THE IMPACT OF ONLINE DELIVERY SYSTEMS ON STUDENT PERCEPTIONS OF ACADEMIC ACHIEVEMENT IN HIGHER EDUCATION LEARNING ENVIRONMENTS

CHERONA HICKLIN

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The undersigned, approved by the Department Chair of Graduate Studies in Education, have examined a dissertation entitled:

THE IMPACT OF ONLINE DELIVERY SYSTEMS ON STUDENT PERCEPTIONS OF ACADEMIC ACHIEVEMENT IN HIGHER EDUCATION LEARNING ENVIRONMENTS

Presented by Cherona Hicklin a candidate for the degree of Doctor of Education and hereby certify that in their opinion it is worthy of acceptance.

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Dr. James Truelove, Advisor/Chair

Chairperson of Graduate Studies in Education

_____

Dr. Robert Perry, Committee Member

Professor of Educational Administration

_____

Dr. Michael Arnold, Committee Member

Professor of Educational Administration

THE IMPACT OF ONLINE DELIVERY SYSTEMS ON STUDENT PERCEPTIONS OF ACADEMIC ACHIEVEMENT IN HIGHER EDUCATION LEARNING ENVIRONMENTS

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Cherona Hicklin, B.S, M.S.,Ed.Spec.

Dr. James Truelove, Dissertation Advisor

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TABLE OF CONTENTS

List of Tables

Abstract

Online learning has become a popular way for students to take courses. These courses are in need of improved pedagogies in order to increase student performance and retention. Researchers recognize the need for more supportive environments for technology integration (Davis, Preston, & Sahin, 2009). The purpose of this study was to examine the impact of using Twitter as an instructional tool in an online class as opposed to only using Blackboard as an instructional tool. The guiding theories for this study were the theories of Constructivism and Connectivism. The research questions examined the impact Twitter and Blackboard on student perceptions of achievement. The study used a convenience sample of 153 students enrolled in online classes at a four -year university located in the Midwest. Half of the classes used Twitter while the other half only used Blackboard as an instructional tool. The dependent variable was student perception of achievement and the independent variable was the use of Twitter. There was not a significant difference between the two groups, however several items of significance emerged from the study. Self reported student data indicated both groups of students were more favorable toward using Twitter and Blackboard if they had not taken an online class before. Data also suggested males were more favorable toward the use of Twitter in online learning environments. Implications for educational institutions include informing instructors of the value of using online learning platforms to enhance content rich dialogue between students and instructors in formal and informal ways in order to increase student achievement.

The Impact of Online Delivery Systems on Student Perceptions of Academic Achievement in Higher Education Learning Environments

Introduction

The decline of state funding is a worrisome factor facing higher education institutions (Kelderman, 2012). To offset lost revenue without seeking cuts, institutions desire to increase enrollment. To meet this objective, higher education administrators are seeking out ways to increase course offerings. Many of those offerings are online courses. Online courses offer several advantages to students such as time and location. However, significant drawbacks are associated with these types of courses. According to Levy (2007), students attending online courses drop out at a substantially higher rate than students in on campus courses. These courses are in need of improved pedagogies in order to increase student performance and retention. Researchers recognize the need for more supportive environments for technology integration (Davis, Preston, & Sahin, 2009). Educators continue seeking out ways to improve classroom instruction in order to maximize learning opportunities. To meet changing learner needs, the instructor must recognize the need to shift from sole custodian of knowledge to a role embracing the relationship between the instructor and leaner and recognizes the necessity to jointly construct content (Enonbun, 2010). A paradigm shift must come through more exposure to user-centered publication of content. An inverted instructional model must be present allowing users to create, publish and distribute content, making them producers of media, instead of solely consumers of media (Craig, 2007). Pedagogy must be at the root of changes needed to effectively equip twenty-first century learners. The utilization of modern tools takes into consideration the need for Information and Communication Technologies, media and the emerging need for active participation of individuals (Turcsanyi-Szabo, 2012). A limited

amount of research has been done empirically to determine students' perceptions of Web 2.0 benefits. However, researchers expect these tools to provide several benefits based on a structure encouraging active participation (Hicks & Graber, 2009; Rienzo & Han, 2009). In addition, these tools possess the capability to promote environments for publication, reflection, and collaboration (Ferdig, 2007).

Teachers must modify their teaching practices to integrate critical thinking and literacy skills using 21st Century technology tools in an effort to develop learning environments that meet the digital lifestyle of millennial learners. Student interaction and knowledge production are vital to success in the online learning environment. New ways of understanding the material emerge when the learner comes into contact with different or new perspectives that are the result of collaboration amongst a community of learners (Reio & Crim, 2006). The use of Web 2.0 tools, more specifically Twitter, provides students with a learning platform offering opportunities to interact with peers and content as well as the opportunity to engage in knowledge production. According to Fox and Varadarajan (2011), research on Twitter and its Web 2.0 constituents is in the infancy stages. This study will broaden the research perspective and determine how the use of Twitter impacts student retention, performance, and perception of learning in the online classroom.

Problem Statement

The lack of a specific learning pedagogy for online instruction may be hindering the learner capabilities of college students. Student retention rates in online classes are lower than face-to-face classes (Herbert, 2006). For online courses to provide optimal learning opportunities, instructors must establish social presence within this realm.

Rationale for the study

Since the 1990's researchers have debated the effectiveness of online course delivery. Some believe the lack of social presence in the online environment hinders achievement and negatively impacts retention rates. Researchers have only begun to establish effective methods for integrating pedagogy into online learning (Pettenati & Cigognini, 2007). Unless educators change the way online courses are taught, they will continue to see inadequate learner progress. Researchers need to explore how establishing social presence in the online learning environment is possible through the use of Web 2.0 tools such as blogs and Twitter. These tools not only encourage learner participation, but also potentially provide learners an avenue to construct knowledge in a collaborative framework.

Theoretical Framework

The theories of Constructivism and Connectivism are the framework for this study. Constructivism views learners as active rather than passive (Vygotsky, 1986). The process of obtaining knowledge is not external, but rather internal. New information is processed and received through the senses to create knowledge. The role of the learner is central and the instructor serves as a facilitator, guiding and directing the student through the process of learning instead of simply providing the desired content. Vygotsky (1986) defines the Zone of Proximal Development as the distance between the actual developmental level of the learner and the potential developmental level determined through problem solving and collaboration with peers. John Dewey embraced principles of Constructivism believing in a naturalistic approach that viewed knowledge as arising from an active adaptation of the human organism to its environment. Dewey believed inquiry should not consist of a mind passively observing the world and drawing from it, but rather as a process examining, manipulating, and testing new

information before proceeding to action (Hook, 1995). Siemens (2006) defines learning as the patterns of knowledge on which we act directed at making specialized sets of information connect. Connectivism or the Connectivist Theory is for the digital age, centralized on working and learning by individuals in a networked environment. The theory states learners do not have full control over what we learn since others in the network continually change information, requiring new learning to occur as well as requiring the unlearning of old information (Anderson, 2008).

Research Questions

1. Does the implementation of Twitter impact student perceptions of achievement in online, general education courses?
2. Does the implementation of Blackboard impact student perceptions of achievement in online, general education courses?

Hypotheses

1. There is no difference in student perception of achievement in online, general education courses when Twitter is implemented.
2. There is no difference in student perception of achievement in online, general education courses when Blackboard is implemented.

Limitations

The usage of surveys emits responses subject to respondent perception or attitude. Lack of respondent participation may not give an accurate representation of data. The data collection period was half of the academic semester. Participants will be chosen based on course enrollment therefore the sample is a purposive sample of convenience. Participants were only college level

students enrolled in general education online courses. The study focuses on student achievement in online courses only. Instructor viewpoints were not included.

Delimitations

Survey participants were from a four-year university in the midwest, participants surveyed were enrolled in general education courses. The participants engaged in the study were primarily underclassmen as the courses selected for the study satisfied core requirements.

Summary

Higher education institutions are using online courses increasingly to maximize course offerings. These new modes of instructional delivery tools have the potential to create a learning platform similar to a face-to-face course. Currently, many new technologies used are focused on delivery of information rather than actual instruction (Davis, Lennox, Walker, & Walsh, 2007). New technologies may actually perpetuate transmissive models of teaching rather than embracing innovative pedagogic methods (Rogerson-Revell, 2007). There is a continuing need to bridge the gap between pedagogic and technical expertise and create instructional materials to promote effective online instruction. Instructor time is spent learning how to use online systems instead of implementing innovative pedagogies that stimulate learner interaction. According to Can (2009), interaction is a potential key factor in online education and an essential component for successful instruction. The overall goal for creating interaction or social presence in an online or face-to-face course is to create a level of comfort where students are at ease with one another and the instructor (Reio & Crim, 2006). What remains vague is the direction and pace of changes to be made in the realm of best practices. Highlighting the relevance of learning theories developed over centuries and determining how they connect to emerging technologies is a priority (Enonbun, 2010). As the global learning environment expands in terms of learner

expectations and instructional methods, it is essential to find a model or framework to establish a concrete foundation for teaching online (Enonbun, 2010).

Chapter II

Review of Literature

Introduction

Cuts in funding for higher education learning institutions have prompted educators to reevaluate course design. Universities have added to the number of online courses offered each semester. In order to provide students an experience equitable to a face to face class, instructors need an understanding of opportunities to enhance learning by incorporating Web 2.0 tools into the curriculum. Instructors must realize the need to embrace the student to student and student to instructor relationship by providing opportunities for students to actively participate in their own learning (Enonbun, 2010). Effective pedagogical practice combined with tools that facilitate publication, reflection, and collaboration have the potential to change teaching and learning in the online realm.

Social Presence

The construct known as social presence is rooted in the work of Mehrabian (1969). Short, Christie, and Williams (1976) first introduced the term social presence as "the salience of the other in a mediated communication and the consequence salience of their interpersonal interactions" in a telecommunications environment (p.65). Online learners need opportunities to interact and receive immediate feedback from one another. Immediate feedback or immediacy is defined as "those communication behaviors that enhance closeness to the nonverbal interaction with another" (p. 203). Instructional strategies must take into account factors that enhance interaction and student perceptions of learning. Past research indicates students perceive the online environment as engaging and rewarding when presented with multiple opportunities to think critically, collaborate, and reflect. Studies indicate social presence as influential in

constructivist based learning environments placing emphasis on social interaction and its effect on absorbing knowledge. Tao (2009) found student levels of online social presence fluctuate based on the time of the semester. Greater social presence was seen early in the semester, increased at mid-term, and then returned to the early levels at the end of the semester. Tao also observed verbal immediacy having an impact on social presence levels.

Rapid changes in the appearance of education due to the infusion of technology have caused the prompting of questions about how constructivist practice relates to the use of establishing social presence through the use of technology in the classroom. Teachers with a constructivist orientation consider student perspectives when facilitating learning, provoke questions, focus on the bigger ideas relevant to their students, and encourage reflective thinking. Teachers following constructivist theory utilize technology in a manner to engage and push students in a direction to connect on a deeper level and generate meaning within the material (Overbay, Patterson, Vasu, & Grable, 2010). Researchers believe the focus needs to be on integrating technology into the curriculum rather than emphasizing technical training. According to Wanstreet, (2006) "Educators do not yet know what forms of interaction people need, want, or expect to support their learning; and until we fully understand what it is about face-to-face interactions that enhance learning, we cannot know what features are required for an online system" (p. 99).

Online instruction has provided contrary, inconclusive and opposing research findings on the effectiveness of this delivery method for different students (Cicco, 2007). Despite a need to enhance instruction in online course delivery, it is important to also analyze flaws with this structure. Attrition is one of the main concerns of online education. The dropout rates for students in distance education courses are usually higher than those in on campus courses. Some

believe the high dropout rates are connected to a lack of attention to student learning styles. Learning style describes how "each learner begins to concentrate on, process, eternalize, and retain new and difficult information" (Dunn & Dunn, 1993, p.2). Learning styles can be accentuated when students engage in goal driven and activity-based experiences such as discovery learning, project-based learning, and cooperative learning (Zapalska & Broznik, 2006). Researchers find results supporting and negating the effectiveness of online instruction and the relationship to learning-style preferences and academic achievement and attitudes (Cicco, 2007).

