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THE INFLUENCE OF A LEARNING MANAGEMENT SYSTEM (LMS) AND MICROBLOGGING ON SOCIAL PRESENCE, SENSE OF COMMUNITY, AND USER INTERFACE SATISFACTION IN A DISTANCE EDUCATION COURSE

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by

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DISSERTATION

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DEDICATION

I would like to dedicate this dissertation to my mother, family, friends and future self. My mother always encouraged me to work through all obstacles. She was confident in my abilities even when I was not. She says that she was always proud of me. My family for telling me how amazing it was that there was a doctor in the family. Friends who were surprised by my academic achievements, jealous of my willingness to pursue my passions, and proud of my strength. Finally, my future self, to you I say that you have committed to and achieved your dream. Your heavenly father has always provided and blessed this pursuit. Please remember that you are not alone in this journey. So when you feel guilty that you have summers off, remember that you have earned this.

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The Influence of Learning Management System (LMS) and Microblogging on Social Presence, Sense of Community, and User Interface Satisfaction in a Distance Education Course

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ABSTRACT

Social media has transcended its initial purpose of connectivity and branched into other sociocultural aspects. Educators must create a rich and active learning environment where students can actively engage with their educational curriculum. This study used a mixed methods approach to investigate the influence that learning management systems (LMS) and microblogging (social media) have on key elements of distance education design. These elements include social presence, sense of community, and overall user interface design. Students' perceptions of these elements were collected from students enrolled in a graduate course during summer and fall 2020 by completing an adapted survey instrument built from previous scholarship. Data was analyzed quantitatively using non-parametric statistical testing. Qualitatively, instructors of record were asked a

series of semi-structured interview questions that were analyzed using In Vivo, Values, and Pattern coding.

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CHAPTER 1

INTRODUCTION TO THE RESEARCH STUDY

The impact of 21st century technology on society is undeniable. From social media to mobile technology and distance learning environments, our world is defined by the affordances of technology. The utility of mobile technology allows people to transcend geographical borders and interact with a global community without the constraints associated with time and space. While the impact of those innovations on business, communication, and sociology has been well documented (Aral, Dellarocas, & Godes, 2013; Baym, Zhang, & Lin, 2004), the connection between millennia technology and higher education continues to grow and develop. Many communication scholars (Al-Harrasi & Al-Badi, 2014; Mastrodicasa & Metellus, 2013) argued that social media has had a positive impact on college students' cognitive development, learning, social skills, and self-awareness.

According to Bates and Poole (2003), to become better educators, it is imperative for institutions of higher learning to explore this intimate relationship between technology and today's higher education student body. For far too long, college and university educators have seen some modern technologies, cell phones, and other mobile devices, as distractions to the conventional learning process. It was the intention of this research study to dispel the notion that these essential technologies are a distraction and

instead to compel the education community to recognize the positive impact and educational value of incorporating social media (Twitter) into distance education courses.

Allen and Seaman (2014) of The Babson Survey Research (BSR) is one of the most prominent organizations that document trends in online learning in U.S. higher education. One particularly interesting finding of this report was that over 25 % of college students will take at least one distance education course before they graduate. This percentage equates to a total of 5.8 million students participating in distance education with 2.85 million of them taking all of their courses online. A more recent report was released in 2018 by BSR. It substantiated the findings presented in 2015. BSR reported that distance education enrollments increased for the 14th straight year (2004 to 2018) and that 2018 saw a 5.6% increase over the previous three years. Additionally, BSR reported that the percentage of students who took both distance and face-to-face courses was roughly the same as those who took distance education courses exclusively.

It is not just students who see the positive impact of distance education. Administrators in higher education institutions have realized the growing interest in today's students to learn online. This figures how not gone unnoticed by university leadership and administration. BSR's 2015 report stated that many of these decision makers view distance education as a critical component to the curriculum offerings. Moreover, over 70 % of these individuals reported that learning outcomes where similar if not superior to those expressed in face-to-face formats. findings are best summarized by statements made by Julia E. Seaman, Research Director of the Babson Survey Research Group, in the BSRG's 2018 report. "The growth of distance enrollments has

been relentless. They have gone up when the economy was expanding, when the economy was shrinking, when overall enrollments were growing, and now when overall enrollments are shrinking."

Background of the Problem

Overall enrollment in higher education is decreasing while the overall percentage of student enrollment in online courses has continued to grow. That increase in students' interest for distance education is well documented (Beaudoin, 2016; Eom, Wen, & Ashill, 2006). This increased enrollment in online education is due to many factors. Most recently, the COVID-19 global pandemic has necessitated the transition away from face-to-face interaction to a distance education model. COVID-19 amplified the need for higher education to serve student bodies with more remote means of content delivery. Toquero (2020) states that the COVID-19 pandemic presents a present need and opportunity for continued exploration in the ways in which education can be transmitted via the internet. Toquero (2020) research encourages educators to adaptive to the learning students that transcends the limitations of synchronous delivery methods. Toquero (2020) suggests that university take note of the pedagogical ramifications thrust upon higher education due to the inability to present and deliver content face to face and in real-time.

Educators from all disciplines, ranging from preschool to doctoral programs, have been forced to utilize some form of distance education delivery as they transition away from traditional face-to-face formats. The first stage of transition was marked by technical difficulties, internet availability, and challenges in content delivery. The next

stage of this process will be based on how well the delivery was executed from an end-user perspective. It will not be enough to deliver the educational content because success will be determined by the participants' perceptions of participation and engagement with content material. Marinoni, Van't Land and Jensen (2020) describe these changes and modifications in their work with the IAU (International Association of Universities) Global Survey – *The Impact of Covid-19 on Higher Education Around the World*. Marinoni et al. (2020) report Covid-19 may create a reevaluation of the need for students to take face to face courses (given the overall quality and experience of learning remotely), community partnership has decreased due to lack of connectivity and discussing changes to standardize, in person testing.

