of resources, support faculty

aspirations for technology growth, and support student success. The findings of this study are important because they represent an important link between social science, technology, and other academic disciplines. As facilitating conditions increase and support of providing a more technology based learning environment, students need and desire to use more robust technological based learning tools will increase. Their interest in new technologies will affect how the learning environment is designed and how students and faculty interact with each other. Current academic disciplines that still rely on in class within a brick and mortar structure should start to consider how to best implement a hybrid or blended learning environment. More importantly, these findings support changes that will occur in regards to technological advances in years to come. Institutions can refer to the data and its findings to determine in general what students understand about Web 2.0 technologies and students propensity to use this technology in academic setting.

Some of the implications that are addressed in Section 3 are how social media plays a key role in the college student's educational experience, and determining how to incorporate social media effectively into academic matters and student learning. Section 3 presents possible solutions informed by the research findings.

Section 3: The Project

Introduction

In this section, I discuss how a descriptive survey was used to examine student awareness of the educational benefits of Web 2.0 to supplement in-class learning, and better to understand factors that influence student decisions to adopt these tools. This section outlines procedures I used in the collection and analysis of data related to this study. This section includes a thorough literature review linking current research to the findings of this project study, and linking current findings to inform policy recommendations. This section concludes with an overview of the project findings and how they are embedded in the project deliverables and my reflection of how the development of this project influenced me as a future scholar-practitioner.

The study was designed to determine if a relationship existed between constructs. If the relationships were not negligible, this would have suggested that students did not understand the educational benefits of social network applications. I also use the results of this study to reveal how the factors that influence students' decision to adopt these tools are substantial, and the method used to determine relationships between the constructs.

The development of this project was not the work of a single researcher, but was made possible with the data provided by the students in the distance-learning courses and faculty of the computer science department. Using this research design helped to determine students’ awareness of the educational benefits of Web 2.0 to supplement in-

class learning, and better to understand factors that influence student decisions to adopt these tools (Ajjan & Hartshorne, 2009).

I employed a descriptive survey in this study to examine student awareness of the educational benefits of Web 2.0 to supplement in-class learning. I also wanted to understand factors that influence student decisions to adopt these tools. For the purpose of this study, Web 2.0 technologies are comprised of applications that provide a social writing platform for collaborations among those in a group or of similar interests. In these findings, I identified university students' awareness of the benefits of using Web 2.0 technologies to supplement traditional classroom instruction and determine the factors that influence student decisions to adopt Web 2.0 technologies in the educational arena.

Researchers have documented that social networking sites may provide a forum for extending the traditional classroom and provide a technological space for groups that have similar educational interest and needs (Ajjan & Harthshorne, 2008). The findings I collected and evaluated in this project study aligned with prior research findings.

Description and Goals

This descriptive survey revealed a positive relationship between constructs while providing a better understanding of factors that influence students' decisions to adopt Web 2.0 applications for academic purposes. I initially used the findings from the survey to conduct a path analysis to determine the relationship between the constructs, but the review did not support building a path analysis model. I used Spearman rho correlations to increase the ability to show relationships between constructs. The final results revealed

a positive relationship between constructs and supported the conclusion that students are aware of the educational benefits of Web 2.0 to supplement in-class learning.

The goals of this study were to examine students' actual use and their awareness of the educational benefits of Web 2.0 applications in a community college in central Texas (CCCT), and to understand the factors that influence student decisions to adopt these tools. Furthermore, this project provided added data to help fill the knowledge gap between how students use SNTs in their personal lives and how SNTs are used to supplement learning in the classroom.

Rationale

This project study and methodology selected were a good match for determining the impact of specific variables on actual behavior and the relationships among specific variables. I discussed the factors that influence students' decision to adopt social networking with the study site's Chancellor of Distance Learning to receive permission to conduct this study. I proposed this project as an outcome of the data analyzed in Section 2, which indicated that students perceive social networks as having educational benefits, and its benefits may have the potential to improve student learning, student-student interaction, and student-faculty interaction. Additionally, my findings show significant positive relationships between attitude and behavioral intentions; subjective norms and behavior; peer influence and subjective norms; self-efficacy with facilitating conditions and perceived behavior control. This evidence supported my policy recommendations for technology implementation and change, and will thus support innovation in the learning

environment. This genre was chosen because it supports providing information to connect evidence to recommendations.

Furthermore, although the survey used did not support constructing a path analysis model because multiple scales had less than four items needed to run a CFA, using a Spearman rho correlation allowed me to use the data to show relationships. Although I used a nonparametric statistical model, this model still suggested that students understand the benefits of using Web 2.0 technologies for educational purposes. Another desirable trait of using Spearman rho is that the statistic indicates the significance of the data's relationship regardless of the number of data sets available to determine such significance.

Because I was investigating what students' thought about Web 2.0 tools, I needed the quantitative results to provide statistical evidence to measure the relationship between constructs. The quantitative data revealed if students use of Web 2.0 applications for learning may have a possible positive effect on their behavior in the learning environment. The results of the survey provide a solid reference point from which the administration at CCCT can build a more responsive social network infrastructure.

The project study grew out of the need to address a knowledge gap between the way in which students' use Social Networking Tools, also referred to as Web 2.0, in their personal lives and how they are used to supplement learning in the classroom. More specifically, I wanted to explore if students were aware of how these tools could intersect with and be used to enhance the learning environment. The questions used to address this need were best addressed by providing evidence that students perceive having a social

network, and its benefits may have the potential to improve student learning. Moreover, I wanted to understand if there was a positive relationship in regards to students' attitudes towards using these tools to supplement learning. The findings did not indicate any relationship between perceived behavior control and behavior, but did indicate significant relationships between the other variable comparisons.

Review of the Literature

The literature search for this study identified ample research on the use of Web 2.0 technologies as it related to students' understanding of the learning application of these tools (e.g., An & Williams, 2010; Brady et al., 2010; Campion et al., 2012; Greenhow et al., 2009; Madhusudhan, 2012; Pestek et al., 2012; Su & Beaumont, 2010). In this study, I used the research method based on theories of planned behavior (Chennamaneni et al., 2012; Lee et al. 2011; Pelling & White, 2009; Sadaf et al., 2013; Suryaningrum, 2012; Venter, Rensburg, & Davis, 2012; Wilson, 2010). The research supported the purpose of this project by providing empirical evidence on the educational usability of Web 2.0 tools. Furthermore, the research supports how technology affects college students, their readiness to use Web 2.0, and how technology is reshaping the current learning environment (Bubas et al., 2010; Goode, 2010; Jones et al., 2010; Kolikant, 2010; Krishnakumar & Kumar, 2011; Martin & Noakes, 2012; Oliver, 2010; Yauri, Salam, Rahim, & Bte Kahar, 2016).

I believe a stronger research focus on students' everyday use of Web 2.0 technologies and their learning with Web 2.0 both in and outside of the classroom is needed. Pestek et al. (2012) presented evidence that Web 2.0 usage in higher education

has an emerging role in transforming the learning environment, and students have embraced this technology actively using it daily inside and outside of the learning environment. Web 2.0 technologies offer hybrid learning spaces that allow learners to have more choices on how to and where to spend their learning time, such as, online settings, public spaces, or at home (Greenhow et al., 2009). Greenhow et al. (2009) implied that Web 2.0 has affected the constructs of learning and instruction. Campion et al. (2012) stated that "it is important to craft new learning environments focused on students' interests that enable learners to remain receptive to the conceptual, scientific and technological changes that will continuously appear throughout their job activity" (p. 116). Student acceptance of using this technology is a significant factor in students' future use of this technology in the learning environment. Learners and consumers who have "grown up digital" will expect organized education systems that provide a diverse means of access and service (Wilson, 2010).

Web 2.0 enables college students to become creators of knowledge and create content instead of just listening to lectures, as well as encourages them to take responsibility for their learning (An & Williams, 2010). According to Su and Beaumont (2010), social networking tools or Web 2.0 can encourage active collaborative learning and confidence, informative versus subjective self and peer assessment by enabling rapid feedback, indirect learning through observing others' contributions while enabling tracking of student learning. Brady et al. (2010) determined that there was little research detailing the educational benefits associated with the use of social networking sites themselves. For this reason, the investigation to the use of alternative social networking

sites in higher education resulted in the benefits of social networking in education. The results suggest that education-based SNSs can be used most effectively in distance learning courses as a technological tool for improved online communications among students in higher distance education courses. Tilfarlioglu (2011), An & Williams (2010), Campion et al. (2012), Pestek et al. (2012), Su and Beaumont (2010), Tess (2013), and Toetenel (2014) have all specifically linked students' understanding and acceptance of using Web 2.0 technologies in the learning environment with the educational benefits of Web 2.0.

Suryaningrum (2012) identified user behavior and task-technology-fit as the best indicators to use to show a relationship between the adoption of information technology and individual performance. Suryaningrum (2012) examined how individuals adopted information technology, finding that DTPB was too complicated due to the concept of *fit* used to investigate the interaction of task and the effects of information system usage and the task performed. Suryaningrum also discovered that DTPB had its advantages over other acceptance models in that it identifies specific popular beliefs that may influence information technology usage. Other advantages that Suryaningrum found where that by decomposing beliefs, the relationship between belief and the antecedents of intention should become clearer and more readily understood. However, Chennamaneni et al. (2012) highlighted that the DTPB model decomposed behavioral, normative and perceived control belief structures into multidimensional constructs, which result in providing higher explanatory power and a more precise understanding of the antecedents of behavior.