Ultimately, there is a lack of evidence evaluating the knowledge students gain, the objectives of distance learning, and how the objectives are being realized (O'Lawrence, 2006). Employing technologies like Internet, websites, and virtual learning environments, collaborative learning, problem-based learning, and goal-based scenarios in addition to learning platforms like Moodle and Blackboard have the potential to create a multiple constructivist condition that can change online teaching and learning (Can, 2009). Additional research on creating social presence through constructivism pedagogies must be done. Researchers need an increased understanding of the needs, experiences, and perspectives lending to optimal educational environments and opportunities for online learners (Reio & Crim, 2006).

Synchronous and Asynchronous Learning

Online learning has the ability to offer interactive learning experiences. Online communication structures fall into two categories, synchronous and asynchronous. Synchronous online learning involves two or more people in real-time. Asynchronous online learning involves interactions not requiring participants to be online simultaneously; it is time delayed (Reio & Crim, 2006). Students desire social interaction within the online course. Social interaction is a natural human need and an integral factor of the development of the learning

processes (Vygotsky, 1986). Vygotsky's emphasis on the social aspect of learning has led educators and researchers to focus on how learning occurs in addition to what is being learned. Research continues to identify an ongoing need for active learning environments offering high levels of learner engagement (Reio & Crim, 2006). New ways of understanding emerge as the learner receives different perspectives from those with whom they collaborate with online (Reio & Crim, 2006).

Asynchronous courses offer a flexible learning environment where content is accessed through recordings, CDs, or podcasts. Student communication and collaboration occurs through discussion boards. An asynchronous option allows learners unrestricted times for communication and additional time to plan responses to directions or questions (Skylar, 2009). Asynchronous class sessions may be the primary delivery source or serve as a supplemental source to online or traditional courses. According to the National Center for Educational Statistics (2008), among the institutions offering online courses during the 2006-2007 academic year, 92 percent reported courses offered by an asynchronous format.

Synchronous courses are more reflective of the traditional classroom methods. These courses are conducted in real-time with the instructor leading learning and students all logged in simultaneously and engaging in direct communication (Shi & Morrow, 2006). Past renditions of synchronous learning environments included video-conferencing equipment housed in certain classrooms and required students to travel to a specific destination. Students today can access software and engage in chat rooms, audio/video conferencing, and two-way live satellite broadcast lectures (Skylar, 2009). Among institutions offering online courses in the 2006-2007 academic year, 31 percent reported courses offered in a synchronous format; nineteen percent used two-way video and audio (NCES, 2008). Few online programs rely on synchronous

sessions and miss out on the opportunity to engage students in powerful and active learning experiences.

According to Can (2006), employing technologies like the Internet, websites, virtual learning environments, computer conferencing, videoconferencing and hypermedia designs for learning in addition to structures supporting collaborative learning and problem-based learning could have the potential to cause upheaval in the online teaching and learning environment. Synchronous learning environments support communication between the instructor and the students as well as between the students and other students. According to Holden, Westfall, and Gamor (2010), two-way oral or visual communication facilitates the transfer of knowledge from the instructor to students and is only achievable the use of audio response systems, interactive keypad devices, or video conferencing devices supporting the exchange of data and voice. Synchronous learning environments include the following components:

Provide a dialectic learning environment with varying levels of interactivity

Encourage spontaneity of responses

Allow for optimal pacing for best learning retention

Allow for immediate reinforcement of ideas

Control length of instruction when completion time is a constraint

Constrained by time, not place (Holden, Westfall, and Gamor, 2010)

Constructivism

Despite an increased focus on student and teacher accountability, little research has been based on the conceptual framework of constructivism (Overbay, Patterson, Vasu, & Grable 2010). Learning, specifically online learning is changing at a rapid pace. A need to find a symbiosis between technology and theory is evident. Using the constructivist theory in the

classroom, technology should serve as a tool to push students in making deeper connections with the material, generate meaning, and learn more than how to regurgitate isolated bits of information (Overbay, Patterson, Vasu, and Grable, 2010). A shift in the way technology is used has the potential to enhance learning opportunities in new ways. According to Jonassen, Howland, Moore, & Marra (2003), technology can no longer serve as a platform for simple rote, drill, and skill-focused approaches. Technology must serve as a set of tools for knowledge construction through means as simulations, hypermedia, and problem based learning environments. Social constructivism asserts learning is greatly dependent upon the interactions, collaboration, and social exchanges that occur in the classroom setting. According to Woo & Reeves (2007), multiple criteria for learning environments consistent with the theoretical framework of constructivism include learning environments adopting the following: 1) engage learners in authentic learning; 2) create collaborate opportunities for the instructor, experts, and other students; 3) engage students in defining, implementing, and negotiating perspectives relative to the classroom learning task; 4) incorporate collaboration, debate, and analysis as tools to refine and complete the classroom learning task; and 5) assure students have access to communicate with classmates, instructor, and resources in order to clarify points of confusion and provide understanding of concepts. Kester, Kirschner, and Corbalan (2006) recommend learning environments include three integral elements 1) complex learning occurs, 2) student motivation for learning is instrinsic, and 3) dialogue and debate are integral elements. Research indicates students at the college level perceive instructors as effective when the key components are embedded in their courses. Instructors who provide multiple opportunities for interactions, provide critical information clearly and accurately, and organize the learning environment in a

way that is managed in an orderly and efficient manner are seen as effective (Onwuegbuzie, Witcher, Collins, Filer, Wiedmaier, and Moore, 2007).

Connectivism

The theory of connectivism, also referred to as the connectivist theory launched in 2004, gave a broader insight into the application of constructivism pedagogies to the online learning environment. This theory was based on a critique of previous learning theories labeled as behaviourism, cognitivism, and constructivism (Pettenati & Cigognini, 2007). According to Siemens (2004), the latter theory appeared to be the possible theoretical framework for e-learning practices but it could not provide adequate theoretical support to instances brought about by newer approaches to learning (Pettenati & Cigognini, 2007). Siemens introduced the connectivism theory to integrate further theoretical support to online learning. Siemens stated, "the pipe is more important that the content within the pipe," indicating that it is the network itself that is the basis of the learning process (Pettenati & Cigognini, 2007, page 2). According to Siemens (2006) learning, defined as patterns of knowledge on which we act is directed at making specialized sets of information connect. Connectivism can therefore be applied as social networking in relationship to learning and knowledge (Pettenati & Cigognini, 2007). Social networking or social software as it is often referred to as providing a foundation on which online learning can be built. According to Bonaiunti (2006), this does not mean that prior online educational environments have to be rebuilt, but the cognitive context where learning occurs must be allowed to reshape the learning environment. The shift required to accomplish this change must be personalized according to the needs and competences of the learner. A door to enter experiences as well as the glue that supports learner mastery allowing for opportunities to easily jump across formal, informal, unexpected, and intentional opportunities for learning needs

to be provided (Conner, 2004). The new framework must originate from our technology usage tendencies. According to Turcsanyi-Szabo (2012), a redesigned framework for learning must originate from web technologies that impact our daily lives, technologies that change the role of the educator and personalizes learning facilities for active learners.

Siemens (2004) proposed several guidelines for designing learning materials for the learner, based on the Connectivist Theory. (1) Allow learners to explore and research current information in order to develop the ability to acquire current information to build a valid and accurate knowledge base. (2) Provide opportunities for learners to unlearn old information and mental models and learn current information and mental models. The information learned today may not be valid tomorrow. (3) Encourage the skill of identifying important information from unimportant information. (4) Recognize what knowledge is no longer valid in order to acquire new knowledge by keeping up-to-date and networking with others in their respective field. (5) Understand globalization and the opportunities to share and review diversity in opinions. (6) Partake in learning through multiple sources interwoven with different communication technologies. Mukhopadhyay and Parhar (2001) affirm learning should be delivered in a multi-channel way and embrace multiple communication technologies in order to facilitate optimal learning. (7) Create awareness of computer systems and the training provided by the device or program. (8) Adopt a lifelong learning mentality. Knowledge in individual fields is constantly changing in part of the information explosion provided by technology. Schmidt and Werner (2007) add that instruction must be designed for authentic and experiential learning. (9) Embrace the concept that learning and technology are taking on a multidisciplinary persona. Learners must be exposed to different fields in order to develop connections. Siemens (2004)

suggests educators in light of a networked society reflective of globalization and change, seek ways to design learning materials to prepare students to function in a digital and networked era.

Web 2.0

The 21st century is focused on bringing up a society with the required competencies necessary to follow quickly developed tools necessary to be successful in the workplace and learning environment. By using Web 2.0 tools, the learner is actively participating in the task, engaged with the learning content, connecting new knowledge chunks with a current knowledge base, applying new connections to areas of established learning, conceptualizing experiences and evaluating outcomes with the purpose of contributing wisely to the collective knowledge of the learning group (Turcsanyi-Szabo, (2012).

Unlike Web 1.0 tools focused on providing a source or means of communicating information, Web 2.0 allows a way to create information and construct knowledge. These technologies allow a shift from consumers of knowledge to producers of knowledge. According to Hicks and Graber (2009), there are several characteristics of 2.0 usage including collaboration, conversation, community, and control. The opportunities to create and share with others are endless; there is no longer a sole control source of the tool. Web 2.0 tools change users from passive to active and allow for users to have an online voice (Hicks & Graber, 2009). This paradigm shift of web usage can be recognized on three levels. According to Cormode and Krishnamurthy (2008) the differences are technological in that presentation software is rendered to allow for user interaction; structural in that the purpose and layout of sites has changed; and sociological in that the notion of friends and groups has been developed.

Web 2.0 tools have provided collaboration technologies at minimal cost that were formerly available solely to wealthy entities. Academic institutions are experimenting with these

technologies to improve student learning experiences, prepare them for a world where collaboration is the avenue to accomplish work in a world without time and geographic differences (Rienzo & Han, 2009). Web 2.0 tools have the potential to enrich content and instruction in college courses. According to Lockyer and Patterson (2008), the popularity of collaboration software in social networks and the availability of these free tools motivate educational organizations to electronically connect, collaborate, and prepare learners for the world. Prior to the development of these tools, communication was one-sided. Programmers posted content, but the virtual world was not able to contribute or comment. This new realm of tools has changed the way online interactions occur. Hauser (2007) states Web 2.0 is an environment abundant with opportunities to create content, share information, communicate and collaborate differently, and self-publish. The characteristics of this medium are focused on, created by, and controlled by the user. According to Breeding (2007), an environment is created that focuses on the user, embraces static content, seeks contributing content from other users, and provides opportunities for engagement, participation, and collaboration. Educators have taken notice of these inexpensive and accessible technologies and are realizing the potential they have for promoting collaboration and critical thinking. According to Driscoll (2007), using technology to connect and collaborate with countries provides learners with a greater global perspective and allows for an enhanced understanding and appreciation of education in new contexts. As we become more globalized it is imperative we continue to provide opportunities to learners to connect with the world. New technologies are providing the pipeline necessary to be contributors to the 21st century. Web 2.0 tools have the potential to transform learning and provide the means for students to acquire the skills determined necessary by the Partnership for 21st Century Skills developed in 2004. The proficiencies included in this framework include

critical thinking and problem-solving skills, communication skills, collaboration skills, contextual learning skills and information and media literacy skills (Gooding & Morris 2008). Richardson (2007) reaffirms the potential to impact learning and provide a foundation of 21st century skills.

> Web 2.0 technologies address 21st Century Skills because they require the ability to find relevant sources of information, to assess the trustworthiness of those sources, to coherently engage with the ideas those sources offer, and to make transparent your own experiences and ideas in ways that leave opportunities for others to engage (p. 150).