Another reason for the increase in online enrollment is that students report that online courses offer more flexibility and accessibility than their face-to-face counterparts (Smart & Cappel, 2006; Young & Norgard, 2006). Nearly 80% of college students have part-time employment while they attend college (Fang, 2013). Those online courses allow students to work the hours they need to attend college. Additionally, distance education courses minimize transportation costs, face-to-face requirements, and additional required resources typically associated with face-to-face courses.

Statement of the Problem

The essence of this research is comparing several elements of what is considered effective distance education curricula. These elements include social presence, sense of community and overall design (Jones & Schleman, 1995; Kupczynski, Mundy, Goswami

& Meling; 2012; Zheng & Smaldino; 2009). These elements have been explored in numerous contexts; different subject matters/disciplines (Mayne & Wu; 2011), various learning management systems (Rideout, Bruinsma, Hull & Modayil; 2008), and with particular teaching techniques (Johnson, Cowie, DeLange, Falloon, Hight & Khoo, 2011). However, there exists a gap in the literature associated with comparing communication affordances between traditional learning management systems (LMS/microblogging) with social media applications (Twitter).

Despite the growth of distance education courses, recent higher education scholarship reports the superiority of face-to-face courses. These advantages include real-time dialogue, dynamic social interactions, instantaneous content development, and small-group collaboration (Jaggars, 2014; Bali & Liu, 2018). Those factors demonstrate the need for distance education institutions and instructors who create interactive, engaging, and effective instructional design models. Scholars have investigated the aspects of distance learning courses that are more effective in increasing the level of students' participation, satisfaction, and overall engagement. Concepts such as social presence and building a sense of community are two of the success factors scholars cite when discussing an effective online curriculum. Social presence (Tu & McIsaac, 2002) and sense of community (Rovai, 2002) are important concepts to consider because they demonstrate a participant's willingness to replicate some aspects of face-to-face interactions. For example, displaying social presence could be describing one's personal hobbies and interests. While building a sense of community could be demonstrated by

engaging in a discussion forum where one could express their personal experiences with a sociocultural phenomenon.

Components such as instant messaging, weekly announcements, multimedia inclusion, and discussion forums have been studied to determine the activities that contribute to a student's social presence and that create a sense of community. However, the potential impact, both positive and negative, of the medium of transmission is an area into which little research has been conducted. Smyth (2005) was one of the first scholar to discuss the impact of broadband videoconferencing in the context of teaching. Smyth (2005) states that "digital network transmission increase(s) the richness of video conferencing to a much closer approximation of natural communication" p. 805). This early finding (2005) presents a framework for this research to continue to see the impact (positive or negative) of the technology on educational communication.

Each of the activities mentioned above are presented within a framework or software program such as LMS, Moodle, or Canvas. The challenges associated with increasing a student's social presence and creating a sense of community persist today. Social presence, sense of community, and user interface design have been explored using traditional LMS. However, investigating the impact of social media on social presence and sense of community is a relatively new discipline, dating to the late 2000s. Some of the early scholarship includes Tu and McIsaac (2002); Walker (2007); and Sung and Mayer (2012).

Another key construct of this study is the relationship between user interface design and satisfaction in a distance education course. How an individual interacts with the technology (features, graphical representations, procedural design) can be a factor in an individual's sense of satisfaction. Shneiderman, Plaisant, Cohen, Jacobs, Elmqvist and Diakopoulos (2016) study describes the influence (positive or negative) of modern user interface design. These scholars open the discussion for further investigation on how certain design elements and new technologies, such as social media, impact the overall experience of a user in those environments. The gaps in the literature that this study was intended to fill compared a traditional LMS to a social media platform (Twitter) regarding those key constructs. This comparison model is intended to serve the educational community as it decides which medium best suits its needs in relation to creating social presence and sense of community.

Purpose of the Study

The scholarship surrounding social presence, sense of community, and user interface design has encouraged scholars to explore what elements make for an effective distance learning curriculum. Early research, Tu & McIsaac, (2002); Aragon, (2003), in this field suggests that students prefer online courses that have an interpersonal component, giving them a feeling or perception that their instructors and classmates are "real" people. Two of the characteristics that define these real people are that they communicate in an open and relatable manner and that they demonstrate a willingness to share a personal or professional aspect of their lives. Those attributes contribute to the overall connectivity of participants to one another. This feeling or perception has been

defined as social presence. Early research also suggests that clarity of design and developing active discussion among course participants contribute to an effective online course (Gunawardena, Carabajal, & Lowe, 2001; Swan, 2001; Bolliger, 2004). These findings provide a foundational understanding of how to measure key constructs, such as social presence and sense of community.

User interface is another aspect of this study that will be explore as it relates to the connection between the aforementioned effectiveness and satisfaction. Some of the elements of this user interface design that this study explores is the ease of navigation, clarity of graphical illustrations and ability to accomplish communicative goals through the media itself. The purpose of this study was to deepen the understanding of distance learning by investigating how social media, in this case, Twitter, impacts social presence, sense of community, and user interface design. The objective of this project was to explore the influence of an LMS and social media (Twitter) on key components of distance education courses, social presence, sense of community, and user interface satisfaction.

Research Hypothesis and Questions

My hypothesis: Microblogging is a more effective medium than LMS in creating social presence and a sense of community and possesses a better overall user-interface design for distance education courses.

Research questions:

- Is there a difference in social presence between LMS and microblogging in a distance education course?
- Is there a difference in sense of community between LMS and microblogging in a distance education course?
- Are there any differences in students' perception of user-interface design, functionality, usefulness, and ease of use between LMS and microblogging in a distance education course?

Qualitative Research Question and Sub-questions

RQ1: How do LMS and microblogging influence students' participation in an online learning environment?

SBRQ1: What aspects of LMS and microblogging influence students' participation in an online learning environment?

SBRQ2: How do instructors use LMS and microblogging as a resource to promote personal bonds (social presence) among students?

SBRQ3: How do instructors use LMS and microblogging as a resource to build a communal connection (sense of community) among students?