When the project started, I believed that the survey used provided enough constructs needed to show a good fit required to conduct path analysis. I developed the survey based on the DTPB model. However, during the validity and reliability stage of the project, I needed to modify the survey producing a survey with not enough variables needed to produce a good fit model for path analysis. To evaluate the research questions, I used linear regression, more specifically, the nonparametric Spearman rho correlation because it does not make the same normality assumption that the simple linear regression requires (Hasegawa, Yasuoka, Ly, Nguon, & Jima 2013; Pallant, 2010). Furthermore, I was still able to show relationships between constructs using the Spearman rho correlation, keeping within the theory of DTPB. Lee et al. (2011) used an extended model of the technology acceptance models (TAM) and suggested that extending the model for acceptance of technology is less complex than DTPB. Furthermore, Lee et al. (2011) found that combining innovation diffusion theory (IDT) with (TAM) provides an innovation perspective along with the intentions or beliefs towards acceptance. A combination of IDT with the acceptance model (TAM) provides a further understanding of possible perceptions about e-learning systems, thus providing better overall results of a study (Tam, Lam & Fung, 2014; Tam, Lam & Fung, 2012).

Sadaf et al. (2013) used the same theoretical premise using DTPB to explore preservice teachers' intentions to use Web 2.0 technologies in a mixed-methods research design. They employed a convergence triangular mixed-methods design, in which they collected different but complementary data to validate and expand quantitative results with qualitative data, the result was data used to explain further factors related to DTPB.

These results highlighted the connection between this project and DTPB based on the discovery of using certain research methods to arrive at determining relationships between constructs.

Abbad's (2010) research using the technology acceptance model identified some of the factors that affect students' intentions to adopt e-learning systems. Abbad determined that external factors (subjective norms, self-efficacy, perceived usefulness, and perceived ease of use) indirectly influence the acceptance of technology through perceived usefulness and ease of use. Without incorporating external factors, the TAM provides only very general information on users opinions about the technology. The research that was done in the past highlights the connection between the using the theory of planned behavior to predict the performance of a wide range of behaviors, including those involving technology. Pelling and White (2009) agreed that TPB and DTPB are based on sound theory and included this theory in determining young peoples' use of social networking websites. Their study revealed that leading social networking websites use was influenced by attitudinal, normative, and self-identity factors. Therefore, supporting the theme that DTPB is an excellent research theory to determine factors that predict intentions to use Web 2.0 technologies.

Researchers have made a compelling argument for integrating Web 2.0 across curriculums within the learning environment. Martin and Noakes (2012) had identified how to foster a Web 2.0 ethos in a traditional e-learning environment. They contended that within the pedagogy of Web 2.0, it provides flexibility, “student-centeredness,” and from an early stage, opportunities for students to be responsible for their learning.

Balnnin (2015), Martin and Noakes (2012), and Mbatha (2013) supported the need to investigate whether learners are fully aware of the educational benefits of Web 2.0. Furthermore, their research asserted that the teachers' role would require some amount of digital literacy, particular in e-learning and how knowledge is created and shared through Web 2.0 tools.

Oliver (2010) supported the same assumptions, recommending that the Web 2.0 technologies be integrated across the curriculum for Science, English-Language Arts, Mathematics, Social Studies, Physical Education and Health, and several other learning content areas. Oliver's premise was to show how implementing Web 2.0 subject content area tools benefits outweigh the challenges of not implementing them. The current generation of students bring a new set of challenges to the community college; these individuals interact through Web 2.0 technology. Bajt (2011) and Dowling (2011) similarly stated that these students' expectations are already reshaping how institutions of higher learning provide learning experiences.

Kolikant's (2010) research differed in that he discovered that students' did not feel empowered with respect to learning because of their familiarity with the access to Web 2.0 tools or the Internet. The majority in Kolikant's study believed that the Internet oversimplified schoolwork, which in turn diminished learning abilities. Kolikant (2010) and DiLullo, McGee & Kriebel (2011) was concerned that the results carry important implications regarding school, given the low self-efficacy might make students less likely to apply themselves to learning. Krishnakumar and Kumar (2011) and Patel and Patel (2012) had identified similar issues and suggested that measuring attitude and effort to

improve attitudes towards technology is essential to effect any change in regards to positive outcomes using technology in the learning environment.

Huang's (2010) findings provide insight on how to develop online learning courses that meet the requirements for a robust online course delivery platform. This resource can assist in developing courseware through a Web 2.0 delivery platform that supports students' self-efficacy by providing in-depth, informative learning. Goode (2010) and Jones et al. (2010) also supported how technology knowledge impacts students entering college. Goode (2010) researched how college students are immersed in the ubiquitous world of technology on almost every university campus. Students are required to manage their course enrollments online, apply for financial aid online and read general announcement online. Knowing how to utilize the technological ecosystem of university life is critical for academic success, therefore, understanding how students' view technology in the learning environment is paramount to eradicate a perceived digital divide (Goode, 2010; Wang, Sundaram, 2013; Ng, 2012). Jones et al. (2010) research supported the same theme of this project based on data in regards to the technological aptitude of the "Net Generation" or "Digital Natives" entering into university today. Jones's research concludes that there is no significant difference in the variation among students that lie within the Net generation age band, which support my project's theme that technology is impacting the current learning environment in general. Thompson (2013) offers that "digital natives" are given a set of learning habits and behaviors based on an assumption that immersion in technology during their life affects the way the think and learn. Moreover, the term digital native may no longer have universal applicability.

Instead, it may be more relevant to use the concept of digital wisdom or knowledge (Gallardo-Echenique, Marques-Molias, Bullen, & Strijbos, 2015). Finally, the literature directly supported the theoretical framework and approach that I used to complete this project.

Implementation

The Chancellor of Distance Learning, and advising staff on information technology management will base the project implementation on the opinions of the findings. The success will be determined through the program evaluation. Any impromptu implementation of using Web 2.0 technologies for academic purposes based on the results of this study would benefit from additional evaluation. I have already been made aware that the Information Technology Improvement Committee meets once every quarter, so at the next meeting, I will recommend an implementation timeline. The timeline will show milestones to be completed and should take about 2 to 3 academic quarters to implement.

I will prepare a PowerPoint presentation to inform the school board or advising staff on the outcome of the study. The presentation will inform stakeholders of the relationship between students understanding of Web 2.0 technologies and their propensity to use the technology for academic purposes. The structure of the PowerPoint presentation includes an executive summary and introduction, methodology, results, discussion, recommendations, and references.

In regards to implementation, I will recommend to first analyzed current technology that is in place in regards to social networking connectivity and applications,

and develop alternative social networking sites specifically designed for the higher education setting. Also, since faculty will be the drivers of successful integration of technology into the classroom, faculty will receive explicit directions from the Information Technology department on how to assist and monitor students progress in using the new systems. I plan to present my recommendations to the Chancellor of Distance Learning, assigned faculty leaders, and Information Technology Committee and work towards facilitating further action.

Another key factor in presenting the results of the study's findings is to be transparent about study's limitations and shortcomings. Therefore, limitations of the study were included in the discussion section.

Potential Resources and Existing Supports

Resource requirements include funds for purchasing existing social networking sites specifically designed for the higher education setting. Depending on how restricted the institutions budget may be, recommendations for implementing no-cost Web 2.0 based higher education curriculum will be the chosen resource. The Chief Academic Officer, Chancellor for Distance Learning, and Information Technology Officer must first champion the project, and faculty members must support implementation. Although there is existing support for the advancement of technology at this institution, a dedicated SNT Officer needs to be assigned to manage the policy implementation process, preferably a staff member on the Information Technology Committee. This recommendation is not to add a new staff position but a suggestion to add a collateral duty to existing staff duties.

The SNT Officer will report to the head of the Information Technology Committee, and the Chancellor of Distance Learning.

Potential Barriers

Potential barriers center on having limited support once presented at the quarterly Information Technology Board. Secondly, the college board of directors must also support this endeavor. Also, the infrastructure to include computer access and hardware (laptops, desktops, electronic notepads with Wi-Fi) must be in place to support the Web 2.0 learning environment. Development of a technology helpdesk will also need to be implemented or broadened to handle assisting students who may experience technical issues. The data analysis and evaluation of RQ5 provided evidence that as students' self-efficacy of using Web 2.0 applications increase facilitating conditions increase. In response to the data provided by RQ5, departmental leadership and faculty should be supportive in making sure good facilitating conditions are in place during the implementation phase.

Proposal for Implementation and Timetable

Because of the timeline for completion of my doctoral project, this new technology cannot be adequately implemented until the fall semester of 2016. Design and pilot implementation may start as early as summer semester of 2016. The success of this project also depends on the acceptance of the need by the chancellor of distance learning, and faculty members of the college.