To successfully implement the use of these tools in online settings educators must examine the manner in which courses are taught. Adding web 2.0 tools in academic realms requires instructional shifts. Online course design continues to replicate that of a traditional design where students are passive and simply transfer knowledge. Students desire to have social opportunities to engage in dialogue. According to Greenhow et al. (2009), the concept of classrooms must be broadened to posit learning as being located in contexts and relationships rather than in individuals. Learning ecologies must be developed to allow for opportunities to create and participate across formal and informal settings in order to enhance learning (Greenhow, 2009).

Incorporating Web 2.0 tools into the online learning environment has the potential to impact student achievement. These technologies support active and social learning, provide opportunities and venues for student publication, provide opportunities to provide effective and efficient feedback to learners, and provide opportunities to scaffold learning in the student's Zone of Proximal Development; all characteristics in alignment with constructivist theory. Web 2.0 tools depend on user contributions and interactions, providing opportunities for connectivity

and collaborative environments both considered as essential elements in a constructivist learning environment. In addition, research on publishing work indicates students who share their work are more likely to possess positive attitudes toward content areas, increased motivation levels, and increased student achievement (Schofield & Davidson, 2002). Student publication can also result in more reflective learning environments supportive of individual growth and development, clear and purposeful visualization of work, and opportunities to share work and solutions visually (Simoes & Gouveia, 2008). Furthermore, Web 2.0 tools provide opportunities for increased interactions amongst teachers and students, but also provide a platform for interacting with more knowledgeable experts such as parents or subject matter experts, greatly enhancing opportunities to scaffold learning (Hartshorne & Ajjan, 2009).

With a multitude of potential benefits academically, it is imperative instructors recognize the need to modify pedagogical approaches in order to yield success from Web 2.0 implementation. According to Huang and Behara (2007), instructors must modify practice and acknowledge the following: they personally are no longer keepers of knowledge with the role of transferring knowledge to students; they, as instructors must shift their role to facilitator. Teachers must broaden course preparation beyond refining a lecture; instructors must identify relevant and useful web content, moderate the student interactions, and interpret the knowledge acquired by students. Additionally, instructors must preview tools and anticipate learning and privacy issues. This shift to facilitator is constantly evolving with the learning of new Web 2.0 tools. The opportunities to impact learning in meaningful ways are evident. Web 2.0 technologies and their increasing use in higher education provide unique opportunities for increased engagement in the learning environment (Li & Pitts, 2009). Instructors need to scaffold instruction and provide guidance for students throughout the use of these tools.

Research by Cifuentes and Xochihua (2011) recommends the following precepts to enhance cognitive flexibility: differentiate assignments according to learner's prior experience using Web 2.0 tools, scaffold self-regulation and provide direction for learners' cognitive processing, develop rubrics that clarify expectations for each assignment and utilize rubrics to provide constructive feedback, provide for continuous opportunities for peer dialogue regarding course readings and assignments, and most importantly apply opportunities to view and critique one another's work and revise and resubmit work based on peer and instructor feedback.

A Minnesota Office of Higher Education Report (2009) evaluated evidence-based practices in online learning environments and reflected the use of Web 2.0 tools increasing in popularity. The report cited this shift due to increased flexibility and access to content and instruction without time or location constraints. In addition, the report indicated using these tools impacted instruction in the following ways: increased availability of learning experience for those not in traditional classroom settings, opportunities to assemble and dismantle instructional content more cost-efficiently, and potential for instructors to handle more students while maintaining instructional quality synonymous to that in face-to-face instructional settings.

Researchers recommend continued study in the areas of Web 2.0 usage in the classroom. According to Craig (2007), students will begin demanding a more responsive set of learning tools, utilizing this type of tool will allow us to engage our students through experiences both transformative and empowering in nature. Hartshorne and Ajjan (2009) recommend additional research in the examination of faculty use of Web 2.0 tools in courses as well as what support structures are in place for those implementations. Enonbun (2010) proposes the following suggestions to assist higher education in shifting their pedagogical focus to align with Web 2.0: modify instruction from traditional to highly flexible and interactive classrooms utilizing the

internet to prepare learners for global existence, include more Web 2.0 tools in the curriculum to prepared and competitively position learners for the future, diminish classroom boundaries and create boundless opportunities allowing the classroom to be available 24 hours a day, re-train instructors to accentuate relevance and viability of Web 2.0 tools in the school curriculum, de-emphasize the notion of instructor being the keeper of knowledge in academia as this mindset stifles the learning process and diminishes the opportunity for students to develop their competencies.

Social Networking

Social networking sites have become a popular means of communication the past few years. Social networking sites are web-based services allowing individuals to create a profile within a system, share a list of others of whom they connect, and interact with those connections (Boyd & Ellison, 2008). According to Cachia, Compano, and Da Costa (2007) these sites facilitate interaction among members by providing a dynamic platform that allows sharing and discussing of content and organization of activities and events. In the student realm socializing with peers and establishing a peer network are essential components of an educational experience. Past research indicates the social component is significantly weakened in the online learning environment because students lack opportunities to engage with others in a real-time environment (Nicholson, 2005). As more universities offer online courses it is important to examine the impact of the social component of learning. Deficiencies in social interactions promote a need to take notice and provide strategies to compensate for the isolated nature of online courses (Luo, 2010). Several studies examine better ways to provide social connections with students and their peers and students and their instructor.

Researched paved by Vygotsky (1981) and reiterated by Weigel (2002) suggests the use of learning communities to strengthen social bonds, learn viewpoints of others, develop awareness of different perspectives, and eventually assist in raising retention rates. Although the importance of community in the online learning has been examine, further research is needed to examine the social values of those online communities. Nicholson (2005) indicates online classroom interactions are mostly based on the course content and social communication is not evident. Research comparing online with a social component versus online without a social component, emphasizes the need to incorporate additional social opportunities. Kazmer (2007) compared a traditional online course with an online program including a residency requirement. Kazmer's findings indicate the program without the residency component had less of a sense of community, less desire for engaging in groupwork, and less development of friendships. Nicholson (2005) proposed a community scaffolding framework to employ technologies to further student involvement in learning communities. The framework emphasized the importance of building bridges from the internal components of the course to external communities offered through social networking tools.

Most social networking sites are designed to be user-friendly, but require some foundational instructions. Luo (2010) recommends providing tutorials to students on how to effectively use the sites to stay connected with their peers. Accessible tutorials with generate interest and increase opportunities for involvement. Rheingold (2008) suggests students are versed in five literacies of social media. The first is attention, students need to be trained on when and where to place their attention, if this knowledge is missing, it may be easy for students to become overwhelmed and unfocused in the social media world. Second, participation, students need to know how and when to post comments of a helpful and appropriate nature.

Third, collaboration, online communities are designed to thrive with collaboration, collectively a network's members must embrace other's contributions to the network. Fourth, network awareness, students must be literate in how to navigate through the settings of the social media tool used. Fifth, critical consumption, the ability to sift through and evaluate information and determine what is relevant.

Social networking sites have the potential to help students develop the social component necessary to feel connected in the online class environment. These sites are helpful for students to link the experiences gained in online courses to external experiences. Social networks have the potential to plant seeds for future productive professional networks that can benefit future careers (Luo, 2010).

Blogs

One Web 2.0 realm receiving attention in recent years is blogging. According to O'Brien, Aguinaga, Hines, & Hartshorne (2011), the term blog is short for web log and includes certain dated text or media on a specific topic accessible from anywhere students have access to the internet. Blogs allow for multiple avenues of communication, including providing a platform in which others can comment on the post. The authors state the most recent entry appears first, and posts may include links to other images and websites, but generally they offer a means for others to share commentary on specific issues. Wang and Hsu (2008) add that blogs possess several distinguishing features: ability to be set to a private setting, option to be cited or linked to by the public, opportunities to be categorized, and potential for students to invite others to participate. Wang and Hsu (2008) emphasize the potential for blogs to offer greater flexibility and a richer learning environment than those offered by traditional course management systems such as Blackboard. Blogs may also serve as an avenue to showcase student work and become

an effective method pedagogically for motivating students, promoting reflection, and improving attitudes toward the subject matter (O'Brien, Aguinaga, Hines, & Hartshorne (2011).

Past studies address student's perceptions of blog usage rather than providing empirical evidence of the impact of this tool on learning. A few studies examining blog usage in higher education settings yielded results of increased student motivation, interaction, and ethical behaviors in the area of writing. Additional studies yielded results of students learning to form evidence based arguments and express opinions through the use of blogs (Hsu and Wang, 2008). Further studies found students showed significant increases in knowledge levels, interest in continued learning of the subject matter, and appreciation of academic development (Wilder & Merritt, 2004). In a study conducted by Hsu and Wang (2011), blogs were found to provide easy access for monitoring student reading comprehension and organizational skills, provide ways to track use of reading tactics learned, enhance interaction amongst peers, and provide a platform for voicing their opinions. In addition, Hsu and Wang (2011) reported blogs were an easy way to integrate multimedia into assignments. Allowing for student interaction beyond the parameters of the online classroom through blogging allows for additional learning and teaching opportunities. Hsu and Wang (2011) reaffirm this idea by summarizing results from a study analyzing the impact of blogs on college students: blogs enable instructors to see how prior knowledge could affect their understanding and communication of the same topics, and they facilitate increased interaction among students. In a mixed-method study, Nicholson et. al (2007) found increases in student perceptions, knowledge level, interest in further learning and value toward academic development. In addition, qualitatively, Nicholson found students demonstrated critical reading, thinking, and writing skills through blogging. In sum, Nicholson found several positives from the blogging experience. Students responded appropriately to task

demands, demonstrated critical thinking when analyzing others ideas, provided beginning evidence of weighing others points of view, and illustrated an emergence of academic language in postings.

Research on the use of blogs in the classroom suggests both academic and social benefits as well as additional opportunities for instructors to engage in dialogue and track student progress. A study conducted by Cobanoglu and Berezina (2011) suggests students increase the amount of writing they submit when blogging due to preferring technology-based assignments and spending more time on assignments when they are produced through a platform viewable by others. Cobanoglu and Berezina (2011) recommend instructors use blogs as an interactive way to conduct conversations outside of class time.

Twitter

Twitter is a social networking tool that allows people to share information, in a real-time news feed to like-minded individuals (Mistry, 2011). These messages, known as tweets, are limited to 140 characters and have the potential to be a powerful avenue for educators to publish research, communicate with students, connect with a learning or scholarly community, or signpost followers to resources and research (Weberg, 2009). According to the Twitter webpage, Twitter is a service for friends, family and co-workers to communicate and stay connected through the exchange of quick, frequent questions and answers. Twitter has streamlined their approach to social networking by focusing on short length updates and creating micro-blogging within a web-broadcast realm (Keenan, 2009). Users subscribe to others feeds to receive updates. Other users or friends may be added by invite. Users must receive permission from others before subscribing to their feed. Like most social networking tools, Twitter has multiple options for user privacy. Twitter also integrates with mobile devices. According to Snyder

(2008), Twitter is the fastest growing social network in the world. The process of micro-blogging has become a phenomenon to which some attribute to its simplicity. Twitter offers sociability through simplicity (Keenen, 2009). According to Stutzman (2007), Twitter has been labeled as anything form a microblogging application to a continuous presence notifier to a viral, social instant messaging client gaining the attention of a wide portion of the population.

Many mainstream uses of Twitter include groundbreaking news, marketing moves, celebrity updates, technology tips, politics and other updates from social sources. Gibson (2010) acknowledges Twitter was originally visioned for usage by the general public and for social purposes only. Academia embraced the use of the tool and found creative ways to use it. Some current integrations into education include the Back-channel chat where conference participants provide feedback regarding the proceedings of the conference or links to keynote addresses (Hargadon, 2009). When following webinars participants may post specific keywords and other participants search and post comments based on the keywords (Mullings, 2009). Class chatter allows student to continue topics outside of the classroom (Parry, 2008). Twitter uses may follow professionals who are experts on specific topics of events. The tool may be used for writing assignments in which one student tweets and others add to the tweet to generate a story or poem. The track a word feature allows the user to receive notification of any post including the said word. Students can engage in international projects by invited students across the globe to contribute to collaboratively written stories (Parry, 2008).