Significance of the Study

The purpose of this study was threefold. First, this study was intended to increase the theoretical understanding of how social presence, sense of community, and the user-interface design impact participation in a distance education course. Secondly, the study was intended to present the firsthand experiences of instructors using LMS or

microblogging to create environments conducive for student communication, interaction, and overall participation. Thirdly, this study was intended to guide instructors and institutions of higher education about which LMS best serves their online curriculum initiatives.

Distance education scholars have explored factors that contribute to student participation and engagement within online courses. Initially, education scholars perceived face-to-face instruction to be superior to that of distance education because of its potential for dynamic interaction between student and instructor. Traditional teaching methods, such as question and answer sessions, group work, role playing, and the likelihood of immediate feedback, were considered stalwarts of adult learning. However, scholars in distance education such as Ally (2004) and Liao (2007) contend that these aspects can be achieved, in one form or another, with the assistance of the medium such as a LMS, social media, and digital media. Becker (2010) expounds on the Clark-Kozma debate in regard to "media effects" paradigm. Becker (2010) offers up a revision to the Clark preposition of media is not the message to Kozma's symbolic system of meanings and understanding introduced by new media. Becker (2010) states that modern technologies, much like the characteristics of social media, contain an element of gamification that could increase a participant's level of interest and thus satisfaction.

The medium could range from TV, to computers, the internet, and social media. Recently, Gulbahar and Adanir, (2021) contributed to the discussion of media effects by connecting social media on academic learning. Gulbahar and Adanir (2021) use the Clark-Kozma debate to frame how social form a new type of environment called

collaborative-learning platforms and virtual classroom management simulation that augments the reality set forth by Clark-Kozma. Instead of standing the side of one scholar over the other, Gulbahar and Adanir (2021) seek to better the practical applications to enhanced established learning theories and pedagogical practices

The importance of the medium is underscored by the academic outcomes it produces. Three key factors emerged from distance education scholarship when considering the relationship between student participation and electronic delivery. These three factors include social presence, sense of community, and user interface design.

Social presence, sense of community, and user interface design have been shown to be some of the most influential factors associated with student participation in an online course (Mazzolini & Maddison, 2003; Morris, Finnegan, & Wu, 2005). Mazzolini and Maddison (2003) investigated the ways in which instructors attempted to influence their students' overall participation and perceptions of satisfaction in an online course. This study revealed that although more frequent posts by the instructor did not equate to more participation in a discussion forum, student rated these instructors as more enthusiastic and knowledgeable compared to the ones that did not engage as often. This study has influenced this project because of its similar data sample (older, non-traditional learners, graduate students) and its insight into how outside influencers – those that are more "vocal and verbose" in their responses – influence the overall satisfaction of others in the course.

This project is built upon previous literature that states the important role these constructs play for both students and instructors as they engage in a dynamic distance education course. Although the elements of these concepts have been explored, there was a need to determine if LMS's are effective mediums to deliver these elements. The need for this exploration was particularly evident so that institutions of higher education can determine the best means of delivery for today's distance education needs. The importance of each of these constructs is described in detail in subsequent sections. The addition of social media, in this case, microblogging, will enrich the discussion of how modern technologies can be utilized as effective delivery mediums.

Additionally, this project considered the experiences of instructors using LMS or microblogging for their distance education courses. There exists a gap in the literature that includes the perceptions and experiences of instructors when discussing the impact and utilizations of LMS in distance education courses. This project shared the experiences of two online instructors using LMS or microblogging in hopes of providing peer-to-peer guidance on how to effectively incorporate features of these two LMS's into an online curriculum. It is incumbent upon instructors to enhance their instructional design and delivery given the higher education's need to provide online courses. Practically speaking, it was the hope of this project to offer all distance education instructors a new perspective on how to use other forms of technology to increase the use of social presence, sense of community, and user-interface design.

Lastly, this project provided insight into how effective LMS, and social media (microblogging) are at creating social presence, sense of community, and the overall user

interface design. An aim of this research was to provide guidance on how to practically apply social media (Twitter) into a distance education course. The experiences of both students and instructors were offered to formulate a more comprehensive understanding of the influence social media can have on key components of distance education courses. Additionally, this research provided a mixed method approach to investigate the intriguing connection between social media and distance education curricula. Combining the statistical knowledge of quantitative methodologies with thick, rich qualitative description will further enhance the academic discussion related to the successful integration of microblogging into a distance education environment. The hope was that other distance educators would see the overall value of my study and consider making changes to their curricula. Additionally, this project presents a new perspective on the interconnectivity between social media and distance education and is a step toward addressing the present gaps in the literature.

Educational administrators review modes of content delivery for online courses as they navigate the needs and desires of college students. One of the most dynamic forms of communication and connectivity comes from social media. A vast number of college students use social media to engage with each other in personal and meaningful ways. Social media sites such as Facebook, Instagram, TikTok, and microblogging are often the chosen methods for peer-to-peer communication. Although a copious amount of academic research exists into the impact of social media on curriculum, a need exists for instructors to better understand how to effectively incorporate nontraditional online resources into the digital classroom. It was the intent of this project to explore how an

online instructor might leverage the features of social media for increased student participation in a distance education course.

Definition of Terms

Distance Education: "Institutional, formal education where the learning group is separated, and where interactive telecommunication systems are used to connect learners, resources, and instructors" (Schlosser & Simonson, 2006, p. 1).

Learning Management System (LMS): a digital software program to "process, store and disseminate educational material and support administration and communication associated with teaching and learning" (McGill & Klobas, 2009, p. 496).

Microblogging: "a communication channel for people to broadcast brief text (sometimes with photos) about what they are reading, thinking about, and experiencing in their daily lives" (Zhao & Lu, 2012, p. 825).

Social Presence: "Participants identifying with the community, communicating purposefully in a trusting environment and developing interpersonal relationships" (Garrison, Anderson. & Archer, 2010, p. 7). Garrison et al. fit my study because they consider identification, intentionality, trust, and interpersonal components. I used the work of Garrison et al. to create an adapted instrument to measure sense of community in a distance education course while using LMS or microblogging for discussion topics.