Roles and Responsibilities of Student and Others

The roles and responsibilities of school leadership will determine what courses will be migrated to Web 2.0 and how many of the courses will be hybrid. Hybrid courses provide an alternative method to online or traditional college courses by providing education through a mix of online and campus-based course instruction. Leadership will also have to determine what changes to policies affecting technology use was made. Faculty roles and responsibilities will contribute to the design requirements of the Web 2.0 or social networking site, along with supporting its implementation. Students must commit to following the policy associated with the change this new technology practice brings and avoid the desire to modify the technology for casual use. Since this technology will be vulnerable to outside malicious attacks, it is imperative that anyone who has access to an institutional Web 2.0 application adhere to the rules associated with it.

Project Evaluation

I will use the outcomes-based method to evaluate the implementation of SNT as a learning tool based on the findings from my study. The best way to determine if the college used the data to move forward in making improvements in technology is to conduct an outcomes evaluation of technologies. It will have to be performed within a specific timeline to ensure full implementation and effective evaluation. I recommend this inquiry be conducted within two years focusing on implementation and usefulness of the Web 2.0 tools used.

This approach is justified because it will provide data to show the implementation of discussed technologies and tools. This way, it will be the least intrusive, taking into

consideration the importance of students' and faculty time and privacy as it relates to academia. The outcome and performance measures will be "do Web 2.0 technologies exist" "how useful are the Web 2.0 tools used" and "are students and faculty accepting of Web 2.0 tools used."

The overall evaluation goals are to see if the data was sufficient enough to convince the college to include Web 2.0 in its technology improvement plan while implementing the change. The key stakeholders are Chief Academic Advisor, Chancellor of Distance Learning, faculty members, and students in distance learning programs.

Implications Including Social Change

Local Community

This research promotes positive social change through an increased awareness of factors affecting Web 2.0 adoption, use, and how Web 2.0 can be used in the learning environment. The finding from this study has several implications for positive social change, which includes the use of Web 2.0 tools to stimulate active learning and collaborative learning environment in and out of the college classroom. The results of the survey indicated that students agreed that using Web 2.0 tools would improve their instructional performance for their classes. All the responses were good indicators of future use. Based on my findings, the college should shift its focus from a traditional in-classroom approach to teaching to either a hybrid of technology and in-class room teaching or a more flexible interactive Internet and Web 2.0 learning environment.

Far-Reaching

Institutions using Web 2.0 technologies can benefit from using the findings provided by this study to address a possible knowledge gap on how students are using Web 2.0 applications socially, and students' awareness of the educational benefits of Web 2.0 technology. This project also addressed the complex, diverse and contentious themes related to social networking in higher education, specifically using social networking for educational purposes. To inform other institutions on how to integrate Web 2.0 technologies, it is important to explore the students' actual use and awareness of the potential of Web 2.0 technologies to supplement future classroom learning.

Conclusion

The findings from the study supported that there is a positive relationship in regards to students' perceived understanding of the benefits of Web 2.0 as a learning tool. This study captured empirical data and formulated research that supported the research design and research questions that I thought were relevant to determining whether or not students understood if Web 2.0 tools could be used to supplement the learning environment. I wanted to mitigate my qualitative bias and view the problem through the objective lens of quantitative research and analysis.

The more significant finding from this research was the validation that there was no relationship between perceived behavior control and behavior. This finding was offset by the data suggesting that students perceive having a social network offers benefits that may have the potential to improve learning, student-student interaction, and student-faculty interaction. Additionally, the research supported that the theoretical basis along

with the research design provides a strong framework in regards to what the study was trying to achieve. In the context of the theoretical framework, students' understanding of the pervasiveness of Web 2.0 tools gives it the appearance of a set of applications that was used for consumption and production of data. In section 4, I will reflect on the project's strengths and weaknesses, and recommend ways to address challenges encountered during this research process, along with what I have learned about my doctoral project process.

Section 4: Reflections and Conclusions

Introduction

This section contains a reflection of my project and doctoral journey. In it, I discuss the project strengths, limitations, my journey as a scholar-practitioner, and then reflect upon myself as a project developer and scholar and the implications that this project has for social change. This section ends with my conclusions of the journey as a whole: where I began academically and where and the direction headed. I discuss my personal evolution of becoming a doctor of education, the implications of having a doctorate in education, and how I can touch others in my life through my research and scholarship.

Project Strengths

This project study directly addressed the knowledge gap between how students are using Web 2.0 applications socially, and the students' awareness of the educational benefits of Web 2.0 technology at a local community college. The integration of data provided by both students and faculty enhances and strengthens the value of this project. Initially, the proposed model turned out to be unsuitable for determining if relationships existed between constructs, which would have been used to answer the research questions. After processing the data collected from the surveys through several parametric and nonparametric statistical models, I was able to reveal that students understand the benefits for using Web 2.0 technologies for education purposes.

The project's strength in addressing the problem is best illustrated through the answers to the research questions, which provided evidence that students perceived

having a social network, and its benefits may have the potential to improve student learning. Another project strength in addressing the problem was that the quantitative data revealed that students use of Web 2.0 applications for learning could have a positive effect on their behavior in the classroom environment. The results of the survey provided baseline measure from which the administration at CCCT can build a more responsive social network infrastructure.

Recommendations for Remediation of Limitations

The limitations of this project center on faculty participation and school administrators support of implementing a more robust social networking infrastructure at the institution. Other limitations center on having limited support once presented at the quarterly Information Technology Board. Secondly, the college board of directors must also support this endeavor. Also, the infrastructure to include computer access and hardware (laptops, desktops, and electronic notepads with Wi-Fi) must be in place to support a Web 2.0 learning environment.

I recommend the college should implement the program in manageable parts. Also, I suggest requesting the assistance from students who are participating in information system programs that focus on innovative adaptations of systems to improve communication and learning.

A technology helpdesk will also need to be developed and implemented or broadened to handle assisting students who may experience technical issues. I have assumed that departmental leadership and faculty will support the extent of technological advances, and they may not be fully supportive towards full implementation.

Some alternatives may be considered to address the support and implementation issues of this project:

1. It imperative to identify the champions for the project, everyone who is a decision maker in regards to project implementation should agree that there is a need for implementing social networking as an educational tool. They should also agree that the plan was implemented incrementally.
2. Choose a team to establish and mandate advising sessions for faculty and students. The agenda for the session will be specific and innovative and outline information technology project management task.

Scholarship

What I learned about scholarship is that postgraduate work gives you the experience to enjoy scholarly activities at the highest level. When completing my master's degree in management, I was required to complete a thesis that offered an opinion and premise that was proven. Scholarship in this project required that I analyze data and report the findings without bias, but by providing reason supported by the study's conclusions on the guiding research questions. I also realized that research that I have done in the past was results driven based on information already available. The data I collected during this research project provided the results needed to answer research questions that where formulated based on a potential need or perceived problem.

Another learning point was that all scholarship is not applied equally across different academic fields. Research that I have completed in the past did not necessarily add new knowledge in a particular field of study or interest. Furthermore, it did not focus

on solving a local problem. While conducting this project study I have gained more insight to how conducting a study will result in a manuscript containing new knowledge that will add understanding of higher education and administrative practices.

Project Development and Evaluation

I felt that I had a great responsibility to inform the Chancellor of Distance Learning and related stakeholders on the possible future expectations of students' and faculty in regards to technology used to enhance the learning environment. It was expected that this study would produce a viable product for institution leaders to use to predict and plan future improvements within their technology infrastructure. Therefore, I felt a sense of absolute responsibility for providing a scholarly deliverable that was informative based on the findings that were a reflection of the data received.

The actual project development was not difficult, but was challenging because of the extensive review of professional literature conducted at the end of the project due to the initial review of literature not meeting the five-year requirement. This updated review of literature provided me with an enhanced understanding related to Web 2.0 and its educational use. Furthermore, the development of this project was unique because of the challenge in defending the data analysis tool used for interpreting the data of the project. The data analysis tool was changed several times because of the appropriateness or "fit" of the data to perform a valid path analysis. Once I explain the reason for the change in using Spearman's Rho rather than using path analysis, it will be apparent why the data analysis tool chosen was used.

The evaluation of the project will start as the leaders at the college make decisions regarding implementation. Once implemented, its effectiveness can be continually tracked by student satisfaction surveys, and periodic evaluation of institutional technology needs based on the findings of this project. Lastly, all data gathered in regards to this project should be synthesized to support future decisions for technology innovation.

Leadership and Change

Individuals who earn doctorate degrees should be able to lead others at lower academic levels, whether it is through mentoring or advising other scholars through the academic research process. Conceptualizing, conducting, and completing this study demonstrated that I could fulfill the responsibilities of many leadership roles in education. Students, faculty members, and peers who are active members in researching and finding solutions will be treated as leaders of their particular area. Furthermore, they should feel responsible for adding new information to their chosen field of study.

My reason for completing a doctorate in education and not pursuing a PhD in education was that I wanted to focus mainly on education administration. After completing 25 years of military service, I underwent a transformation going from being an administrator based on experience to becoming an administrator based on scholarly achievement and experience. I have experienced significant growth in this doctoral journey, which has provided me the foundational structure of mentorship and a driving force for becoming a credentialed expert in my field.