As with any social media tool, Twitter also has some drawbacks. Gibson (2010) discusses issues with marketers and pornographers consuming the platform and posted unwanted messages. Trending topics may also include explicit or offensive material. Additionally, the amount of tweets can be overwhelming, tools like tweetdeck.com can be used to generate groups

based on user preferences. The user must also keep posts intentionally short so sites such as bit.ly or snipr must be used to truncate long URLs. Also, retweets or messages often lose context because the full thread is often lost (Gibson, 2010)

Twitter has the potential to impact online courses and remedy the deficiency of social interaction. Skiba (2008) views this tool as a viable platform for metacognition, forcing users to be succinct and precise, an important skill in thinking clearly and reflecting on one's practice. Reflecting and sharing those reflections can be useful in creating authentic learning environments. This popular microblogging application presents opportunities to reframe communication among students and their peers and students and their instructors through settings both curricular and non-curricular (Reinhardt et al. 2009). In courses with many students, tweeting enables an immense amount of interactivity and enriches the course section (Ebner, 2009). Millenial learners desire connections with peers. Research indicates these learners feel most engaged when receiving information from multiple sources during the same time period (Wankel, 2009). Students appreciate receiving instant feedback from their tweets.

Students in online courses desire interaction. These interactions may be classified into 5 types according to Fox and Varandarajan (2011): learner-content, learner-instructor, learner-learner, learner-interface, and vicarious interaction. Learner-content interaction is described as that involving the learner intellectually interacting with content, resulting in a change of the learner's perspective, understanding, and mind. Learner instructor interaction occurs between the student and the facilitator of the content. Learner-learner interaction occurs between individual students or student groups and occurs when the instructor is not present. Learner-interface interaction focuses on the importance and reliability of the technology and its need to function in a way that does not impede other interactions. Vicarious interaction occurs when the

learner observes and processes interactions between other learners or other learners and the instructor.

Twitter and Social presence

The social aspect of learning is an essential component. According to Dunlap & Lowenthal (2009) learning management systems offer several tools that support engagement and social learning, the functionality, scope, and structure may inhibit real time connections and interactions. In online settings educators strive to build in content that is relevant and allows for social connections amongst students and the instructor. Theoretically, learning as a human activity occurs within social parameters. These parameters promote higher cognitive processes (Vygotsky, 1978). Contact between students and instructors in and outside of class is critical for engagement as it influences motivation and involvement (Dunlap & Lowenthal, 2009)

Social presence is well established in the online education literature as a way of thinking about social interactions and connections and learner engagement in the online setting (Dunlap & Lowenthal, 2009). The concept of social presence is not new and is rooted in communications media effects on communication. According to Short & Christie (1976), social presence originally was used to describe the degree of salience between two communicators and the communications medium used. Researchers have shown the impact of social presence in varying degrees. Gunawardena (1995), and Richardson and Swan (2003) examined the relationship between social presence and student satisfaction. Rourke, Anderson, Garrison, and Archer (2001) and Rovai (2002) studied social presence and its role in developing a community of learners. Richardson and Swan (2003) researched social presence and learner perceived learning. With historical results providing a framework for the importance of social presence it

is logical researchers continue to examine ways to integrate opportunities for social presence into the online setting.

Past research has examined ways to maintain social presence in online courses. Aragon (2003) identified ways to create social presence using audio, video, posting of student introductory information, and providing frequent feedback. Although the benefits of social presence have been examined in the area of student satisfaction, the literature is beginning to grow and suggest an influence on learning outcomes as well emphasizing the importance of creating a social connection within online learning environments. Duvall, Hodge, and Ellis (2007), examined the use of text messaging to improve social presence. Data from the study indicated the students enjoyed using text messaging and felt that it was useful for enhancing communication in their online class. The collaboration and communication created through the use of text messaging enhanced the creation of a social context while growing a sense of community within the course (Duvall, Hodge, & Ellis 2007). Using the text messaging tool allowed teachers and students to actively participate in the learning process.

Researchers have begun to examine the use of Twitter as a tool to maintain social presence in the online setting. Multiple studies have begun to examine this impact has on instruction, engagement and achievement. Parry (2008b), found Twitter to be an effective classroom tool as it blurred the boundaries of the classroom. Parry concluded using Twitter in his instructional design and technology courses enabled just-in-time communication with a local and global community, specifically his course and practicing professionals. He indicates students engaged in sharing, collaboration, brainstorming, problem-solving, and creating within the context of Twitter (2008b).

In addition, Twitter was found to have other instructional benefits as indicated by Dunlap and Lowenthal (2009). Twitter allowed a platform for answering student issues in a timely manner. Writing concisely was encouraged and allowed students to grow this professionally useful skill. Writing for an audience was reinforced as students learned to be sensitive to their audience and discern the perspectives and ideas appropriate for public contribution. A great benefit to using Twitter was found in connection with and receiving immediate feedback from professionals in the field. Informal learning was enhanced as students discovered supplemental sources to enhance understanding of course content. Ongoing relationships were established as students connected with other classmates and faculty. These relationships allowed students to continue interacting with one another beyond the confines of the semester.

Dunlap and Lowenthal (2009) recommend following several guidelines for successful implementation of Twitter in an academic setting. (1) Establish relevance for students; develop a clear personal, academic, and professional purpose for using the tool. (2) Define clear expectations for participation. (3) Design tangible, measurable assignments. (4) Model effective use of the tool. (5) Actively participate as the instructor. (6) Build Twitter collected data into assessments. (7) Encourage and reward students for embedded information gleaned from Twitter into course projects. (8) Continue to actively participate in Twitter at the conclusion of the course in order to assist students as an academic consult available for advising, coaching, and mentoring.

Retention

Student retention in online courses is of continuous concern to college administrators. As online course offerings become more prevalent, researchers need to understand what

instructional tools must be a part of the course design. Foundational research on retention by Tinto (1975) suggests the following:

> The process of dropping out from college can be viewed as a longitudinal process of interactions between the individual and the academic and social systems of the college. A person's experiences in those systems (as measured by his normative and structural integration) continually modify his goal and commitments to the university in ways leading to either persistence and/or to varying forms of dropout (p. 94).

A student's opportunities to interact with both peers and the instructor are an essential component of retention. Tinto (1975) states the student's commitment to the institution is influenced my multiple factors. Several of these factors are molded by academic experiences including the following: academic system (grade performance, intellectual development) and social system (peer-group and faculty interactions). Ultimately experiences can influence the decision to persist or dropout (Tinto, 1975). Other studies have indicated the importance of integrating students into the academic and social environment. Research by Bean and Metzer (1985) found academic variables and social integration to be influencing factors in retention. Tinto's retention model (1993) concludes that incongruence, or the point students no longer feel compatible with the institution or feel isolated are key predictors to the decision to drop out of undergraduate programs. Multiple researchers have used Tinto's or Bean and Metzer's mode to assess variables impacting student retention at community colleges (Bers & Smith, 1991, Feldman, 1993; Windham, 1994). According to Chaves (2006) colleges must understand the importance of academic and social integration for all students, including adult students. In addition, Chaves states in order for retention to occur, curricula redesign must offer adult opportunities for self-directed study outside of the classroom.

The literature notes various reasons for dropouts of online courses. Galusha (1997) summarizes the reasons into four categories: student barriers, faculty barriers, organizational barriers, and course considerations. Most research on faculty barriers indicates insufficient training related to technology usage and course design. Garland (1993) indicates there are four key reasons given by students for withdrawing from distance education courses: situational, consisting of problems arising of the personal nature; dispositional, personal problems influences persistence to complete the course; institutional, difficulties encountered with the institution; epistemological, difficulties apprehending the course content. Garland's research indicates situational and dispositional barriers are the primary causes for attrition in online courses.

Recent research by Tinto (2006) indicates retention is a highly discussed topic in the higher education setting. However, as administrators emphasize retention recent trends show rates decreasing. Lederman (2009) found retention rates from freshman to sophomore years sunk to the lowest rate in 25 years. Retention has become a focus for institutions as they continue to examine the needs of students and the increased accountability measures for higher education. The topic of retention is complex as students, curricula, and accountability are constantly changing. Tinto (2006) indicates the components for retention are constantly changing as institutions and student expectations for learning change. Students are expecting flexibility in course delivery options and desire online courses. Research by Allen & Seaman, (2007, 2008) affirms this desire. However, research on online student retention rates indicate students drop these courses at a higher rate, flawing the retention rate even more.

Raising the learner's social presence and understanding their expectations for online learning is a critical component of increasing retention in this learning environment. Reio and Crim (2006), recommend education stakeholders understand the experiences and perspectives of

online learners. In addition, how important this understanding is as students make individual decisions about the value and sustainability of online learning for themselves based on their experiences and the impressions those experiences make on them. Reio & Crim (2006) indicate examining student perceptions of asynchronous online courses and their potential to convey social presence should provide insight into the importance of interaction and participation into online courses. Student satisfaction with courses will then impact their decision to enroll in future courses.

Summary

Online learning affords students many advantages such as time and location. Levy (2007) indicates students attending online courses drop out at a substantially higher rate than those in on campus courses. Online courses must establish social presence and afford students opportunities to engage in meaningful dialogue and extensions of learning. Web 2.0 tools have the potential to change online instructional opportunities by providing students with a learning platform conducive to interaction with the content, peers, and instructor. In addition, Web 2.0 platforms offer opportunities for students to engage in knowledge production.

The Constructivism and Connectivism theories of learning support the addition of these tools into the learning environment. Learners do not have full control over what they learn since others in the network are continually changing information, this process requires new learning to occur as well as requiring the unlearning of old information (Anderson, 2008). According to Huang and Behara (2007), instructors must modify practice and acknowledge the following: they personally are no longer keepers of knowledge with the role of transferring knowledge to students; they, as instructors must shift their role to facilitator. Teachers must broaden course preparation beyond refining a lecture; instructors must identify relevant and useful web content,

moderate the student interactions, and interpret the knowledge acquired by students. Incorporating Twitter provides students with the opportunity to learn beyond the course management system by engaging in real time communication and by connecting with experts in their content area.

Chapter III

Description of Methodology

The study examined two groups of public university students to better understand the academic impact of implementing Twitter into the online class setting. The comparison group participated in the online course in a conventional manner using the institution's course management system, Blackboard. The treatment group participated by using the institution's course management system, Blackboard in addition to Twitter. The purpose of Twitter usage was to provide a platform for course-related discussions, support, and information sharing. The data collected examined student perceptions of academic achievement when using Blackboard and Blackboard and Twitter. The theoretical basis of this study was Siemens' Connectivism Theory. This theory encompasses nine principles to determine how learning changes when knowledge growth is overwhelming and technology replaces many basic tasks previously performed by people (Siemens, 2006).

Research Question

The need for continued research to examine whether social networking tools can increase student interactions and academic performance in online courses has been established (Junco, 2010). This study addressed that need by examining the following research question:

Does the implementation of Twitter improve student perceptions of academic achievement in online courses?

The study took into account student demographic information and survey data. The usage of Twitter and determination of perceived achievement is described further in the research design and data collection sections.

Research Design

Survey research was used to collect and analyze student data from a regional, state university. The instruments were developed by the researcher to determine if student perceptions of learning in online courses improved when using Twitter. The vice president for academic affairs at the university where the study took place was contacted for approval to conduct the study. The Research Review Board approved the study. Professors who taught online courses on the campus were contacted and provided the goals of the study, instructional resources and support for using Twitter in the classroom, and a schedule of deadlines for the study.