Sense of Community: Sense of community is "the degree of feeling, perception and reaction to another intellectual entity in the CMC environment" (Rovai, 2002, p.

146). Rovai's definition informed my study by providing a scale with which participants can assess their perceptions or degree of social presence. I used the work of Rovai to create an adapted instrument to measure social presence in a distance education course while using LMS or microblogging for discussion topics.

User Interface Design: User interface design is "the lens through which the instructor or designer communicates with learners" (Metros & Hedberg, 2002, p. 191).

Assumptions, Limitations, and Delimitations

Assumptions

- Participants would be willing to communicate their thoughts in writing on both LMS and microblogging.
- Participants would be willing to engaging in dialogue with one another on both LMS and microblogging.
- Participants who were unfamiliar with microblogging would be asked to learn the basic functionality.

Limitations

- Students communicate more effectively in a face-to-face course
- Students are more likely to form relational and communal bonds in a face-to-face course
- Many of OILS 514 students are part-time, graduate, nontraditional, and classified as adult learners.

- LMS users' posts would be confined to those enrolled in the summer 2020 course.
- Learning Management Systems' discussion forms are confined to those enrolled in the course
- Learning Management Systems are difficult to access without logging into the parent system (university login credentials are required)
- Microblogging (Twitter) has a 280-character limit
- Microblogging (Twitter) requires additional learning and skill acquisition
- Students using microblogging might have their posts read by the general public (those not enrolled in the course).
- Microblogging might be a potential source of distraction, given its accessibility to other subject matters.
- The findings would be limited to two classes in the same department over two semesters.
- The sample size and characteristics:
    - Convenience sample.
    - Quantitative: 15-20 students per class, per semester; participants would be classified as graduate and nontraditional students.
    - Qualitative: Two instructors of record, one per semester.
- Microblogging might encourage bad spelling and grammar due to character limits.
- Microblogging might cause additional texting and data charges depending on carrier.

- The limited number of characters per tweet associated with microblogging (280).
- The lack of comparable mobile access between microblogging and LMS.
- The inability to include attachments on microblogging as students can with LMS.
- Microblogging reserves the right to suspend accounts that promote political or cultural extremism.
- Microblogging is not permitted to be used in Iran, China, and North Korea and is intermittently blocked in Egypt, Iraq, Turkey, and Venezuela.

Delimitations

- Choosing a mixed method approach for data collection and analysis.
- Lack of inferential statistics due to small sample size.
- Participation in this study is voluntary; a substitute assignment would be created for students who opt to not participate.
- Participation is not extra credit but rather would be a portion of a student's overall discussion score.
- Microblogging users might receive comments from people not enrolled in the course.
- Qualitative data would be limited to semi structured interviews to the two instructors of record.
- Microblogging has considerably better mobile access than LMS.
- Choosing not to include other distance education characteristics due to the existence of extensive prior research.

- Students and instructors might feel an initial hesitation to use microblogging as described by Diffusion of Innovations and Technology Acceptance Model (Rogers, 2010; Davis, 1989). The Diffusion of Innovations and Technology Acceptance Model describes the process and degree of comfort learning a user experience adopting a new technology.
- Students and instructors might feel that their messages are less private given the accessibility of microblogging.
- Students and instructors might experience an increase in workload in reading material from online repository (Dropbox) and then would have to post their thoughts and reflections on a different software program such as LMS and microblogging.
- This research did not include the actual words and phrases used in peer-to-peer, peer-to-instructor, and instructor-to-peer communication exchanges.

Conceptual Framework

It was the intent of this project to compare the relative impact--in terms of social presence, sense of community, and overall user-face design--between microblogging and LMS. This illustration shows the mediating factor that LMS or microblogging has on the three key constructs. This study theorized that Twitter's unique features (tweets, direct mobile access, and wider reach) would have a greater impact on a student's social presence and sense of community. This set of features was compared with the various

components of LMS. Included in this study was the instructor's perception on how LMS or microblogging influenced students' social engagement based on these three constructs.

Summary and Organization of the Research Study

This study presented a historical context of distance education, a review of the literature concerning key constructs, scholarship, previous research, explanation of methodology, data collection and analysis, and conclusions of the research. The study used a mixed methods approach for data collection and analysis. The quantitative methods included administering a 35-item survey instrument to the students of both sections (2020 summer session and fall semester) during the last week of class. The quantitative data collected was analyzed using a variety of descriptive and inferential statistical measures. I collected and analyzed my data using survey instrumentation and various data analytics. The qualitative methods included interviewing the two instructors of record using a semi structured protocol consisting of three main questions and 10 sub questions. The qualitative data collected was analyzed using Creswell & Creswell (2017) case study methodology.

CHAPTER 2

LITERATURE REVIEW

Since early human history, meaning was made by sharing their experiences with others (Leeds-Hurwitz, 2009). Humans create knowledge, define their perceptions of existence, and define their perceptions of reality by communicating with those around them (Elder-Vass, 2012; Fairhurst & Grant, 2010). Early Greek philosophers Socrates and Plato built upon the elements of storytelling to create a new form of communication known as cooperative argumentation. That form of dialogue spawned many forms of western education ideologies, such as oral discourse and educational lecture.

Historians Ferruolo (1985) and Lulat (2005) believe that the practice of educational lecture traces its origin to early medical universities. It was here that an instructor of some renown and expertise, would read from an original source to a listening audience. This audience or group of students would then write notes based on their understanding of the reading. Such diffusion of knowledge served as the basis for how higher education institutions taught their students. Modern educational research has critiqued the overall effectiveness of this teaching method (Lloyd & Knutzen, 1969; Scerbo, Warm, Dember, & Grasha, 1992; Hendry, Armstrong, & Bromberger, 2012).

Those scholars contend that student-centered learning techniques, such as collaborative learning, small-group communication, and gamification (adding elements of competition, various rewards, and scoring systems to academic curricula) have shown to be more effective in improving comprehension, cognitive skills, and tactical understandings.