Analysis of Self as Scholar

What I learned about myself, as a scholar is that I can achieve higher levels of scholarship when focused, motivated, and determined to solve a particular educational problem. I believe there are no limitations to what I can do and as a scholar, I have the opportunity to increase my awareness and knowledge through learning. Confidence in completing this project was always positive; the time, dedication, and support needed to complete this project were the most challenging aspects for me as a scholar.

However, after completed a project of this magnitude, I now have the tools and experience needed if I do seek to conduct research. As a scholar, the most important part of this study was learning what parametric, and nonparametric tools where and how to differentiate how and why which one is used. Furthermore, as a practicing scholar, leading others or motivating others to complete their terminal degree will continue to help me grow as a scholar-practitioner.

Analysis of Self as Practitioner

I have always considered myself a scholar-practitioner before completing this study. I understood the merits of being a practitioner but did not fully understand the rigor that was involved in fulfilling that responsibility. This lack of appreciation is due to my academic career up to this point. I was focused on being a practitioner, and it was how I saw my role as educator and not as a researcher.

At the beginning of my doctoral journey, past efforts as a practitioner were rather rudimentary, in regards to how the term practitioner was used in this research project. The research conducted for this project enabled me to learn and practice multiple

approaches that became secondary after the data collection process was completed, and the data analysis tools were applied. In the past, as a practitioner tools were used to collect and analyze the data but the focus was on obtaining the data, and not on evaluation of the goodness of fit based on selected data analyses and research questions. Educators have historically implemented theories more than they have measured the outcomes from applying theories. The basic principals that I have learned about the difference between being a practitioner in the past and a practitioner today are that I have learned more specialized skills in the use of statistical analysis tools and research methods. For example, in prior studies that I have conducted, I used simple probability to determine favorable and possible outcomes. In this study, I used sophisticated statistical tools to reveal relationships between variables that may explain favorable or unfavorable outcomes.

After completing this research project, I now consider myself a well-rounded scholar-practitioner. I can make a greater impact in my field of expertise as an independent and collaborative practitioner dealing with education-centered issues. I used scientifically sound approaches to evaluate matters in the education arena and developed a plan of action to adjust any additional conditions that may be the cause. Understanding how to use statistical analysis tools and research methods is what I believe a practitioner's responsibility is, and having conducted this independent research study, I can now fulfill this responsibility.

Analysis of Self as Project Developer

As a project developer, I have learned that I can produce a scholarly project with deliverables that meet the requirements for a scholar-practitioner. I can also thoroughly determine a problem, perform scholarly research to inform others of existing knowledge gaps that have caused the problem, and deliver a final, conclusive document to drive the course of action to alleviate the problem. In this study, I identified a possible knowledge gap in the use of Web 2.0 or Social Networking Technology applications use in the academic setting, and if students had any desire to use such tools in the learning environment. I performed scholarly research and collected data used to further investigate whether there was a relationship in variables to support addressing the knowledge gap, and prepared deliverables to inform stakeholders of my findings.

As a project developer, I have also gained the confidence as a researcher capable of developing useful research that could impact an institution. Above all, with this experience, I have also realized the tremendous responsibility that comes with this expertise. My critical analysis of myself as a project developer is that I have adhered to a strict timeline. Although the education program that I am in gives flexibility in regards to timelines, I should have treated timeliness as that of deliverables for remuneration while completing this doctoral project. As I continue to practice being a researcher and project developer, and my competence becomes honed to that of second nature, I will monitor complacency and improve the timeliness of deliverables.

The Project's Potential Impact on Social Change

This project has significant capacity for social change. My study has the potential to improve the outcomes of decisions being made at all learning institutions if Web learning platforms should be used. More value will be placed on the utilization of the Web 2.0 tools to act as an important platform to stimulate active learning. The findings from the survey indicated that an overwhelming majority of students and faculty were aware of the educational application of Web 2.0, and that Web 2.0 tools are either currently being used or recommended for utilization in the future. All responses to the survey also provided useful indicators of future use, which means that academic institutions will either gravitate from traditional approaches to teaching in a Web 2.0 based environment or, at a minimum create e-learning hybrid courses that use Web 2.0 applications to enhance the learning environment.

Furthermore, this shift would prepare the learner for the always-emerging global changes being made in the educational arena in regards to technology. For example, the formal learning environment has always been engaged in discussions on the need to make changes to offer access to anyone who has the desire to learn. Implementing Web 2.0 applications would further expand access to learning, and in regards to social change, allow for organic growth and use of the technology.

Social change is constantly evolving in education through technology. For example, an open and closed educational space called EDUSPACE is an evermore present Internet resource. Most of these technology–driven education spaces have been developed in other countries to offer education to those who desire a more open none

traditional approach to learning. By implementing Web 2.0 technologies, we are in fact participating in the current social change efforts related directly to education.

Educators have seen the need to innovate and move from what seems to be a inflexible way of delivering instruction while in a brick and mortar classroom, to a highly flexible and interactive use of the Internet and use of Web tools. In the past, there were challenges, such as Internet connectivity and access, having computers, and having a robust and effective technology use policy in place. However, the availability of Internet access, basic skills and knowledge required to take full advantage of Web learning platforms, and the efficient use of this technology to enhance learning, has become a standard component in the classroom environment throughout the learning spectrum (Enonbun, 2010). Web 2.0 tools along with newer Web-based learning platforms are being used to facilitate knowledge systems powered by students. This techonolgy–driven education change means that learning is being optimized socially and globally.

Implications, Applications, and Directions for Future Research

The findings of this project demonstrated that students perceive having a social network, and its benefits may have the potential to improve student learning. The importance of the work and what was learned in this project will reflect how Web 2.0 tools stimulate active learning and collaborative learning environments in and outside of the classroom. Moreover, Web 2.0 tools should be included in the curriculum to prepare and competitively position the average learner for the future. The traditional boundaries of the classroom should be replaced by the boundless opportunities to learn via Web learning tools.

Professionals in the field of education can utilize this research as a tool to support decisions being made whether or not funding or resources should be prioritized to improve their current technological situation. Furthermore, educators' perceptions and beliefs have shifted focus on content acceptance to the process of content sharing, creation, and mashing teacher attitudes towards Web 2.0 tools that transpose to online learning activities (Naldeson et al., 2012).

The directions for future research will go beyond hybrid and face-to-face interaction with the online teachers' learning-centric environment. Web 2.0 technologies, and the emerging Web-based learning platforms provide a set of social values and positively aid networks of learning. Social cognition has changed its form; communication via technology has become more exact and succinct. In some cases, if one adds too much information in writing communication, those ideas can easily become misconstrued. Therefore, the future direction for further research may focus on how to monitor a Web-based learning environment effectively for basic academic skills and knowledge required in a given subject.

Conclusion

This section provided a reflection of my doctoral process. Technology that can either improve or innovate the learning process has always been an interest of mine, but I have experienced the rigors in exercising that interest throughout the EdD experience. The strength of my project study was addressing the knowledge gap that I initially identified. However, as I discussed the scholarship of my experience, the real scholarship

was when I had to change my data analysis tool from a path analysis model to a nonparametric statistical model.

Through the process of conducting this study, I found that as a scholar I can achieve higher levels of scholarship and that a project of this complexity requires constant dedication and perseverance. As a practitioner and project developer, I have gained greater competence as a scholar-practitioner. The challenge is keeping an open mind and focusing on how the implications of the study will affect future research.

Social change has been one of my personal endeavors since retiring from the service in 2013. I have embraced Walden University's mission of conducting useful academic work and how the work should have positive implications in regards to social change. Conducting this study has been a long journey, but I found it very rewarding. I hope to become a mentor to other doctoral students who seek to earn terminal degrees in the future.

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Appendix A: Final Report for Students' Readiness to Use Web 2.0 Technologies in Online Education

Introduction Including Background of Existing Problem

Web 2.0 technologies offer many educational benefits in higher education. The leaders of the community college selected for this study desired to explore students' familiarity with the educational benefits of Web 2.0 tools before investing in technology upgrades for the college. The purpose of this quantitative descriptive survey research was to explore student readiness to use Web 2.0 technologies in their higher education, distance learning experience. Specifically, the research questions were designed to clarify students' attitudes and behavioral intentions towards using Web 2.0 applications. Additionally, a secondary goal is to understand the factors that influence student decisions to adopt these tools. The theoretical framework will be the decomposed theory of planned behavior (DTPB) based on the theory of planned behavior (TPB) proposed by Ajzen (1985). A key element of TPB is that individuals' actions are a function of behavioral intention that in turn is a function of attitude, subjective norms, and perceived behavioral control (Ajzen, 1991). In order to better understand the impact of specific variables on actual behavior and the relationships among these variables, attitude, subjective norms, and perceived behavioral control will be decomposed into lower level belief constructs (Taylor & Todd, 1995).

TPB predicts intention and in turn behavior, and DTPB is a more extended model of TPB used to better understand specific determinants of computer usage intentions and behaviors. According to Taylor and Todd (1995), DTPB has stronger explanatory power

compared to the original TPB and will be used to help explain factors leading to students' adoption and use of Web 2.0 applications to support in-class learning. Research specific to technology use in higher education also use the technology acceptance model (TAM; Davis, 1989; 1993) along with the theory of planned behavior, and the decomposed theory of planned behavior. TAM predicts use acceptance of technology.