The study applied a survey design to examine the possible academic impact of Twitter usage in an online learning environment. Two different surveys were piloted and tested before being administered to the two different groups of students. Students in courses using only Blackboard were given a survey with questions relating to Blackboard only. Students in courses using Twitter were given a survey including questions on Blackboard and questions on Twitter. The study compared two groups of students by examining student perceptions of using Blackboard in classes and student perceptions of using Twitter in classes. Data were collected through online self-administered surveys taken by students enrolled in the online courses selected for the study. Data collection occurred during the mid point of the semester. Differentiating between the two groups allowed the researcher to examine the relationship between Twitter usage and academic achievement. The dependent construct in this study is student perception of achievement. The independent variable is the use of Twitter.

Target Population

The higher education institution used in this research is a public, four-year university located in the Midwest. The target population included students enrolled in an online class with two separate section offerings. Only courses with two online sections were used in the study. Same content area, online courses were compared as one course integrated Twitter and Blackboard into the online learning and the other only integrated Blackboard into the online learning. Student perceptions of achievement were measured for both groups.

Selection/Sampling

The larger the sample population is, the smaller the sampling error (Creswell, 2009). In order to minimize sampling error, this study sampled general education online courses with an instructional design functional to incorporating Twitter and with instructor agreement to participate. Instructors were invited to participate in the study via email and received information on the expectations for participants. A follow up email was sent to encourage additional instructors to participate. A third email was sent specifically to instructors who had not responded. Six instructors agreed to participate in the study. Participants included 163 students enrolled in general education courses not requiring a face-to-face component at a public, four-year university located in the Midwest. Participants were selected through the process of convenience sampling. Pre-existing groups of students in online settings were selected. The researcher had no control over which students enrolled for each class and students did not possess prior knowledge as to whether their class would incorporate Twitter or not. Therefore, no bias was introduced in student assignments. The sample of online students represents the total group of students taking online classes at a four year, public university in the Midwest. The

group participants were enrolled in different sections and courses. The two groups of participants4 had little to no interaction with one another essentially avoiding contamination.

Instrument Reliability and Validity

The survey instruments were tested for validity and reliability prior to administration. The researcher created the two survey instruments to measure the impact of Twitter on student perceptions of academic achievement. The Blackboard survey contained questions related to Blackboard only in order to gain an understanding of student perceptions of the tool's impact on learning. The Twitter survey contained questions on Blackboard and Twitter in order to gain understanding of student perceptions of how Blackboard and Twitter impact learning. The surveys were self-administered to all participants in the study during the seventh week of the semester. Multiple steps were taken to ensure reliability and validity for the two surveys. To ensure content validity the instrument including questions from both surveys was administered to 5 experts including one professor whose expertise is statistics, one professor whose expertise is mathematics, and three professors whose expertise is teacher education. Respondents were asked to review each question on the survey and evaluate them on a three-point scale, Good Match (1), Neutral (0), Does Not Match (-1). After each individual evaluated the survey including questions from both Blackboard and Twitter, the researcher conducted cognitive interviews and asked for feedback. Afterwards, individuals were offered the opportunity to provide further suggestions for improvement to the tool. The researcher conducted an exploratory factor analysis using SPSS to determine questions on the survey appearing to be effective and questions on the survey appearing to be problematic. The exploratory factor analysis also assisted in determining the unidimensionality of each survey. Once results were returned and an item analysis was complete the researcher reevaluated the questions and

determined the questions needing to be changed. Next, to determine confirmatory factor analysis, the instrument was administered to a pilot group to see if all questions were being answered as a single idea. At this point simple scores were evaluated and the process of eliminating questions was addressed. Reliability coefficients were computed for the instrument to determine which alphas were acceptable. Cronbach's alpha is a widely used reliability coefficient used to estimate test-score reliability from a single test administration using information from the relationship among test items. Coefficient alpha provides a reliability estimate based on the covariation among items internal to the test; hence it is also called an internal-consistency coefficient (Webb, Shavelson & Haertel, 2006).

Validity was established through the assumption of repeatability. The content validity of the instrument was based on expert ratings of the items in the instrument. Construct validity was based on the degree to which the scores statistically behave.

Questions too lengthy or not relevant to the respondent were considered for elimination from the survey. The survey directed the two groups to the correct path of questions. The Blackboard only group was asked to skip the questions pertaining to only Twitter users. Questions in the demographic section were designed to collect characteristics of both groups and develop an understanding of the characteristics of each group's members. The Research Review Board (RRB) approved the survey prior to its dissemination to students.

Data Collection Procedures

The survey instrument was administered to students in the selected general education online courses (Appendix B). The online survey contained quantitative and qualitative information. All students in the identified online courses that agree to participate in the study were surveyed using the Student Survey located in (Appendix B). The survey included questions

divided into two categories including demographic and course questions. Prior to taking the survey students received a letter on Blackboard explaining the purpose of the survey, instructions for completing the survey, explanation of confidentiality/anonymity policy, rights to opt out of participating in the study, and contact information for questions pertaining to the survey or study. Approximately one week after the initial Blackboard announcement, an email reminder was sent to those who had not yet replied.

Twitter was made available to students selected to be in the Twitter group. Instructors in the group using Twitter directed students to create a Twitter account via course announcement in Blackboard. Instructors disseminated an assignment via Blackboard for students to complete as well as participate in discussions via Twitter with classmates, the instructor, and experts in the course content area. In addition, the instructor posted Twitter related hyperlinks, including a tutorial to assist students in creating and using their Twitter accounts. The tutorial assisted students in signing up for the account and understanding how to tweet and reply to others. Students created accounts and posted their Twitter user name in the Discussion Board area of Blackboard and began following classmates and the instructor. Instructors followed students and engaged in course related dialogue. Students in the Twitter group were invited to participate in the online survey via a Blackboard announcement.

Instructors selected to be a part of the Blackboard only group used only the course management system, Blackboard. The participants in the comparison group did not engage in the use of Twitter during this course. Participants in this group received an announcement via Blackboard inviting them to participate in the study and take the online survey.

The data for the study were collected via an online survey. Participating instructors received an explanatory letter including the link to the survey. The instructor posted the survey link on

Blackboard during the seventh week of the semester. In addition, the instructor communicated the date for survey completion. The survey invitation specified the anonymity of the survey as well as the time required to complete the survey. Additionally, students were encouraged to be truthful in their responses and were assured that their grades would not be affected by their responses.

Data Analysis

The study conducted attempted to answer the research question, "Does the implementation of Twitter in online courses impact student perceptions of achievement in general education courses?" The study conducted also attempted to answer the research question, "Does the implementation of Blackboard in online courses impact student perceptions of achievement in general education courses?" Inferential statistical analyses were used to apply gathered results to the larger population. Survey data was downloaded and opened using SPSS. Data was cleaned and exploratory data analysis conducted. Descriptive results including sample attributes along with means and frequencies for each variable was reported. A factor analysis was conducted to uncover patterns in the relationships among variables. A description of each category surveyed was written and analyzed based on its relationship to the research question. Multiple *t* tests and One way ANOVAs were conducted to verify whether the differential treatment produced differential effects and whether there were significant differences between groups in terms of the dependent variable.

Quantitative/Expert Judgment

Experts in higher education reviewed the survey for content validity. Five experts evaluated the survey questions. The five education experts have taught courses in the field of teacher education. Each expert has multiple years experience in teaching. One of the experts is

the Dean of the School of Education and has expertise in teacher education, physical education and statistics. Another expert has expertise in counseling and language arts. The third expert has a background in social sciences and teacher education. The fourth expert has a background in elementary school administration, literacy, and teacher education. The fifth expert has a background in mathematics and teacher education. All experts are employed as Associate Professors and Professors at a four-year university located in the Midwest.

An Index of Item Objective Congruence was done by the panel of experts who reviewed each question to determine content validity for the section of the survey evaluated. The survey was divided into a Demographic section including 7 questions, and an online learning section divided into a Blackboard section including 9 questions and a Twitter section including 9 questions.

Respondents were asked to review each question and rate them on a three-point scale, Good Match (1), Neutral (0), Does Not Match (-1). Seventy-six percent, 19 of the 25 questions rated a perfect score of 1. Twenty percent of the questions (numbers 16, 22, 23, 24 and 25) had one rating of Neutral each translating to a score of .83. One percent (question number 13) of the questions had two ratings of Neutral each translating to a score of. 67. All questions scoring something other than a 1 were found in sections two and three of the survey. One respondent did not provide an answer for 7 of the survey questions. Overall, no survey items scored below a .67 index. No changes were made to any survey question and all questions were retained for the survey pilot. The following table shows how each question was rated by the reviewers.

Table 1
Index of Item Objective Congruence

Statement	Component
Q8	1
Q9	1
Q10	1
Q11	1
Q12	1
Q13	.67
Q14	1
Q15	1
Q16	.83
Q17	1
Q18	1
Q19	1
Q20	1
Q21	1
Q22	.75
Q23	.83
Q24	.83
Q25	.83

Note: Q8-Q16 questions relate to the Blackboard only survey, Q17-Q25 related to the Blackboard and Twitter survey.

Pilot Study

The researcher received approval with the department head of the School of Education at the participating university to conduct a pilot study in a Technology in Education online course. There were 26 students enrolled in the course. The students were invited to take the survey through Blackboard. Each of the 26 students took the pilot survey.

Pilot Study Reliability and Validity for the Blackboard Survey

Survey questions were piloted in order to determine reliability and validity of the instrument. Data collected from the pilot surveys were used to determine internal consistency within the instrument. Cronbach's alpha was used for this process. A high reliability coefficient indicates high reliability. The more reliable the test is, the more confidence the researcher has

that the scores obtained are basically the same scores that would be yielded if the test was readministered to the same test takers (Gay and Airasian, 2000). A principal component analysis provided further evidence of construct validity. This analysis determined how well the items related to the same factors. The sample for the pilot study was small. Additional care was taken by the test developer to interpret the statistical analysis in conjunction with expert ratings. A pilot test was conducted on a group of students similar to the study participants. Pilot data assessed reliability and validity through the use of coefficient alpha and principle components analysis. Using SPSS, a confirmatory factor analysis was done to determine if all questions were related to the same scale or idea (Table 2). Each section of the survey was tested for reliability using Cronbach's Alpha. Cronbach's alpha for the 8 Blackboard items was .91. For the questions pertaining to Blackboard the range was 8 to 32, the M was 25.6, and the SD was 5.1. The entire survey was run through SPSS and several factors emerged. The results revealed that some factors did not appear to load as theorized. The researcher believed all items were categorized into two scales. However, the data revealed the factors were acting as one scale. Consequently, the researcher ran questions 8-16 independently and 17-25 independently and both sets loaded as theorized.

Repeatability established both content and construct validity for the instrument. Content validity emerged from expert ratings. Construct validity was established statistically through the interpretation of scores.

Pilot Study Reliability and Validity for the Twitter And Blackboard Survey

Internal consistency measured the extent to which the items in a test are similar to one another in content. Cronbach's alpha is a measure of internal consistency showing how closely related a set of items are as a group. A high value of alpha is often used as evidence that the

items measure an underlying construct (Bruin, 2006). Cronbach's alpha for the 9 Twitter items was .94. For the questions pertaining to Twitter the range was 9 to 36, the M was 30.4, and the SD was 3.8.

Validity was established through the assumption of repeatability. The content validity of the instrument was based on expert ratings of the items in the instrument. Construct validity was based on the degree to which the scores statistically behave.

Further discussion and examination of the data reaffirmed the researcher's decision to conduct a split survey. It was decided the full study participants would be given the survey in two formats. The Blackboard group would take a survey including demographic information and Blackboard questions. The Blackboard and Twitter groups would take a survey including demographic information, Blackboard questions and Twitter questions. Using SPSS, a confirmatory factor analysis was done on both surveys to determine if all questions were related to the same scale or idea (Table 3). All questions were related to the same scale or idea. The entire survey would be disseminated to the experimental groups whereas the survey including demographic questions and questions 17-25 would be given to the other groups.