Recent educational scholarship has shown that lecturing is becoming less and less effective for the transfer of knowledge (Bartsch & Cobern, 2003; Covil, 2011). "Learners actively create knowledge and meaning through experimentation, exploration and the manipulation and testing of ideas. Interaction and feedback from others assist in determining the accuracy and application of ideas" (Palloff & Pratt, 2007, p. 16). That shift in ideology is more relevant today than in other time in educational history due to the accessibility of information and the growing desire for social connectivity. Humans, especially today's young adults enrolled in a college or university, desire to learn from one another as much as they do from their instructors. That desire manifests itself in the availability of thousands of mobile applications and social networking sites that connect liked-minded individuals to another. This connectivity can result in more meaningful relationships and thus deeper learning environments.

Curriculums based on group discussions and peer-led activities are gaining popularity because of their ability to foster deeper levels of understanding. A key element to the social construction of knowledge is the opportunity for participants to engage each other in meaningful dialogue. That aspect of communication has a connection to our Socratic past. Modern distance education scholars refer to this phenomenon in forms of social presence and sense of community. Both terms, social presence, and sense of

community, contain elements where intercommunicative relationships are valued and investigated independently. Students prefer to have their voices heard and desire to contribute to an overall curriculum. An argument could be made that modern higher education institutions have granted more agency to the learner. Additionally, the proliferation of educational resources designed specifically for increased student engagement and advancements in technology have predicated a movement away from the pure lecture format. Many universities consider a high level of peer-to-peer interaction as a tenet for effective instructional design (Webb, 1989; Shih, 2011).

Face-to-face courses have an inherent advantage over distance education courses due to the component of direct human interaction. The instructor and students can engage in dialogue in real-time without the need for a technological intermediate. However, creating environments for meaningful dialogue among students is as important in a distance education course as it is in face-to-face formats (Stein, Wanstreet, Calvin, Overtoom, & Wheaton, 2005). A primary purpose of an online discussion board is to simulate the discussions learners have in traditional face-to-face courses. Many educational research studies describe a positive connection between a student's level of participation, the corresponding construction of knowledge, and the sense of engagement (Von Glasersfeld, 1989; Bianchini, 1997). Students learn from each other in ways that are lacking in other traditional methodologies. Given the impact of students learning from each other, online instructors try to create environments that promote collaboration and dialogue. However, there is a gap in the literature that addresses how well certain mediums generate this interactive environment. It is the intention of this study to explore

the interactivity among students in discussion groups in an online course by comparing traditional LMS with the microblogging platform microblogging.

Historical Context: Distance Education and Modality

Schulte (2011) holds a prominent role in understanding the origin of distance education. Schulte (2011) reported that the discipline can be broken down into three divisions or moments in time: correspondence courses, limited media courses, and fully integrated technology courses. Schulte (2011) stated that it was English inventor Sir Isaac Pitman who started the first correspondence course via mail in the 1840s. According to Schulte (2011), the second phase of distance education occurred in the United Kingdom's Open University. This institution incorporated audio and visual material as well as radio broadcasts and television telecasts during the 1970s. Those added resources "brought distance education in from the fringes and closer to the mainstream of traditional education" (Matthews, 1999) (p. 35). Those mass media broadcasts launched the phenomenon now known as computer-mediated communication (CMC). Schulte (2011) stated that modern distance education courses often include an electronic communication medium, a central hub for interaction, and certain educational variables. Schulte (2011) reported: The creation of the World Wide Web in the 1990s and the subsequent development of software support programs such as LMS, WebCT and Locus Notes have resulted in the exponential growth of web-based instructional delivery (Lease & Brown, 2009; p. 419). These studies inform my study because it demonstrates the value of

educational technology as it relates to key constructs of effective instructional design for online education; social presence, sense of community and user -interface. This statement informed my study in several ways. First, Lease and Brown (2009) provide a date range, 1990s, when the influence of computer technology began to influence instructional delivery in higher education. Second, the introduction of LMS is mentioned as one of the major points in the timeline of software development. Third, the impact that web-based instructional delivery has had on the distance education discipline.

Schulte (2011) concluded that additional empirical research is needed to illustrate the impact that distance education has on institutions of higher learning. Moreover, Schulte (2011) recommended that more research should be devoted to exploring the evolution of distance education because of the ever-changing nature of technology. That statement demonstrates the need for research to consider the potential impact that modern technology can have on distance education. It was the intent of this study to add to the corpus of knowledge by offering a new perspective on how microblogging can contribute to the evolution of distance education. More specifically, this research project explored how microblogging influences the communicative dialogue between students in discussion forums.

Another area of debate is the influence of media on a student's level of participation and engagement within the learning process. Clark (1994) contended that the medium or mode of transmission does not influence learning or motivation. Clark (1983) drew from previous scholarship (Mielke, 1968; Schramm, 1977) to form a new conclusion that media is "mere vehicles that deliver instruction but do not influence

student achievement any more than the truck that delivers our groceries causes changes in our nutrition" (p. 445). A fundamental premise to Clark's (1994) argument is that "no single media attribute serves as a unique cognitive effect for some learning task" (p. 22). The reason for Clark's (1994) argument is that his study did not reveal a relationship between a positive or negative influence on a learner's experience based on the mode of transmission. Simply put Clark's (1994) argument is based on the notion that no one medium is necessarily better than another in terms of student achievement.

This does not mean that all media are completely ineffective in accomplishing a certain set of desired outcomes. That supposition could be invaluable in deciphering whether my research supported the claim of no effect or added to the counter argument that the media does indeed "matter" when it relates to student participation and engagement in a distance education course.

A counter argument to Clark (1994) was presented by Kozma (1994) in an attempt to "explore the conditions under which media will influence learning" (p. 7). Unlike Clark's (1994) supposition that media has no influence or relationship with learning, Kozma (1994) presented two pieces of research papers *Thinker Tools* and *The Jasper Woodbury Series*, to demonstrate there is indeed a relationship between media and learning. In both studies, the first in a K-12 environment and the second at the university level, the experimental group scored higher marks on pre-posttest criteria than that of the control group. Kozma (1994) concluded that "learning with media can be thought of as a

complementary process within which representations are constructed and procedures performed" (p. 11).