Evidence From the Literature

This study may provide a compelling body of evidence for community colleges to move forward in incorporating social networking technology into the classroom environment, in order to enhance the communication and learning experiences of their students. Not only will CCCT be able to meet the expectations of these "digital natives," it will also be able to respond to the growing desire in higher education to incorporate new communication technologies using Web 2.0 applications (Bennett, & Maton, 2010). This is important particularly during an era of budgetary challenges because most Web 2.0 social networking platforms are free. Thus, the goals of this study are (a) to provide information on how Web 2.0 technologies intersect with the world of higher education from the students' perspective; (b) to offer recommendations for implementing social media tools to enhance students' educational experience; and (c) provide an argument for taking advantage of social media tools to enhance students' educational experience. Johansmeyer (2009) stated the following:

> Public community colleges face the same risks as other taxpayer-funded organizations and institutions, and social media tools when not used are the

> equivalent of flushing budget dollars, and that these tools easily engage students outside the classroom increases the odds of success. (p 1)

CCCT currently uses Twitter, a social networking application to communicate globally with students by broadcasting messages about campus life activities. Preliminary studies have suggested that Web 2.0 applications appear to be useful tools for a variety of campus needs, such as student group learning, faculty department work, staff collaboration, and student – teacher collaboration (Alexander, 2006).

This study may have implications for other community colleges considering Web resources for students by defining the ways that Web 2.0 technologies are currently used by students compared to how they could be used more broadly to deepen the learning experience. Studies in the past have shown that technology use in the classroom has increased and become a significant learning delivery tool. However, use of technology in the classroom primarily focused on content delivery, such as accessing and turning in course materials (Ajjan & Hartshorne, 2008).

When the project started, I believed that the survey used provided enough constructs needed in order to show a good fit needed to conduct path analysis. I developed the survey based on the DTPB model. However, during the validity and reliability stage of the project, I needed to modify the survey producing a survey with not enough variables needed to produce a good fit model for path analysis. In order to evaluate the research questions, I used linear regression, more specifically, the nonparametric Spearman rho correlation because it does not make the same normality assumption that the simple linear regression requires (Pallant, 2010). Furthermore, using

the Spearman rho correlation I was still able to show relationships between constructs, within the theory of DTPB. Lee et al. (2011) research using an extended model of the technology acceptance models (TAM) suggest that extending the model for acceptance of technology is less complex than DTPB. Furthermore, Lee et al. (2011) research findings suggested that combining innovation diffusion theory (IDT) with (TAM) provides an innovation perspective along with the intentions or beliefs towards acceptance.

Sadaf et al. (2013) conducted a study with the same theoretical premise using DTPB to explore preservice teachers' intentions to use Web 2.0 technologies. Sadaf et al. (2013) used a mixed-methods research design. They employed a convergence triangular mixed-methods design, in which they collected different but complementary data to validate and expand quantitative results with qualitative data, the result was data used to explain further factors related to DTPB. These results highlighted the connection between this project and DTPB based on the discovery of using certain research methods to arrive at determining relationships between constructs.

Summary of Analysis and Findings

Data Finding Conclusions

It appears from the data that students perceive having a social network and its benefits may have the potential to improve student learning, student-student interaction, and student-faculty interaction. Additionally, findings show significant positive relationships between attitude and behavioral intentions; subjective norms and behavior; peer influence and subjective norms; self-efficacy with facilitating conditions, and

perceived behavior control. On the other hand, there was no relationship between perceived behavior control and behavior.

The survey used did not support constructing a path analysis model because multiple scales had less than four items needed to run a CFA; so in order to look at relationships between constructs a Spearman rho correlation was conducted instead (Cohen, 1988). Although I chose a nonparametric statistical model to show relationships, the results still pointed to students understanding of the benefits for using Web 2.0 technologies for educational purposes.

Proposal for Implementation and Timetable

Because of the timeline for completion of my doctoral project, this new technology cannot be properly implemented until fall semester of 2016. Design and pilot implementation may start as early as summer semester of 2016. Success of this project also depends on acceptance of the need by the chancellor of distance learning, and faculty members of the college.

Roles and Responsibilities of Student and Others

The roles and responsibilities of school leadership require determining what courses will be migrated to Web 2.0 and how much of the course will be hybrid. Leadership will also have to determine what changes to policies affecting technology use will be made. Faculty roles and responsibilities will be contributing to the design requirements of the Web 2.0 or social networking site, along with supporting its implementation. Students must commit to following the policy associated with the change this new technology practice brings.

Evaluation Plan

I recommend the use the outcomes-based method to evaluate the implementation of SNT as a learning tool based on the findings from my study. It will have to be implemented within a specific timeline; I recommend this inquiry be conducted within 2 years, focusing on implementation and usefulness of the Web 2.0 tools used. This approach is justified because it will provide data to show implementation of discussed technologies and tools. Implementing in this way, the project will be the least intrusive, taking into consideration the importance of students' and faculty time and privacy as it relates to academia. The outcome and performance measures will be "does Web 2.0 technologies exist" "how effective are the Web 2.0 tools used" and "are students and faculty accepting of Web 2.0 tools used."

The overall evaluation goals are to see if the data analyses and findings were sufficient for the institution to make the decision to include Web 2.0 in its technology improvement plan while implementing the change. The key stakeholders are Chief Academic Advisor, Chancellor of Distance Learning, Faculty members, and Students' in distance learning programs.

The limitations of this project centers on faculty participation and school administrators' support of implementing a more robust social networking infrastructure at the institutions. Other limitations center on having limited support once presented at the quarterly Information Technology Board. Secondly, the college board of directors must also support this endeavor. Also, the infrastructure to include computer access and

hardware (laptops, desktops, electronic notepads with Wi-Fi) must be in place to support the Web 2.0 learning environment.

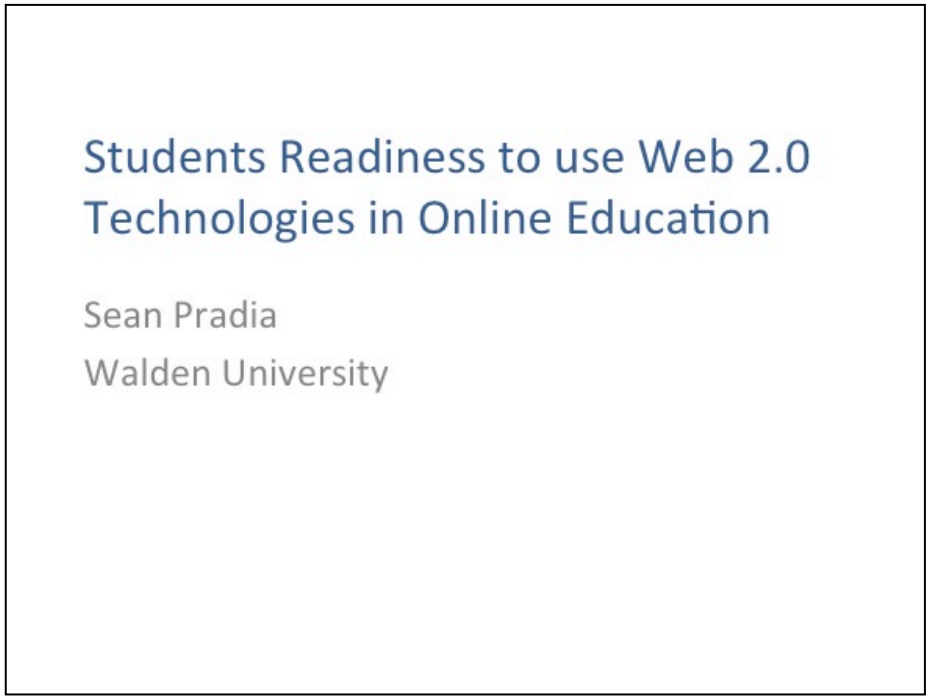
Recommendations Based on Findings

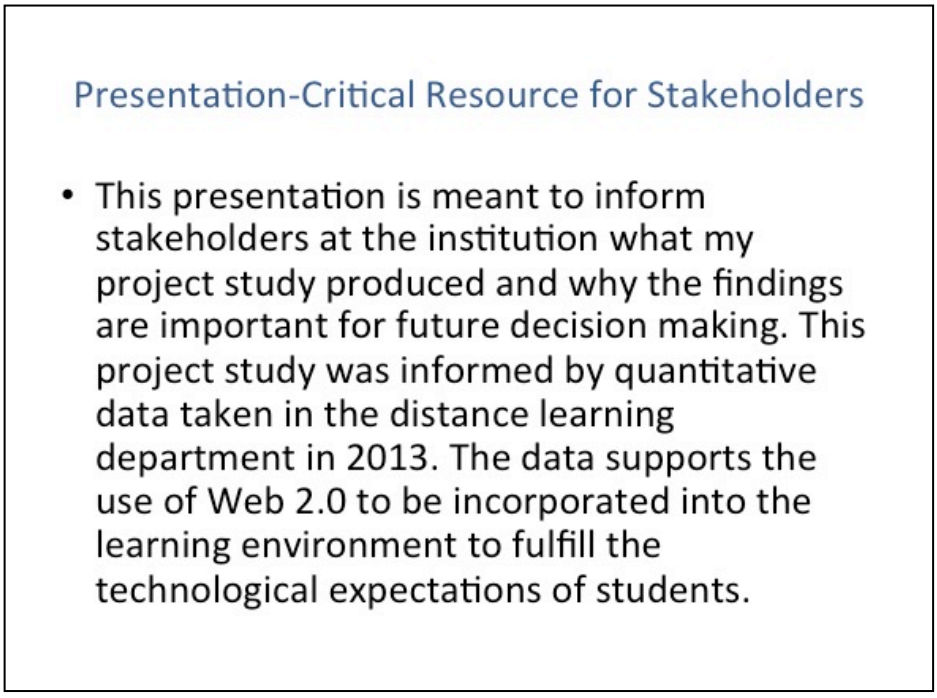
I recommend addressing the support issue would be to implement the program in manageable parts. Also, request the assistance from students who are participating in information system programs that focus on innovative adaptations of systems to improve communication and learning.