Table 2
Pilot Study Confirmatory Factor Analysis for Blackboard

Statement	Subscale Component
Q8	.779
Q9	.612
Q10	.696
Q11	.779
Q12	.772
Q13	.656
Q14	.514
Q15	.783

*Q16 not included in pilot

Table 3
Pilot Study Confirmatory Factor Analysis for Twitter

Statement	Subscale Component
Q17	-.036
Q18	.822
Q19	.923
Q20	.869
Q21	.932
Q22	.942
Q23	.782
Q24	.687
Q25	.902

Full Study Factor Analysis

A factor analysis was done to discover the patterns and relationships between the variables in order to develop consistent variables and validity for both groups. The factor analysis for the two groups were done independently as there were two separate survey instruments. A confirmatory factor analysis was also conducted on both surveys to verify all questions were holding to the main idea before administering the survey to the study participants.

Table 4

Full Study Factor Analysis for Blackboard

Statement	Subscale Component
Q8	.779
Q9	.612
Q10	.696
Q11	.779
Q12	.772
Q13	.656
Q14	.514
Q15	.783

Table 5

Full Study Factor Analysis for Twitter

Statement	Subscale Component
Q17	-.036
Q18	.822
Q19	.923
Q20	.869
Q21	.932
Q22	.942
Q23	.782
Q24	.687
Q25	.902

Full Study Selection/Sampling

The convenience sample consisted of students enrolled in online courses led by instructors who agreed to participate in the study. Six instructors agreed to participate in the study. Three instructors incorporated Twitter in conjunction with Blackboard. The other three instructors agreed to continue using the course management system, Blackboard in their online course. The participating online courses in the study included two sections of Oral

Communications, two sections of General Psychology, and two sections of Lifetime Wellness. In each of the courses, one section served as the treatment group and one section served as the control group. A total of 191 students were enrolled in the participating courses at the beginning of the semester. Prior to the middle of the semester, instructors posted an invitation for students to participate in the survey.

Demographic Characteristics of the Sample

The percentage of males and females in the sample population were not comparable to the percentage of males and females in the general population of online students enrolled at the university used in the study. In the Blackboard group 82.6 percent of the participants were female as opposed to 58.0 percent female at the university level. Additionally, only 17.4 percent of students in this group were male. Campus wide numbers reflect 42 percent of students enrolled are male. In the Blackboard and Twitter participant group 78 percent of those participating were female as opposed to 58 percent female enrollment campus wide.

The age distribution of the sample closely represented the overall general population of students enrolled at the university. The majority of the students were ages 17-22 while the second largest age group was ages 31-45. This data is fairly consistent with university data as the largest enrollments lies between ages 18-24. The Blackboard only group was comprised mostly of freshman, sophomores, and juniors whereas the Blackboard and Twitter group reflected the highest amount of sophomores and seniors within courses used in the study. Student time spent on course here varied between the two groups. The majority of the Blackboard only students reported spending only 1 to 2 hours online each week working on the course. The Blackboard and Twitter students reported spending 2 to 3 hours each week working on the course. Students who have taken an online class before was reported at over 80 percent for both of the groups.

Full Study Reliability

Using SPSS, a confirmatory factor analysis was done on both surveys to determine if all questions were still holding true to the same scale or idea. The researcher determined question 17 should be removed from the survey as it came back at -.036. Each section of the survey was tested for reliability using Cronbach's Alpha. Cronbach's alphas for the 8 Blackboard items and 8 Twitter items were .85 and .94, respectively. Internal consistency measured the extent to which the items in a test are similar to one another in content. All scales were high indicating survey reliability.

Repeatability established both content and construct validity for the instrument. Content validity emerged from expert ratings. Construct validity was established statistically through the interpretation of scores.

Data Collection and Survey Description

The online surveys were administered through QuestionPro, a web-based survey tool. Survey participants connected to the survey via a hyperlink on Blackboard. Survey data were downloaded to SPSS in statistical file format. Data were analyzed in SPSS to verify for correctness and remove any incomplete data. Descriptive statistics assisted in organizing, summarizing, and validating data points to determine what data was suggesting. Descriptive statistics assisted in determining the frequencies, counts, and proportions describing the demographics of the participants and how said demographics related to academic achievement.

Response Rate

There were 153 total responses for Blackboard and Twitter surveys utilized for analyzing the data resulting in an overall response rate of 80 percent. The survey completion rate for the Blackboard only group was 78 percent. The survey completion rate for the Blackboard and Twitter group was 86 percent.

Summary

Two surveys were used to collect data for the study. Students participating in online courses received the survey based on instructor agreement to participate. Students took the online survey based on whether or not their respective course included Blackboard of Blackboard and Twitter. The surveys used for the study were unidimensional. Measures of reliability and validity were used to ensure results were usable. Tests conducted indicated the constructs were holding together on each of the two surveys used. Survey question number 17 was not aligning to its intended scale. It is recommended this question not be used when using this survey in future studies.

Chapter three established the methodology for the study. The processes for identifying the reliability and validity of the two instruments were identified including expert evaluations of the survey, piloting of the survey, splitting the initial survey into two surveys and implementation of the full study. Statistical analyses were conducted over each phase of the study to ensure the instrument was holding true to its purpose. Chapter four encompasses a description of the population used for the study, the sampling method implemented, the data collection process, the response rate, and the description of the final sample and the treatment

and comparison groups. Following presentation of the research background, results addressing the research question will be presented

Chapter IV

Data Collection, Analysis, and Results

This quantitative study was implemented in order to measure the impact of Twitter use in an online class on student perceptions of academic achievement. The research questions guiding the study were: Does the implementation of Twitter improve student perceptions of academic achievement in online courses? Does the implementation of Blackboard improve student perceptions of academic achievement in online courses?

Two student surveys were used to identify student responses to each of the survey questions. Confirmatory factor analysis and reliability testing were used to analyze the response data for both surveys. Inferential statistical analyses were used to analyze data in order to apply results to larger populations. Calculations of mean, standard deviation, and confidence interval were conducted for questions on each of the surveys to determine what conditions were most favorable toward Blackboard and Twitter. T-tests and One-way ANOVA tests were used to test for statistical significance for questions in both the Blackboard and Blackboard and Twitter surveys. Additionally, Post-hot testing was conducted using Tukey's HSD to find significance among specific groups within the two surveys.

Results for all questions related to Blackboard were calculated together. Twitter survey results were evaluated independently. Mean scores and standard deviation were calculated for each question on the surveys in order to evaluate perceptions of Blackboard and perceptions of Twitter independently.

The study took into account student demographic information and survey data for students enrolled in college level, online courses. The researcher hypothesized the use of Twitter in online courses would increase student perceptions of achievement. The study does not

attempt to establish causality, but attempts to demonstrate the degree of impact Twitter has on academic achievement while taking into account the effects of covariates.

Chapter four encompasses a description of the population used for the study, the sampling method implemented, the data collection process, the response rate, and the description of the final sample and the Blackboard and Blackboard and Twitter groups. Following presentation of the research background, results addressing the research question will be presented.

Population Characteristics

The population consisted of college level students enrolled in an online class at a university in the Midwest during the Spring 2014 semester. The students enrolled were in a general psychology, oral communications, or lifetime wellness courses. The Blackboard only group included 139 students and the Twitter group included 64 students, totaling 153 students participating in the study.

Sampling Procedures

Students involved in this study did not have prior knowledge as to whether or not their online class would incorporate Twitter. The researcher was not aware of the students assigned to the two different groups. Student participation was connected to the instructor's willingness to partake in the study. The study compared the academic achievement of the two groups. The first group utilized Blackboard as well as Twitter for course activities. The second group utilized Blackboard only for course activities.

The two groups were differentiated as participants took a split survey including questions on only Blackboard or question Blackboard and Twitter. The treatment group participants were

asked questions based on their usage of Twitter and Blackboard in the course. The control group participants were asked questions based on their usage of Blackboard in the course.

The two groups were comprised of students enrolled at a university in the Midwest during the Spring 2014 semester. The instructors of the participating courses in this study reported on the numbers of students they had at the start and finish of the semester via email.

Characteristics of the Population and Sample for the Blackboard Participants

The demographic characteristics of the sample population in this study varied slightly in comparison to the demographic characteristics of the entire population of students enrolled at a university in the Midwest where the study was conducted. At the university, the most recent data reflects 58 percent of students are female, and 42 percent of students are male. The survey of participants using Blackboard only revealed only 17 percent of students enrolled were male, while 83 percent of students were female. There were more female students participating in the study than male students. In the Blackboard and Twitter group again female participation was higher with 79 percent female participation and 21 percent male participation.

The amount of freshman students participating in the Blackboard survey was 30.4 percent compared to 26.7 percent at the university level. The sophomore student participants were 34.8 percent and the number of sophomores enrolled overall at the university was only 16.9 percent. Participants who were juniors comprised 30.4 percent of the participants in the Blackboard group. The university has a population of 19.9 percent juniors. At the senior level, 4.3 percent of those participating in the survey fell into this category. Students at this university who were seniors comprised 24.5 percent of the total population. Overall, the amount of participants in each group was higher than the university demographics in each group except the senior level.

When examining the student age group in the Blackboard only group the researcher discovered the majority of the students participating in the study were ages 17-22 with 52.17 percent falling into that category. Students ages 23-30 compromised 13.04 percent of the group, those 31-45 comprised 26.09 percent of the group, and those 46 and over comprised 8.70 percent of the group. This data aligned closely with university data indicating the largest number of students enrolled as 20-21 year olds. University data also showed the lowest amount of students enrolled falling into categories representing students ages 50 and over.

Most students represented in this portion of the study indicated they had taken online courses before (86.96 percent) as opposed to those not taking online classes before (13.04 percent). Students reported spending various amounts of time logged on to the course. 4.35 percent of students indicated they spent 0-1 hours online, 39.13 percent indicated they spent 1-2 hours online, 30.43 percent indicated they spent 2-3 hours online, and 26.09 percent indicated they spent over three hours online each week.

Characteristics of the Population and Sample for the Blackboard and Twitter Participants

The majority of the participants completing the survey were 21 percent male and 78 percent female. At the university, the most recent data reflects 58 percent of students are female, and 42 percent of students are male. There were significantly more female students participating in the survey than male students. The group was comprised of 18.70 percent freshman compared to 26.65 at the university level. Group participants were comprised of 32.95 percent sophomores as compared to 16.92 percent sophomores. 19.13 percent of the participants were juniors closely reflecting the number of juniors at the university level at 19.89 percent. Study participants included 29.17 percent seniors, a comparable amount to the 24.84 percent seniors enrolled at the university.

Participants in the Blackboard and Twitter group included students from a wide span of age groups. Percent of the students ages 17-22 made up 48.08 percent. 16.02 percent of the students were ages 23-30. 25.04 percent of the students were ages 31-45. Percentage of the students ages 46 years of age or older was 4.35 percent. This data compared to university age data indicating the largest number of students enrolled were ages 20 to 21. University data also indicates the smallest amount of students enrolled are ages 50 or older.

Students who reported taking online classes before were 81.48 percent of the participants as opposed to the 12.52 percent who reported they had not taken online classes before. Students reporting spending 0-1 hours logged on to the course comprised 4.1 percent of the participants, those reporting spending 1-2 hours online were 25.57 percent of the participants, those reporting spending 2-3 hours online were 49.22 percent of the participants, and those reporting spending over three hours online per week were 24.05 percent of the participants. The majority of the students reported spending 2 to 3 hours logged on to the course per week.

Treatment Fidelity

The data were collected through self-administered, online surveys. Survey participation was voluntary and anonymous. The process for participation entailed responding to survey questions at the middle of the academic semester. The researcher did not have control over assigning students to the Blackboard and Twitter or Twitter group, nor did the researcher have direct contact with participants taking the survey. The group the students participated in was dependent on the course instructor's decision to partake in the study. Both groups of instructors participating used a course management system, Blackboard as part of their online curriculum. The Blackboard only group did not use Twitter in their courses, whereas the Twitter group used Blackboard and Twitter in their courses. The instructors using Twitter created an account and

informed students they would use Twitter for an assignments during the beginning of the semester. Students were encouraged to ask questions, engage with other students and the instructor, and tweet information pertaining to the course content. Students were asked to create an account if they did not already have one. The Twitter account information was posted on Blackboard. Students shared their tweets with the instructor by placing an @ symbol along with their instructor's Twitter name within their tweet. Twitter was not used in classes who only used Blackboard as part of their instructional delivery.