Kozma (1994) found that the computer programs afforded students the ability to initiate objects of motion and to employ elements of force as they actively manipulated Newtonian laws. Kozma (1994) supposed that this element of active engagement "quite likely made a significant contribution to the learning achieved" (p. 12). Kozma (1994) did not attempt to refute Clark's (1994) argument but rather shifted the debate away from no media effects to the distinction "between attribute as a capability of a medium and the variability of its use" (p. 13). Kozma (1994) contended that the influence of media cannot be reduced to a binary of effective or ineffective. Media theorists argue that humans process different types of media in different ways. Processing text-based or audio-linguistic information requires a different cognitive process than that of deciphering dynamic visual symbol systems. Kozma (1994) further elaborated on this point by stating that "understanding the ways in which students use the unique process capabilities of the computer is essential to understanding the influence the computer may have on learning" (p. 13-14). That statement gives credence to the need for additional research projects that further explore relationships between social presence and sense of community with new forms of educational technologies such as microblogging.

Microblogging can enable participants to communicate in more succinct, convenient, and accessible ways in relation to other forms of electronic communication platforms like LMS. These increased connectivity and novel form of communication has intrigued scholars as to the potential that it has for understanding the connection between

CMC and academic dialogue. Kozma's (1994) research provides a framework for further exploration into how the visual symbols (in this case those connected with Twitter's interface) influence the communicative patterns of its participants. Moreover, Kozma's (1994) moves beyond the binary of effective vs. ineffective into the realm of relationship and influence of communication with learning. Kozma (1994) allowed for future research into new technologies within the context of computer process capabilities and its impact on learning.

All of those statements contribute to Kozma's (1994) perspective that media can be considered casual mechanisms where elements that do in fact play a role in the learning process. Kozma (1994) report ends by providing implications for future research to "describe the patterns of relationships among a system of components and events as they interact and mutually define each other in real situations" (p. 15). I found that to be particularly informative because of its belief that media (LMS/Twitter) can influence relationships between events (overall student participation) and interactions (social presence and sense of community). By combining the statistical analysis and interrelationships of empirical research with the thick, rich description of qualitative data, this project might add new topics of discussion to the work of Kozma (1994) and Clark (1994). These new topics could include the communicative satisfaction of participants using certain electronic mediums of transmission, the influence these electronic mediums have on various levels of participation, and the sense of togetherness and amount self-disclosure afforded by certain electronic mediums of transmission.

In many ways, the work between Kozma (1994) and Clark (1994) centers upon the idea of modality. Modality means a particular form of perception is used to communicate messages back and forth from sender to receiver. In this research project, microblogging was the modality in which students communicated with one another in a distance education course. It is a contention of this research project that this mention of instructional experience or environment, applies to both traditional forms of discussion forums and to nontraditional communication platforms such as Twitter. Today's university students are awash with new forms of communicative technologies that make traditional forms antiquated and outdated. Students are drawn to educational technology that mirrors that of their social lives and that can be applied in other environments outside of academia.

This supposition is based on a developer-based or determinist theory of innovation. Within this paradigm, advancements in technology are unavoidable and necessary for developing effective instructional products. Surry and Farquhar (1997) stated that "theories in instructional technology assume that the best way to bring about educational change is to create a system or product that is significantly superior to existing products or systems" (p. 32). That comment demonstrates the need for the distance education discipline to continue to supplement its curricula with advanced technologies. This perspective relates to the medium discussion due to its connection with higher education institutions commitment to providing the most effective distance education experience possible. The global pandemic revealed the need for colleges and universities to view distance education as viable option for students to complete their

academic studies. Advancements in communication technologies has provided a platform in which to create online courses that are similar to those with a face-to-face structure. Murphy and Stewart (2017) present compelling arguments as to the factors associated with unsuccessful course completion for online students. One finding that relates to this study is the online participants expressed a relatively high levels of disengagement in despite the fact that they were enrolled in a face-to-face lab component. An interpretation of this finding is that there are certain elements of a distance education course that discourage participation and engagement. It is a main intention to investigate what those elements might be.

The Clark and Kozma debate inform my study in two distinct ways. First, Clark and Kozma present two different perspectives on how modality choice can influence key distance education practices such as social presence and sense of community. Investigating the influence of a new communication technology such as microblogging could result in a new perspective on the Clark and Kozma debate. Secondly, Clark and Kozma enable this study to further the discussion as to what it means to achieve certain learning outcomes via communication media. Providing a compare and contrast model between microblogging and a traditional LMS could demonstrate the varying degrees of effectiveness. This approach could move the debate away from whether a medium was effective or not. It remains to be seen if the modality of microblogging is strong enough to influence students' social presence and sense of community and ultimately their overall participation. It is a belief of this project that the more desirable, more dynamic modality of microblogging will positively influence those key factors.

Historical Context: Discussion Forums

Discussion forums were meant to supplant some of the communicative challenges associated with listservs. Listservs were one of the first communication channels that professional and governmental agencies used to disseminate detailed information to multiple recipients. Although that mode of transmission is effective in communicating details to many recipients, it fails to create an environment in which meaningful dialogue can take place between sender and receiver. That missing element of communication led to the creation of discussion forums. Thus, discussion forums began to gain popularity in the early to mid-1990s (Green & Gilbert, 1995; Friend & Cook, 1992).

Unlike listserv communication, in which information is shared in a one-directional manner from sender to receiver, discussion forums act as asynchronous chat rooms, a designated location within an LMS where participants write their thoughts, feelings, and opinions in hopes of others reading and possibly responding to their reflections. Individuals can create a single conversation or "thread" that connects their thoughts and opinions within a more expansive dialogue. Discussion forums afford participants the opportunity to complete the feedback model by adding their perspectives as a larger dialogue unfolds.