Additionally, I recommend the development of a technology helpdesk or broadened and existing helpdesk to handle assisting students who may experience technical issues. There are alternatives that may be considered to address the unforeseeable support and implementation issues of this project:

First, it is imperative to identify the champions for the project, everyone who is a decision maker in regards to project implementation should agree that there is a need for implementing social networking as an educational tool. They should also agree that the project should be implemented incrementally. Second, choose a team to establish and mandate advising sessions for faculty and students with a specific agenda that is forward leaning, perform the information technology project management task. This evaluation process should be continuous and integrated into the technology implementation plan as a regular ongoing endeavor.

Program Presentation Slides





The Local Problem

There has been a growing trend in higher education to incorporate technology into the learning environment in an effort to fulfill the technological expectations of students at the local level.

- In an era of new literacies, there is an urgent need for educators to expand classroom practices to include the social elements of Web 2.0 that our students today find appealing (Asselin, & Moayeri, 2011).

Background on the Local Problem

- The World Wide Web has become one of the dominant sources for providing information to students. However, the use of Web 2.0 technologies has emerged as a major approach to improve learning, information sharing, and collaboration among students and teachers.
- Although CCCT has been the leading distance learning provider, it is unclear if students are aware of the educational benefits of Web 2.0 technology and how these technologies may be used to supplement in-call learning.

Evidence of the Local Problem

- A survey was conducted by the Community College Survey of Student Engagement (CCSSE, 2009).
- Revealed that the use of social networking tools was clearly growing in frequency.
- 2009 CCSSE cohort included more than 400,000 students from 663 institutions that assessed students' effort given to their studies, whether they interacted with faculty and staff, and whether they are challenged by their academics.

Evidence of the Local Problem

- The survey found students who used social media multiple times a day for academic purposes, such as communicating with other students, instructors or college staff about coursework, had higher levels of engagement as compared to students who said they do not use such tools at all.
- Although promising results, Marklein (2009) stated that "colleges are not taking advantage of that particular set of tools for making connections with students to the extent tat they could" (p. D5).

Background

- Determining students awareness will help the institutions leaders, and faculty decide what technology to employ in order to meet the technological expectations of its students.
- Also, students may in fact be unaware of the pedagogical application of SNTs, which reveals a knowledge gap between the ways in which students use these tools for social and learning applications.

Background

- This study will help reduce the knowledge gap by exploring the relationship between community college students' awareness of how Web 2.0 technologies intersect with higher education, and develop a set of recommendations that support the implementation of SNTs to supplement the learning environment.

Rationale

- Purpose of this study was to examine both students' actual use and their awareness of the educational benefits of Web 2.0 applications in a community college in central Texas (CCCT).
- Additionally, a secondary goal was to understand the factors that influence student decisions to adopt these tools.

Research Questions

- 1. How do students' attitudes towards using Web 2.0 applications relate to behavioral intentions to use the technology?
- 2. How do students' subjective norm relate to the usage of Web 2.0 of students?
- 3. How does perceived behavioral control relate to the use of Web 2.0 applications by students?

Research Questions

- 4. How does peer (other students) influence to use Web 2.0 applications affect the subjective norms of students?
- 5. How does self-efficacy of using Web 2.0 applications and the availability of resources and technology relate to perceived behavioral control of students?

Methodology

- Descriptive survey design was use to capture quantitative data.
- Using this research design helped to determine students' awareness of the pedagogical benefits of Web 2.0 to supplement in-class learning, and to better understand factors that influence students' decision to adopt these tools (Ajjan, & Hartshorne, 2009).

Methodology

- Quantitative data revealed if students' use of Web 2.0 applications for learning may have possible positive effects on their behavior in the learning environment.
- Survey helped determine students' attitude towards using Web 2.0, behavioral intentions, students' subjective norms, perceived behavioral control, and peer influence as it relates to the usage of Web 2.0.

Methodology

- Why a Survey: According to Creswell (2008), "survey can help identify important beliefs and attitudes of individuals" (p.38).
- The use of a survey also provided a time and resource-efficient means of collecting data (Lodico, Spaulding, & Voegtle, 2010).
- The one-time survey used in this study took the form of an online questionnaire for flexibility and convenience for both student and faculty and facilitates ease of data collection and increased return rate (Perkins, 2004).

Methodology

- Data Analysis utilizing path analysis to test the hypothesized relationships.
- Path analysis can isolate “real” from “spurious effects” and is concerned with estimating the magnitude of the linkage between variables (Harthshorne, & Ajjan, 2009).

Methodology

- Determined the use of non-parametric model instead of Parametric model
- After conducting confirmatory facto analysis to test how well the data fit the item scales, resulted in the measurement model used not being a “good fit model”.
- Needed at least 4 items to run a CFA scale (Kline, 2011).

Methodology

- Due to not finding a goodness of fit model (GFI's), the research questions where evaluated using linear regression, more specifically, the non-parametric Spearman rho correlation.
- Spearman rho correlation dose not make the same normality assumption that the simple linear regression makes (Pallant, 2010).

Methodology Sample Size

- Simple Random sampling technique was used to select students for participation in survey.
- Sample Size of 500 was formulated using Fowler's Sample Size Table.
- Population for this survey research consisted of 500 students, 253 distance learning students competed the survey representing 51% of the initial sample.

Methodology Demographics

Demographic	*n*	%
Gender		
Female	118	49
Male	121	51
Age		
18-20	11	5
21-29	127	53
30-39	65	27
40-49	34	14
50-59	1	0
School year		
Freshman	106	44
Sophomore	132	55
Senior	1	0
Frequently used Web 2.0 technologies*		
Blogs	229	96
Wikis	232	97
Social networking	236	98
Social bookmarking	192	80
Other	156	65

253 participants took part in the study. 14 participants were removed based on multivariate outliers determined by Mahalanobis Distances.

Conducted analysis on remaining 239 participants.

**51% were male, 53% were 21-29 years old, majority of students were sophomores (55%), 99% used social networking, (3%) did not use wikis, and (96%) used blogs.*

Methodology Frequencies/Percentages for Use of Web 2.0 Technologies

Frequencies and Percentages for Use of Web 2.0 Technologies

	Don't use / Don't plan to Use		Don't Use / Plan to Use		Social networking		Frequently Use		Always use	
Technology	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Blogs	3	1	19	8	71	30	112	47	34	14
Wikis	-	-	10	4	72	30	120	50	36	15
Social networking	1	0	-	-	5	2	86	36	146	61
Social bookmarking	5	2	35	15	78	33	93	39	28	12
Instant messaging	2	1	-	-	8	3	97	41	131	55
Internet telephony	1	0	27	11	109	46	82	34	20	8
Audio/video conferencing	4	2	42	18	111	46	65	27	18	8

- *Participants rated how often they used Web 2.0 technologies. Rated 7 different technologies from "don't use /don't plan to use" to "always use."*
- *Social Networking had the highest frequency for "always use" (61%).*
- *Instant Messaging had (55%).*
- *Social Bookmarking was the item that was most-commonly selected for "don't use / don't plan to use" (2%).*
- *Audio/video conferencing was the most commonly selected item for "don't use / plan to use (18%).*
- *Followed by social bookmarking (15%).*

Examining the Research Questions

- **RQ1: How do students' attitudes towards using Web 2.0 applications relate to behavioral intentions to use the technology?**
  - Results of the examination suggest that a moderate, positive relationship existed between attitude and behavioral intentions.
  - As attitude increased, behavioral intentions also tended to increase.

Examining the Research Questions

- **RQ2: How do students' subjective norm relate to the usage of Web 2.0 of students?**
  - Results of the examination suggest that a small, positive relationship existed between subjective norm and behavior.
  - As subjective norm increased, behavior also tended to increase.

Examining the Research Questions

- **RQ3: How does perceived behavioral control relate to the use of Web 2.0 applications by?**
  - Results of the examination suggest that there was no relationship between perceived behavior control and behavior.
  - Because of the results we can neither state whether there's a positive relationship or a negative relationship.