During the middle of the Spring 2014 semester, instructors posted information to Blackboard and invited their students to participate in the surveys. A hyperlink was provided for students to have direct access to the questionnaire. The survey invitation also included information indicating the survey was voluntary and anonymous. The invitation, survey hyperlink, agreement to participate, and consent form were all provided to the instructors by the researcher. The survey was administered during the seventh week of the semester.

Descriptive Statistics for Blackboard Group

Students in the Blackboard group self-reported how this tool increased their perceived academic achievement in the course through their responses to survey questions. Students responded to 8 questions pertaining specifically to Blackboard. There were 4 scales with the lowest number of 1 indicating least favorable toward the question. The mean score of 24.64 indicates students were overall less favorable toward the use of Blackboard. Standard Deviation data indicates the response numbers were widely dispersed.

Table 6

Descriptive Statistics

Source	Number	Range	Mean	Standard Deviation
Blackboard	139	8 to 32	24.64	4.48

Inferential Statistics for Blackboard Group

Students in the Blackboard group self-reported how this tool increased their perceived academic achievement in the course through their responses to survey questions. The data were analyzed using *t* tests, one way ANOVA tests, and Tukey's HSD. Mean results for each item had a possible range of 1-4 with Strongly Disagree (1), Somewhat Disagree (2), Somewhat Agree (3), and Strongly Agree (4). The mean score range was 8 to 32. Means for items written as a negative response were reversed before calculation of results occurred.

With the control group the majority of students had taken an online class before ($M = 24.21$, $SD = 4.53$) as opposed to those who had not taken an online class before ($M = 27.40$, $SD=2.98$), $t(73)$, $p < .05$. Students who had not taken an online class before were more favorable to using Blackboard than those who had not taken an online class before.

All other *t* tests on survey questions pertaining to Blackboard only responses yielded no statistical significance. Questions pertaining to Blackboard had a mean score range of 8 to 32 with a middle of the range mean at 20. Mean scores on the question relating to respondent gender were 23.64 for females and 24.93 for males with a standard deviation of 4.22 for males and 4.54 for females respectively. This data indicates there is no statistical difference between male and female perspectives on the impact of Blackboard.

Mean scores on the question relating to using Twitter before resulted in a mean of 24.67 with a standard deviation of 4.16. Mean Scores on the question relating to whether the instructor required respondents to use Twitter in this course were 23.96 for yes responses and 25.14 for no responses. The standard deviation for yes responses was 4.23 and no responses was 4.64. The test shows there is no statistical significance.

One-way ANOVAs were used to find statistical significance. The student's year in college was significant in the Blackboard group. A post hoc test using Tukey's HSD found the difference in mean highlighted data indicating a significant difference between freshman and seniors enrolled in the courses. Freshmen were more favorable toward Blackboard usage. Freshman may find more favor toward using Blackboard as an instructional tool since they have less experience using the tool. Freshman may also be more favorable toward using Blackboard and taking online courses as they have not experienced a possible difference in academic achievement between online courses verses face- to- face courses. Students taking the survey during the seventh week of the semester had not yet received mid-quarter grades to indicate how well they were performing in the course.

Table 7

Analysis of Variance for Blackboard and Year in College

	df	SS	MS	F
Between Groups	3	179.67	59.89	3.67
Within Groups	70	1143.68	16.34	
Total	73	1323.35		

*p < .05

Descriptive Statistics for the Twitter Group

Students in the Twitter group self-reported how this tool increased their perceived academic achievement in the course through their responses to survey questions. Students responded to eight questions pertaining specifically to Twitter use. There were 4 scales with the lowest number of 1 indicating least favorable toward the question. The mean score of 19.89 indicates students were more favorable toward using Twitter than using Blackboard. However, Standard Deviation data indicates overall opinions were widespread and very dispersed. The Twitter results are reported below.

Table 8

Descriptive Statistics

Source	Number	Range	Mean	Standard Deviation
Twitter	64	9 to 36	19.89	6.73

Inferential Statistics for the Twitter Group

Students in the Twitter group self-reported how this tool increased their perceived academic achievement in the course through their responses to survey questions. The data were analyzed using *t* tests and ANOVAs. The Twitter results are reported below.

In courses using Twitter the majority of students were female (M = 18.80, SD =7 .02), $t(36)=1.82$, $p < .05$ as opposed to males (M = 23.20, SD = 4.41). Males were significantly more favorable toward using Twitter in online courses. This data could be attributed to male communication tendencies or familiarity with this form of social media. Most of the students in this group had taken online classes before. More students reported taking online classes before

(M =18.96, SD = 6.3) than those not taking online classes before (M = 25.57, SD = 2.5), t (36) = -2.09, $p < .05$. Students taking online courses benefit from the convenience of the course schedule. Those students who had not taken an online class before were more favorable toward using Twitter in class. This data indicates students not taking courses online before may have not formed perceptions of what online learning should encompass.

A one way ANOVA test was used to determine the significance of age groups and their impact on Twitter usage. When examining students in the Twitter group and their ages the researcher discovered by removing one student from the age 46 and over category significance could be found between students ages 17-22 and students ages 23-30. Students in the 17-22 age group were the most favorable toward using Twitter in an online class. This data would align with traditional student ages 17-22 tendencies to utilize social media on a regular occurrence. Students using Twitter spent significantly more time logged on to the online course than those using Blackboard. Students using Twitter in an instructional setting may feel a higher amount of social presence and engagement with their peers and instructor than those solely capitalizing on the features used on Blackboard. Twitter may also provide quick, convenient access to the tool through the use of smartphones allowing opportunities to engage in both formal and informal capacities. Additionally, data may support learners embracing components of the Connectivism Theory allowing them to engage in experiences supporting learner mastery allowing for opportunities to easily jump across formal, informal, unexpected, and intentional opportunities for learning needs to be provided (Conner, 2004).

Table 9

Analysis of Variance for Twitter and Age

	df	SS	MS	F
Between Groups	2	383.23	191.61	5.22
Within Groups	34	1248.34	36.72	
Total	36	1631.57		

*p<.05

Table 10

Analysis of Variance for Twitter and Hours Logged in to Course

	df	SS	MS	F
Between Groups	3	284.37	94.79	2.32
Within Groups	33	1347.20	40.82	
Total	36	1631.57		

*p<.05

Conclusion

The researcher created survey was used to test for a relationship between the use of Twitter in online classes and student perception of academic achievement. Twitter was used in addition to Blackboard with three of the participating classes. Blackboard was only used in the remaining three participating classes.

The research question asked if the implementation of Twitter improves student perception of academic achievement? The survey data suggested some items of significance in the relationship between the use of Twitter and student perceptions of academic achievement.

Students using Twitter in online classes did not find it significantly affected their academic performance any more than only using Blackboard in their online classes. Additional findings include the following: Students who had not taken online classes before were more favorable toward the use of Blackboard and Twitter in their online classes. Male students were

more favorable than females toward the use of Twitter in their online classes. Of the students using Blackboard only in their course, freshmen were more favorable than sophomores, juniors, and seniors. When examining the age groups of students in the Blackboard only group results indicated students in the 17-22 age group and the 23-30 age group were most favorable toward using Blackboard. Students using Twitter in the online course spent more time logged on to their course.

Summary

Chapter four summarized the findings and results for the quantitative study examining the impact of using Blackboard and Twitter in the online learning environment. Students enrolled in online, general education courses participated in the study. Half of the participants used only Blackboard as part of their course while the other half used Twitter and Blackboard. Data was collected during the first half of an academic semester. Overall data indicated students without previous experience with online learning platforms were more favorable toward using those tools as a part of the instructional process. Twitter participants indicated spending more time logged on to their online course. Males using Twitter as part of their course were more favorable than females. All items of significance for the Blackboard and Twitter groups are reported below.

Table 11

Blackboard and Twitter Items of Significance

Blackboard	Twitter
Students who had not taken online classes before were more favorable toward using Blackboard.	Students who had not taken an online class before were more favorable toward using Twitter.
Students who were freshman were significantly more favorable toward using Blackboard than those who were seniors.	Male students were more favorable toward using Twitter than female students.
Students ages 17-22 were most favorable to using Blackboard.	Students using Twitter spent more time logged on to their online course.
Freshmen were more favorable toward using Blackboard.	Students ages 17-22 were more favorable toward using Twitter

Chapter four summarized the steps of the research process up to the stage of data collection, descriptive statistics, findings and results along with additional analysis of the data. Chapter five encompasses the summary, findings, recommendations, and implications of the study.

Chapter V

Conclusions and Recommendations

This study was designed to examine the effects of using Twitter and Blackboard in online courses. Specifically, the researcher desired to see how the use of Twitter in online courses impacted student perceptions of academic achievement. The study examined the difference in student perceptions of learning in the two groups studied. The convenience sample for this study consisted of students from a Missouri university who took online courses during the Spring 2014 semester and who completed an anonymous and voluntary online survey at the middle of the academic semester. The Twitter groups included 64 students and the Blackboard and Twitter group contained 139 students. The researcher hypothesized by using Twitter in the classroom student perceptions of academic achievement would improve.

The students responded to their respective surveys during the seventh week of the semester. The questions of the two surveys were written by the researcher and underwent extensive statistical testing including expert reviews, piloting the survey and conducting an exploratory factor analysis, administering the surveys and conducting confirmatory factor analyses and analyzing survey data. The research study was conducted to examine ways online delivery systems can enhance and modify the way instructors teach and students learn.

Interpretations of Findings

The research study was conducted to explore how the online delivery of content can be modified to enhance student learning. Students desire interaction in online courses structured similar to what they receive in face to face courses. The theories of Constructivism and Connectivism reiterate the desire of learners to construct their own knowledge in collaborative and reflective environments. Online learning platforms can offer opportunities for students to

collaborate and construct their own meaning of the content. According to Bonaiunti (2006) this does not mean that prior online educational environments have to be rebuilt, but the cognitive context where learning occurs must be allowed to reshape the learning environment. The shift required to accomplish this change must be personalized according to the needs and competences of the learner. Web 2.0 tools like Twitter have the potential to expand upon what can be provided by Blackboard. Students can engage with other students or the instructor in real time through mobile devices while connecting to other experts in their content areas.

In order to answer the research question, the researcher performed independent *t* tests, one way ANOVA tests, and Tukey HSD in order to examine the means of the Twitter and Blackboard groups. Students who had not taken online classes before were more favorable toward using Blackboard indicating they did not have preconceived notions about what to expect with online learning. They are open to learning platforms embraced by the instructor. Similarly, students who are new to the university setting as freshman are more formidable and willing to use tools prescribed by the course instructor. Traditional college age students were most favorable toward using Blackboard. All significant data related to Blackboard indicates students who are new to the college experience or online learning experience who are traditional college students see using Blackboard in their online courses having a positive effect on their academic achievement.

Students who had not taken an online class before were more favorable toward using Twitter. This data aligns with the Blackboard data indicating the importance of utilizing online learning platforms to enhance learning and achievement. In addition, males were more favorable toward using Twitter in an online class. This data provides an interesting perspective of male communication tendencies and a preference to communicate in a succinct manner.

The Conclusions drawn from this research emphasize the perspectives of other researchers. According to Fox and Varadarajan (2011), research on Twitter and its Web 2.0 constituents is in the infancy stages. Researchers are beginning to grasp the importance of incorporating Twitter into teaching and learning. This study encourages educators to continue examining best practices and how tools in the Web 2.0 category best fit in the instructional process. According to Breeding (2007), an environment using tools within the Web 2.0 realm focus on the user, embrace static content, seek contributing content from other users, and provide opportunities for engagement, participation, and collaboration. Blackboard and Twitter have the potential to foster learning conditions conducive to engagement, participation and collaboration and therefore positively impact the online environment. Continued research will provide more details of how to better meet the learning needs of online learners. According to Huang and Behara (2007), instructors must modify practice and acknowledge the following: they personally are no longer keepers of knowledge with the role of transferring knowledge to students; they, as instructors must shift their role to facilitator. Teachers must broaden course preparation beyond refining a lecture; instructors must identify relevant and useful web content, moderate the student interactions, and interpret the knowledge acquired by students. Instructors must continue to shift their role to facilitator and explore ways to embrace strategies promoting interaction and collaboration within the online environment.