Distance education scholars believe that online discussion forums have the potential to positively influence student participant, learning outcomes, and knowledge construction (Thomas, 2002; Brown & Green, 2009). Both Thomas (2002) and Brown & Green (2009) report that these aforementioned constructs, when incorporated and

distributed properly, promote feelings of positivity and satisfaction in their online courses. In particular, discussion forums can serve to bridge the personal and digital that students often express as a potential drawback when comparing their experiences in a face-to-face environment. Thomas (2009) and Brown & Green (2009) contend that discussion forums allow for educators to connect with their students in ways that a correspondence or asynchronous does not. This influence has led many instructors and higher education institutions to view discussion forums as a significant component to the creation of effective distance education curricula. Whether they be asynchronous or in real-time, discussion forums serve as the main source of direct communication between students and instructors.

Students routinely state that they often feel disconnected with their classmates in an online environment (Phirangee & Malec; 2017). Thus, it is incumbent upon the instructor to create an environment much like that of a face-to-face classroom so that students feel motivated to interact and relate to one another. Instructors often use communication mediums such as discussion forums to bridge the interaction gap between face-to-face courses and distance learning education (Miyazoe & Anderson, 2010). Many students believe this level of communicative engagement is a key element of what constitutes an effective online course (Allen, Mabry, Mattrey, Bourhis, & Titsworth, 2004). Communicating with one another can create social and personal bonds between students that narrow the digital distance felt by students in a distance education course. This impression of togetherness and feeling of personal reciprocity create two elements associated with effective distance education curricula: sense of community and social

presence. When used and moderated correctly, discussion forums can create a sense of community, social presence, and increased collaboration (El Mansour & Mupinga, 2007; Herring, 2004; Farmer, 2004).

Fostering an environment of communicative engagement necessitates further research. Much research has been devoted to investigating the influence of traditional discussions on distance education courses. However, one medium that has been overlooked in this regard is microblogging. The prevalence of microblogging has had a profound effect on how people communicate. Microblogging inherently creates many of the attributes that students desire for their online courses. Microblogging has the potential to bring people together (sense of community), express personal thoughts, feelings (social presence). This potentiality includes such characteristics as mobile-friendly access, the ease of using emojis or other popular graphical illustrations for communication, and the ability to connect to a much larger community of interested parties based on the discussion at hand. Features such as these demonstrate a friendly, more personable side to the speaker that helps to decrease the digital divide when communicating in an online course. Reducing this digital divide, the feeling of being disconnected from others in an online environment, encourages the frequency and depth of dialogue and thus an overall increase in social presence and sense of community.

Moreover, microblogging contains many of the features found in traditional discussion forums. More research is needed to further investigate the potential impact that social media might have on higher education environments. More specifically, I wanted to determine how the dynamic nature of social media microblogging compared

with traditional mediums (LMS) regarding three key constructs associated with distance education: social presence, sense of community, and user-interface design (Tu, 2000; Rovai, 2002).

Historical Context: Student Engagement

A growing debate among educational institutions is how to increase the participation, involvement, and overall interest students might have in their chosen curriculum. In many ways, these terms can be placed in a broader category known as student engagement. Although there are many definitions of student engagement, one of the most succinct originates from the Australian Council for Educational Research (2010), which defines student engagement as the "time and effort students devote to educationally purposeful activities." This definition encompasses many of the aims and objectives that educators seek when developing a course curriculum.

Many recent studies have further investigated the importance and influence of student engagement from the perspective of students and instructors (Kahu, 2013; Parsons & Taylor, 2011; Trowler, 2010). Many aspects of student engagement have been investigated from a quantitative assessment (attendance, grades, quantity of discussion posts) and a qualitative approach (enjoyment, interest, critical thinking). Regardless of the approach, the findings reveal that engagement matters. That link between increased

levels of engagement and positive student outcomes has resulted in institutions of higher education placing renewed interest in creating environments that encourage student engagement.

Scholars of note associated with student engagement are Baldwin & Koh (2012) and Young and Bruce (2011). Koh's (2009) work described "the evolution of the student engagement concept and explain(s) its importance to student development" (p. 683). Koh's (2009) review demonstrates the relationships between student engagement and its influence on key academic initiatives such as student experience, participation, and instruction application. Not only did Koh's (2009) review demonstrate why student engagement is important, it also showed how student engagement has been investigated and applied in various academic environments.

Young and Bruce (2011) used the National Survey of Student Engagement (NSSE) to measure the degree of engagement for online college students. Young and Bruce (2011) built upon Koh's work (2003) by defining student engagement as "the efforts of the student to study a subject, practice, obtain feedback, analyze, and solve problems" (p.101). Young and Bruce (2011) found that "online students reported higher levels of engagement than both freshmen and senior on-campus students on each of the four (NSSE) benchmarks: active and collaborative learning, enriching educational experience, level of academic challenge, and student-faculty interaction "These results substantiate one of the objectives of this project by illustrating that online courses can--when constructed properly--be just as engaging as a face-to-face course.

One of the most profound statements by Young and Bruce (2011) directly relates to the aims and objectives of this research project. They reported:

> "The online curriculum should actively engage students through challenging academic rigor, consistent and timely student-faculty interaction, a collaborative learning environment, and activities that enrich the development of the student. The Internet and related technologies have increased the opportunity for learning through the elimination of time and place constraints and the availability of flexible and innovative channels for interaction (p. 107)."

That quote demonstrates the specific elements of student engagement and the potential for new technologies (social media and Twitter) to further expand our understanding and application of student engagement. Young and Bruce (2011) set the foundation for future research to dig deeper into what it means to increase student-faculty interaction and to foster a collaborative learning environment. For the context of this study, collaborative learning could be classified as sense of community while fostering a collaborative learning environment could mean social presence.

Engagement plays a vital role in social presence, sense of community, and user interface design. Lin, Hung and Chen (2019) concluded that the more meaningful the learning activities (those of perceived value to current and future aspirations of the college students) the more likely the student is to find value in their online course. This finding demonstrates the potential, both negatively and positively, engagement can have on how much a student views their online course in relation to some of the inherent

benefits of face-to-face courses. Moreover, the work of Pike, Smart and Ethington (2012) "substantiate the socializing effects of academic environments", (p. 567) and that their findings "unequivocally demonstrate that student engagement is positively related to student learning" (p. 568). This scholar strongly connects student engagement and the perception that students experience in relation to social presence, sense of community their subsequent interaction with user interface design. In short, the data suggests that the more a student is engaged the more likely they are to relate to their fellow classmates (social presence), participate in discussions (sense of community), and their perceptions of how the overall user interface design connects with the course at large.