Examining the Research Questions

- **RQ4: How does peer (other students) influence to use Web 2.0 applications affect the subjective norms of students?**
  - Results of the examination suggest that a moderate, positive relationship existed between peer influence and subjective norm.
  - As peer influence increased, subjective norm also tended to increase.

Examining the Research Questions

- **RQ5: How does self-efficacy of using Web 2.0 applications and the availability of resources and technology relate to perceived behavioral control of students?**
  - Results of the examination suggest that a moderate, positive relationship exist between self-efficacy and facilitating conditions with perceived behavior control.
  - As self-efficacy and facilitating conditions increased, perceived behavior control also tended to increase.

Data Finding Conclusions

- Students perceive having a social network and its benefits may have the potential to improve student learning, student-student interaction, and student-faculty interaction.
- Additionally, findings show significant positive relationships between:
  - Attitude and behavioral intentions
  - Subjective norms and behavior
  - Peer influence and subjective norms
  - Self-efficacy with facilitating conditions and perceived behavioral control.
  - No relationship between perceived behavior control and behavior.

Discussion

- Understanding what technologies students' use, and how they use it for educational purposes will better support the allocation of resources, support faculty aspirations for technology growth, and support student success.
- Findings are important because they represent an important link between social science, technology, and other academic disciplines.

Discussion

- As facilitating conditions increase and support of providing a more technology based learning environment, students need and desire to use more robust technological based learning tools will increase.
- These findings support changes that will occur in regards to technological advances in years to come.

Implementation

- First analyze current technology, and develop alternative social networking sites specifically designed for the higher education setting.
- Faculty will be the drivers of successful integration of technology into the classroom, literacy in regards to social networking sites in higher education must be achieved first.

Implementation Timeline

- Properly implemented during Fall Semester of 2016.
- Design and pilot implementation may start as early as summer semester of 2016.
- Success of this project also depends on acceptance of the need by the chancellor of distance learning, and faculty members of the college.

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Appendix B: Survey Instrument

Section I: Demographics

1). Gender (Male/Female)
2). Age (16-21; 22-27; 28-33; 34-40; Over 40)
3). Year at school (Freshman; Sophomore)

Section II: Web 2.0 Technologies

Construct: Comfort Level

Please list your comfort level with the following Web 2.0 applications [Never Use; Novice; Competent; Proficient]. Operational definition of never use, novice, competent, and proficient: Never Use = Never used the Web 2.0 applications listed below; Novice = Use Web 2.0 to view, send and receive text; Competent = Use Web 2.0 applications to organize information, set up task, and actively use Web 2.0 for decision making; Proficient = Use Web 2.0 to develop coordinate and publish information on the internet.

6). Blogs (Blogger, WordPress) [Never Use, Novice, Competent, Proficient]

7). Wikis (Seedwiki, Wikipedia) [Never Use, Novice, Competent, Proficient]

8). Social Networking (Facebook, LinkedIn, MySpace) [Never Use, Novice, Competent, Proficient]

9). Social Bookmarking (digs, de.licio.us) [Never Use, Novice, Competent, Proficient]

10). Instant Messaging (MSN Messenger, Yahoo Messenger) [Never Use, Novice, Competent, Proficient]

11). Internet Telephony (Skype; oovoo) [Never Use, Novice, Competent, Proficient]

12). Audio/Video Conferencing [Never Use, Novice, Competent, Proficient]

Construct: Actual Usage

To what extent do you use the following Web 2.0 applications to supplement your in-class learning: [Don't use and don't plan to use; Don't use but plan to use; Use occasionally; Frequently use; Always use; N/A]

13). Blogs (Blogger, WordPress)

☐Don't Use and Don't Plan to Use ☐Don't Use but Plan to Use
☐Use Occasionally ☐Frequently Use
☐Always use ☐N/A

14). Wikis (Seedwiki, Wikipedia)

☐Don't Use and Don't Plan to Use ☐Don't Use but Plan to Use
☐Use Occasionally ☐Frequently Use
☐Always use ☐N/A

15). Social Networking (Facebook, MySpace)

☐Don't Use and Don't Plan to Use ☐Don't Use but Plan to Use
☐Use Occasionally ☐Frequently Use
☐Always use ☐N/A

16). Social Bookmarking (Diggs, de.licio.us)

☐Don't Use and Don't Plan to Use ☐Don't Use but Plan to Use
☐Use Occasionally ☐Frequently Use
☐Always use ☐N/A

17). Instant Messaging (MSN Messenger, Yahoo Messenger)

☐Don't Use and Don't Plan to Use ☐Don't Use but Plan to Use
☐Use Occasionally ☐Frequently Use
☐Always use ☐N/A

18). Internet Telephony (Skype)

☐Don't Use and Don't Plan to Use ☐Don't Use but Plan to Use
☐Use Occasionally ☐Frequently Use
☐Always use ☐N/A

19). Audio/Video Conferencing

☐Don't Use and Don't Plan to Use ☐Don't Use but Plan to Use
☐Use Occasionally ☐Frequently Use
☐Always use ☐N/A

Construct: Attitude Toward Web 2.0

What are, in your opinion, the advantages of using each of the following Web 2.0 technologies to supplement in-class learning? [Blogs; Wikis; Social Networking; Instant Messaging; Internet Telephony; Audio/Video Conferencing]. Please check all that apply.

20). Blogs

☐Improve my interaction with faculty ☐Improve my learning
☐Improve my satisfaction with the course ☐Improve my interaction with other students
☐Improve my grades ☐Improve my writing ability

21). Wikis

☐Improve my interaction with faculty ☐Improve my learning
☐Improve my satisfaction with the course ☐Improve my interaction with other students
☐Improve my grades ☐Improve my writing ability

22). Social Networking

☐Improve my interaction with faculty ☐Improve my learning
☐Improve my satisfaction with the course ☐Improve my interaction with other students
☐Improve my grades ☐Improve my writing ability

23). Instant Messaging

☐Improve my interaction with faculty ☐Improve my learning
☐Improve my satisfaction with the course ☐Improve my interaction with other students
☐Improve my grades ☐Improve my writing ability

24). Internet Telephony

☐Improve my interaction with faculty ☐Improve my learning
☐Improve my satisfaction with the course ☐Improve my interaction with other students
☐Improve my grades ☐Improve my writing ability

25). Audio/Video Conferencing

☐Improve my interaction with faculty ☐Improve my learning
☐Improve my satisfaction with the course ☐Improve my interaction with other students
☐Improve my grades ☐Improve my writing ability

Section III: Utilization of Web 2.0 Technologies in Course (Five Point Likert-type scale used to examine factors that influence student intentions to utilize Web 2.0 technologies in their course)

Question: Thinking of that Web 2.0 technology you use (or could use) most frequently to supplement your in-class learning, to what extent do you agree or disagree with the following statements:

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Construct: Behavior					
26). I believe that I could communicate to others the consequences of using Web 2.0 to supplement my in class learning.					
27). I would have no difficulty explaining why Web 2.0 technologies may or may not be beneficial.					
Construct: Behavioral Intention					
28). I plan to use Web 2.0 technologies to supplement my in-class learning.					
29). I intend to use Web 2.0 technologies within the next semester.					
Construct: Attitude Toward Web 2.0					
30). Web 2.0 is useful to supplement my in-class learning.					
31). The advantage of using Web 2.0 outweighs the disadvantages of not using it.					
32). Using Web 2.0 is a good idea.					
Construct: Ease of Use					
33). I feel that using Web 2.0 will be easy.					

34). I feel that using Web 2.0 will be easy to incorporate in my learning environment.					
Construct: Perceived Usefulness					
35). I feel that using Web 2.0 will help me learn more about the subject.					
36). I feel that using Web 2.0 will improve satisfaction with the course.					
37). I feel that using Web 2.0 will improve my grades.					
38). To help me better learn the material, I will incorporate Web 2.0 technologies to supplement my in-class learning.					
Construct: Subjective Norms					
39). My peers think I will benefit from using Web 2.0 technologies to supplement in-class learning.					
40). My peers are using Web 2.0 technologies to supplement their in-class learning.					
41). My teacher confirms my ability and knowledge to use Web 2.0 technologies to supplement my in-class learning.					
42). My teacher thinks it is important I use Web 2.0 technologies to supplement my in-class learning.					
Construct: Perceived Behavioral Control					
43). Using the Web 2.0 technologies is entirely within my control.					
44). I have the knowledge and ability to use Web 2.0.					
Construct: Peer Influence					
45). Peers who are important to me would think that I should use Web 2.0 technologies to supplement my in-classroom learning.					
46). Peers who influence my behavior would think that I should use Web 2.0 technologies in the classroom.					
Construct: Facilitating conditions-technology					
47). The Web 2.0 technologies are compatible with the computer I use in the classroom.					
Construct: Facilitating condition-resources					
48). I can use Web 2.0 technologies using any computer connected to the internet.					
Construct: Self-efficacy					
49). I would feel comfortable using Web 2.0 technologies.					
50). I could easily use Web 2.0 technologies on my own.					
51). I know enough to use Web 2.0 technologies.					
Construct: Superior Influences					
52). My instructors, who influence my behavior, would think that I should use Web 2.0 technologies in the classroom.					
Construct: Student Influence					
53). Students who influence my behavior think that I should use Web 2.0 technologies in the classroom.					
54). Students who are important to me think that I should use Web 2.0 technologies in the classroom.					