Recommendations

Higher education stakeholders need to continue to evaluate and refine the delivery of online content. The researcher has some specific recommendations to those who design and instruct online courses based on the results of the study. It is important instructors and course designers continue to develop tools and opportunities that foster open dialogue on course content

through a platform allowing synchronous communication. Instructors can incorporate the use of Twitter in addition to the use of Blackboard as a means to connect with relevant, supplemental course materials. The use of a Twitter app on a smartphone allows students and instructors to constantly be connected.

The data suggested students who had not taken online classes before were more favorable toward Twitter. This information could be used by universities to encourage the use of Twitter not only in online classes, but also in face-to-face classes as well. Additionally, students who had not taken an online class before were more favorable toward using Blackboard. This data suggests the desire of students to have tools in their online classes that mirror the types of tools within their face-to-face classes.

Additional findings from this study show younger students are more interested in using Blackboard and Twitter in their online course. Freshmen were more favorable toward using Blackboard and students in the age group (17-22) were most favorable toward using Twitter. This information indicates traditional age college students desire learning opportunities reflective of twenty first century learning principles. This data is reflective of the need to refine instructional strategies to better meet the learning interests of our students.

Further Research Recommendations

If the researcher could perform this study again the students using Twitter would have done so for the entire semester. In addition, the researcher would have provided the instructors participating in the study with additional professional learning on Twitter and its possibilities for the online classroom.

The researcher would have examined the instructor and student engagement levels during the use of Twitter in comparison to the instructor and student engagement levels during

the use of Blackboard. This would have been interesting since this research indicates students using Twitter spend more time logged on to their classes. Since this research suggests males are more favorable than females toward using Twitter it may be valuable to examine Web 2.0 tools that do not have communication limitations. Other web platforms may provide ways for students to engage in communication not limited to 140 characters.

It is also recommended universities revisit the student communication avenues. Knowing students are willing to use tools like Twitter as freshman might encourage universities to examine their communication tools and begin to use more social media tools including Twitter. Twitter presents opportunities to reframe communication among students and their peers and students and their instructors through settings both curricular and non-curricular (Reinhardt et al. 2009).

Conclusion

The purpose of this study was to examine the impact of Twitter on student perceptions of academic achievement in online classrooms at the university level. The results from this study add to the existing body of literature in regard to the need for continued research in the area of implementing tools that allow for increased digital communication and collaboration with classmates and the instructor. The study's results encourage additional research into the Connectivism theory and its use in online course design.

The results of this research were limited in number with a small number of participants making it unable to be generalized to the larger population of online learners. In addition, the limited amount of time Twitter was used during the first half of the semester may have negatively impacted student perceptions of how the tool could effectively improve academic achievement.

The researcher believes it is imperative to continue evaluating instructional processes in the online environment. Educators continue seeking out ways to improve classroom instruction in order to maximize learning opportunities. To meet changing learner needs, the instructor must recognize the need to shift from sole custodian of knowledge to a role embracing the relationship between the instructor and leaner and recognizes the necessity to jointly construct content (Enonbun, 2010). Social media tools have the potential to be the change needed in the online learning environment when implemented in a structured and meaningful way. Dunlap and Lowenthal (2009) recommend following several guidelines for successful implementation of Twitter in an academic setting. (1) Establish relevance for students; develop a clear personal, academic, and professional purpose for using the tool. (2) Define clear expectations for participation. (3) Design tangible, measurable assignments. (4) Model effective use of the tool. (5) Actively participate as the instructor. (6) Build Twitter collected data into assessments. (7) Encourage and reward students for embedded information gleaned from Twitter into course projects. (8) Continue to actively participate in Twitter at the conclusion of the course in order to assist students as an academic consult available for advising, coaching, and mentoring. Continued research will allow educators the opportunities to refine instructional practices and allow learners to actively participate, design, and reflect upon their own learning through the use of social media platforms like Twitter.

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Appendix A: INSTRUCTOR AGREEMENT TO PARTICIPATE LETTER

Date

Name of Instructor
MSSU
3950 E. Newman Road
Joplin, MO 64801

Dear Instructor/Professor,

I am an assistant professor in the Department of Teacher Education at Missouri Southern State University. I am also a doctoral candidate studying at Southwest Baptist University in Bolivar, Missouri. I am conducting research on the impact of Twitter in the online learning environment. I am surveying students enrolled in online courses and examining mid-quarter data to determine if the use of Twitter in online, classroom instruction improves student achievement.

I am contacting you because you are teaching a pure online course this semester (Spring 2014). I need your cooperation with a study that will be conducted on our campus. The study has been approved through the President's office.

The scope of the study entails using Twitter, a microblogging and social networking platform, to encourage ongoing, public dialogue as a tool to stimulate social presence and promote academic learning. The goal of the study is not to replace the course management system (Blackboard) but to create a casual environment for faculty and students to interact. If you choose to participate, I will assist by providing multiple resources to help you and your students create a Twitter account.

If your class is selected to be a part of my control group (only using Blackboard), I would only need your assistance in posting an announcement on Blackboard asking students to volunteer to answer one online survey halfway through the semester.

Please respond to this email by (two weeks from the date sent) to provide your consent to assist with this study. Your input is essential to aiding in the improvement of online instruction.

Please contact me if you need additional clarification or would like to discuss your participation.

Respectfully,
Cherona Hicklin
Hicklin-c@mssu.edu

Appendix B: FACULTY EMAIL

Dear MSSU Faculty Member,

Thank you for agreeing to participate in my study. As we near the middle of the semester, please email and post the attached invitation on Blackboard for your students to participate in the survey.

The following is a link to the survey: (survey link here)

If you need further information about this study, please don't hesitate to contact me.

Thank you again for your willingness to participate!
Cherona Hicklin

Appendix C: FACULTY EMAIL

Dear MSSU Faculty Member,

Thank you for participating in the research and posting the survey.

Please let me know how many students registered for your course at the beginning of the semester and how many remain active at this point in time.

Thank you again for your commitment to improve online learning.
Cherona Hicklin

Appendix D: STUDENT SURVEY COVER LETTER AND AGREEMENT TO PARTICIPATE

Date

Dear Student:

I am a doctoral candidate studying at Southwest Baptist University in Bolivar, Missouri. I am inviting you to participate in a study since you are enrolled in an online, general education course. The study seeks to determine if the use of Twitter in online courses helps to improve academic achievement.

Online courses offer many benefits to students. It is of great value to educators that we understand what instructional practices have the greatest impact on student learning. This study seeks to determine the value of adding tools like Twitter to promote social interaction and connect students with content beyond what is provided in the course materials. Twitter can be used to ask course related questions, chat about homework, collect and share resources and collaborate with study groups.

I am asking for your approval to participate in the study. You will be asked to take a survey right before mid-quarter. Survey results will be anonymous and no identifying information will be included in the results. Please review the Consent Form for an overview of your rights as a participant in this study. The survey will be administered via email and should take no longer than 10 minutes to complete and return. Please complete the survey and return it by (two weeks from the date sent). If you choose to participate, you are still free to not answer any questions you do not want to answer on the survey.

Thank you for your consideration.

Sincerely,

Cherona Hicklin
Doctoral Candidate

Appendix E: CONSENT FORM

Thank you for agreeing to take part in a study examining the effect of Twitter usage on student perceptions of academic achievement in online classes at the university. You were selected for this study because you are currently taking an online class. Thank you for your willingness to participate in this anonymous survey.

This form is part of a process called informed consent which allows you to understand this study before deciding whether to take part.

Background information: The purpose of the study is to examine the effect of Twitter on student perceptions of achievement in an online class environment.

Procedures: If you agree to be in this study, you will be asked to complete the questionnaire within the week prior to mid-quarter of the Spring 2014 semester. An announcement and link to the questionnaire will be posted on Blackboard by your instructor.

Voluntary Nature of the Study: Your participation in this research project is completely voluntary and anonymous. Your decision not to participate in this project will not result in any penalty and will not affect your class grade.

If you choose to participate, you are free to withdraw at any time without consequence by closing the browser window on your computer. Additionally, you may skip any questions in the questionnaire that you do not want to answer.

Risks and Benefits of Being in the Study: There are no risks associated with participating in this study. The benefit is that by participating you are assisting instructors with knowing what kind of tools can improve the instructional design of online classes.

Confidentiality: Your responses will be used for study purposes only. Individual responses will not be tracked.

Any information you provide will be kept confidential. This study is anonymous; no names or e-mails are collected.

Contacts and Questions: If you want to talk privately about your rights as a participant, you may contact dissertation advisor, Dr. James Truelove at jtruelove@sbuniv.edu

If you have any questions at any time during the course of this study you may contact the researcher via email at Hicklin-c@mssu.edu or by phone at 417-625-3153.

Appendix F: STUDENT SURVEY

The Impact of Twitter on Student Perceptions of Achievement in Online Learning Environments

Purpose of This Survey: Online learning offers many advantages to you as a Missouri Southern student. As professors, we are constantly assessing the instruction that takes place in this setting. The following survey will provide us insight concerning the online learner's knowledge base pertaining to how Twitter can impact learning in this course. The results of this survey will assist academics in implementing practices with the potential to positively impact student achievement in the online classroom setting.

Please mark the appropriate box next to your answer choice with an "x" (X). Please answer all of the questions to the best of your ability.

Student Demographic Information *(Check the appropriate box)*

1. ___male ___female

2. ___freshman ___sophomore ___junior ___senior ___other

3. ___ 17-22 years ___ 23-30 years ___ 31-45 years ____ 46+ years

4. I have taken an online class before ____ yes ____ no

5. I have used Twitter before ____yes ____no

6. On average I spent ___ 0-1 hours ___ 1-2 hours ___ 2 -3 hours ___ 3 plus hours a week logged in to this course.

7. The instructor required us to use Twitter in this class ____yes ____no

Please mark the appropriate box next to your answer choice with an "x" (X). Please answer all of the questions to the best of your ability.

Questions Pertaining to Blackboard Questions 8-16 attempt to measure the impact of Blackboard discussions on student perceptions of achievement.	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
8. The Blackboard discussions contributed to my knowledge in this course				
9. Using Blackboard discussions helped me communicate better with other classmates in this course				
10. Using Blackboard discussions helped me communicate better with the faculty member in this course				
11. I learned from others replies to my Blackboard discussion posts				
12. I learned from my replies to others Blackboard discussion posts				
13. The immediacy of response time from other students positively impacted my learning of the content				

14. The immediacy of response time from the instructor positively impacted my learning of the content				
15. Interactions with other students on Blackboard helped make my success in this course similar to a face to face course				
16. Interactions with the instructor on Blackboard helped make my success in this course similar to a face to face course Students taking a course using Twitter answer questions 17-25. If your course did not use Twitter as an instructional tool your survey is now complete. Thank you for your participation. Questions pertaining to Twitter Questions 17-25 attempt to measure the impact of Twitter on student perceptions of achievement				

17. The tweets I made contributed to my knowledge in this course				
18. Using Twitter helped me communicate better with other classmates in this course				
19. Using Twitter helped me communicate better with the faculty member in this course				
20. I learned from my replies to others tweets				
21. I learned from replies to my tweets				
22. The immediacy of response time from other students positively impacted my learning of the content				
23. The immediacy of response time from the instructor positively impacted my learning of the content				
24. Interactions with other students on Twitter helped make my success in this course similar to a face to face course				
25. Interactions with the instructor on Twitter helped make my success in this course similar to a face to face course				

Thank you for participating in this survey. Your input is greatly valued.