Survey Adapted from Hartshorne, R., & Ajjan, H. (2009). Examining student decisions to adopt Web 2.0 technologies: Theory and empirical tests. Journal of Computing in Higher Education, 21(3), 183-198

Appendix C: H. Ajjan, R. Hartshorne Questionnaire (Investigating Faculty Decisions to Adopt Web 2.0 Technologies)

Table 2
Reliability analysis of each construct

Construct	Item	α value
Actual usage/behavior		0.89
AU1	I believe that I could communicate to others the consequences of using Web 2.0 in the classroom	
AU2	I would have no difficulty explaining why Web 2.0 technologies may or may not be beneficial	
Behavioral intention		
INT1	I plan to use Web 2.0 technologies in my classroom	0.951
INT2	I intend to use Web 2.0 technologies within the next semester	
INT3	I will add Web 2.0 technologies to my class next semester	
Attitude		0.932
ATT1	Web 2.0 is useful in my teaching	
ATT2	The advantage of using Web 2.0 outweighs the disadvantages of not using it	
ATT3	Using Web 2.0 is a good idea	
Ease of use		
EU1	I feel that using Web 2.0 will be easy	0.9
EU2	I feel that using Web 2.0 will be easy to incorporate in my classroom environment	
Perceived usefulness		0.946
PU1	I feel that using Web 2.0 will help my students learn more about the subject	
PU2	I feel that using Web 2.0 will improve students' satisfaction with the course	
PU3	I feel that using Web 2.0 will improve students' grades	
PU4	I feel that using Web 2.0 will improve students' evaluation	
PU5	To help my students better learn the material, I will incorporate Web 2.0 technologies in the classroom	
Subjective norms		0.84
SN1	My peers are using Web 2.0 technologies in their classroom	
SN2	My superior confirms my ability and knowledge to use Web 2.0 technologies in the classroom	
SN3	My peers think I will benefit from using Web 2.0 technologies in my classroom	
SN4	My superior thinks it is important I use Web 2.0 technologies in my classroom	
SN5	My students thinks it is important I use Web 2.0 technologies in my classroom	
Perceived behavioral control		0.67
PBC1	Using the Web 2.0 technologies is entirely within my control	
PBC2	I have the knowledge and ability to use Web 2.0	
Peer influence		0.94
PI1	Peers who influence my behavior would think that I should use Web 2.0 technologies in the classroom	

PI2	Peers who are important to me would think that I should use Web 2.0 technologies in the classroom

Construct	Item	α value
Superior influence		0.98
	My superior, who influences my behavior would think that I should use Web 2.0 technologies in the classroom	
	My superior whom I report to would think that I should use Web 2.0 technologies in the classroom	
Student influence		0.92
SI1	Students who influence my behavior think that I should use Web 2.0 technologies in the classroom	
SI2	Students who are important to me think that I should use Web 2.0 technologies in the classroom	
Compatibility		0.91
Comp1	Using Web 2.0 technologies are compatible with the way I teach	
Comp2	Using Web 2.0 technologies fit well with the way I teach	
Facilitating conditions—technology		
FC1	The Web 2.0 technologies are compatible with the computer I already use in the classroom	
Facilitating conditions—resources		
FC2	I can use Web 2.0 technologies using any computer connected to the Internet	
	Self-efficacy 0.95	
SE1	I would feel comfortable using Web 2.0 technologies	
SE2	I could easily use Web 2.0 technologies on my own	
SE3	I know enough to use Web 2.0 technologies	

H. Ajjan, R. Hartshorne / Investigating faculty decisions to adopt Web 2.0 technologies: Theory and empirical test/Internet and Higher Education 11 (2008) 71–80.

E-mail communication allowing me to utilize this survey in my research project.

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Subject: RE: Request to use Quantitative Instrument/Sean Pradia-Walden
University Doctoral Candidate
From: "Hartshorne, Richard" <rhartsho@uncc.edu>
Date: 3/29/12 8:32 PM
To: Sean Pradia <seanpradia@gmail.com>
CC: Haya Ajjan <hajjan@elon.edu>

Hello Sean,

That would be fine. The survey is being used in a number of contexts,
but it doesn't appear any of them overlap with what you are doing. I
have attached the survey to this e-mail. Good luck with your
scholarship.
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Cheers,

Richard Hartshorne, Ph.D. | Associate Professor of Instructional Systems Technology
UNC Charlotte | Dept. of Educational Leadership
9201 University City Blvd. | Charlotte, NC 28223
Phone: 704-687-8711 | Fax: 704-687-3493
rhartsho@uncc.edu

_____
From: Sean Pradia [seanpradia@gmail.com]
Sent: Thursday, March 29, 2012 3:07 PM
To: Hartshorne, Richard
Subject: Fwd: Request to use Quantitative Instrument/Sean Pradia-Walden University Doctoral Candidate

>> >> Dr. Hartshorne, Dr. Ajjan,
>> >>
>> >> My name is Sean Pradia I am currently a doctoral student at Walden University/Candidate ID: A00143147. I am in the proposal phase of my research study and wanted to request permission to use a quantitative instrument that you have developed. The instrument that I am referring to was used in your study titled "Examining student decisions to adopt Web 2.0 technologies: Theories and empirical tests". My study is also based on the Decomposed Theory of Planned Behavior.
>> >>
>> >> The study that I am proposing is titled "Social Networking and Education: Examining Decisions by Students at (specified 2 year college) to Use Web 2.0 Technologies as a Learning Tool". If you would like more information about my study in order to grant permission I will be happy to provide what's required.
>> >>
>> >> Regards, Sean Pradia
>> >> (361) 960-1883
>> >>
>> >>
Attachments:
web-2-0-student-survey.pdf 103 KB

Appendix D: Questionnaire Items From Taylor and Todd's (1995) *For Understanding IT Usage*

Attitudinal Structure

Perceived Usefulness

The CRC will be of no benefit to me.
A service that is of no benefit to me is: (bad/good).

Using the CRC will improve my grades.
A service that will improve my grades is: (bad/good).

The advantages of the CRC will outweigh the disadvantages.
A service with more advantages than disadvantages is: (bad/good).

Overall, using the CRC will be advantageous.
A service that is advantageous is: (bad/good).

Compatibility

Using the CRC will fit well with the way I work.
A service that fits well with that way I work is: (bad/good).

Using the CRC will fit into my work style.
A service that fits into my work style is: (bad/good).

The setup of the CRC will be compatible with the way I work.
A service that is compatible with the way I work is: (bad/good).

Ease of Use

Instructions for using equipment in the CRC will be hard to follow.
Instructions that are hard to follow are: (bad/good).

It will be difficult to learn how to use the CRC.
A service that is difficult to learn is: (bad/good).

It will be easy to operate the equipment in the CRC.
A service with equipment that is easy to operate is: (bad/good).

Normative Structure

Peer Influences

My friends would think that I should use the CRC.
Generally speaking, I want to do what my friends think I should do.

My classmates would think that I should use the CRC.
Generally speaking, I want to do what my classmates think I should do.

Superior Influences

My professors would think that I should use the CRC.
Generally speaking, I want to do what my professors think I should do.

Control Structure

Efficacy

I would feel comfortable using the CRC on my own.
For me, feeling comfortable using a service on my own is:
(unimportant/important).

If I wanted to, I could easily operate any of the equipment in the CRC on my own.
For me, being able to easily operate equipment on my own is
(unimportant/important).

I would be able to use the equipment in the CRC even if there was no one around to show me how to use it is: (unimportant/important).
For me, being able to use equipment even if there is no one around to show me how to use it is: (unimportant/important).

Facilitating Conditions-Technology

The equipment (printers, computers, etc.) in the CRC are not compatible with the other computers I use.
For me, a service having equipment that is compatible with the other equipment I use is: (unimportant/important).

The software in the CRC is not compatible with the software I use is:
(unimportant/important).
For me, a service having software that is compatible with the software I use is:
(unimportant/important).

I will have trouble reading my disks in the CRC.
For me, whether or not I have trouble reading my disks is:
(unimportant/important).

Facilitating Conditions-Resources

There will not be enough computers for everyone to use in the CRC.
For me, having enough computers for everyone to use is:
(unimportant/important).

Printing in the CRC will be too expensive.
For me, being able to print for a low price is: (unimportant/important).

I won't be able to use a computer in the CRC when I need it.
For me, being able to use a computer when I need it is: (unimportant/important).

Behavioral intension

I intend to use the CRC this term.
I intend to use the CRC to print
Projects, papers or assignments this term.
I intend to use the CRC frequently this term.

Attitude

Using the CRC is a (bad/good) idea.
Using the CRC is a (foolish.wise) idea.
I (dislike/like) the idea of using the CRC.
Using the CRC would be: (unpleasant/pleasant).

Subjective norm

People who influence my behavior would think that I should use the CRC.
People who are important to me would think that I should use the CRC.

Perceived behavioral control

I would be able to use the CRC.
Using the CRC is entirely within my control.
I have the resources and the knowledge and the ability to make use of the CRC.

Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. Information Systems Research, 6(2), 144–17.