Historical Context: Social Presence

Communication scholars Short, Williams, and Christie (1976) argued that a fundamental element to online, person-to-person communication is related to the degree in which the sender and receiver feel connected, in some meaningful manner, to one another and to the online environment. That seminal research led other scholars to add depth and detail to those constructs. Although those scholars provided a fundamental understanding of social presence and sense of community, their early work did not consider other mass vehicles for communication, such as social media. Their original definitions were difficult to understand and to apply to social presence in online settings. Lowenthal (2010) presented a comprehensive overview of social presence and how it differs from other constructs, such as interaction and participation.

Lowenthal (2010) stated that the theory of social presence is perhaps the most popular construct used to describe and understand how people socially interact in an online learning environment. However, despite its intuitive appeal, researchers and practitioners alike often define and conceptualize this popular construct differently. In fact, it is often hard to distinguish between whether someone is talking about social interaction, immediacy, intimacy, emotion, and/or connectedness when they talk about social presence. Social interaction can be defined as number of posts or messages shared between and amongst participants. Immediacy can be determined by the length of time between shared messages. Intimacy, although admittedly more difficult to define, is words or phrases that have a personal connotation and reveal more individualized information. Emotion can be displayed through written expressions of feelings. Connectedness can be seen through the accumulation of all the constructs mentioned above through shared experiences and impressions.

Bailenson and Welch (2018) literature review of the term social presence cites Biocca (1997) as participations having "the access to the intelligence, intentions, and sensory impressions of another" (p.22). This concept of social presence, as defined as using social interaction, immediacy, intimacy, emotion, and/or connectedness, "has been considered to be particularly important within virtual environments with social actors" (Oh, Bailenson & Welch, 2018; p. 3). This statement illustrates the how the above-mentioned constructs relate to social presence and the impact that they can have on a participant's experience in an online course. Moreover, Oh, Bailenson and Welch (2018) state that "presence is needed for people to fully experience a virtual environment" (p. 2).

Investigating the relationship between social presence and additional constructs, such as microblogging and LMS, can be further developed once social presence is defined and identified.

The key features of Lowenthal (2010) are displayed in the form of a timeline.

1. 1976: Social presence (Short et al.).
2. 1979: Cluelessness (Rutter).
3. 1984: Media richness (Daft and Lengel).
4. 1992: Social information processing (Walther).
5. 1997 – Social presence (Gunawardena).

This historical understanding provided by Lowenthal (2010) influences my evolutionary understanding of social presence. Short et al. (1976) were the first to describe the phenomena as social presence and provides an origin story and contextual understanding. Rutter (1979) adds to the discussion by discussing particular elements of confusion and dissatisfaction associated with online communication. Daft and Lengel (1984) adds the term "media richness" to describe the environment one creates to promote social presence. Draft and Lengel (1984) define this media richness in terms of a paradigm; from "lean" to "rich" mediums or those that are more effective and less effective at creating social presence. The richest being face to face and the least being unaddressed documents (bulk mail, posters). This hierarchy of effectiveness helps educators better understand what types of media (and their aspects contained within) are the best at promoting social presence. Knowledge and incorporation of these features

would be beneficial to the overall user experience given the importance of adding the social presence construct to an online course. Walther (1992) adds the social processing of information in online information. Gunawardena (1997) more clearly defines the terms of social presence in relation to CMC (computer-mediated communication) and its influence on the individuals and groups interacting in these environments.

This historical literature informs my study in three distinct ways. First, this scholarship describes the origin and evolution of social presence. It is vital that future research understand how the phenomenon started, the settings in which it was generated, and the progression from its foundational principles. With this knowledge, I will be able to build upon the corpus of knowledge and thus offer new understanding of how the concept of social presence can be applied and understood in current contexts. Second, this literature detailed the various methodologies used to understand the concept of social presence. It is one of the intentions of this project to fill in some of the gaps in the research by offering a mixed methods approach to investigating social presence. Third, reviewing this literature made it apparent that social presence could be applied to new technologies, in this case social media. Investigating the relationships, if any, between social media and social presence could generate renewed interest in the concept and information technologies.

Additionally, Lowenthal (2010) offered three phrases associated with interdisciplinary research regarding social presence:

- 1970s: Telecommunications (key figures were Short et al.): Mass media broadcasting.

- 1980s and early 1990s: Computer mediated communication (CMC) and management information systems (MIS) (key figures were Rutter & Daft and Lengel, Kiesler, & Walther): Group communication in project environments.
- Mid 1990s to early 2000s: Online learning (key figures were Gunawardena, Rourke et al., Tu and Swan): Investigating key components of effective distance education design.

The timeline provided by Lowenthal (2010) provides a foundational understanding of various disciplines connected with the concept of social presence. Fundamentally speaking, the various changes that took place during the 1970s and early 2000s in distance learning can be attributed to the medium used. In each case, technology necessitated that distance education operate in different domains, starting with telecommunication, computer mediated communication, and into online learning.

More modern scholarship has explored Draft and Lengel's (1984) information and media richness model and its place in today's educational environments. This concept of media richness has been applied to social media, brand loyalty, friendship, and virtual communities (Liao & Teng, 2018; Hasim, Shahrin, Wahid & Shamsudin, 2020; Tseng, Cheng, Yu, Huang & Teng, 2019). This new scholarship has increased the interest in how technology, online education and social presence intersect. Ishii, Lyons and Carr (2019) report that "student satisfaction with online communication with the instructor and classmates positively contributed to online course satisfaction" (p. 127). This statement informs my study because it demonstrates the positive relationship with student

satisfaction and communication. A principal inquiry of this study is to further investigate the components of student satisfaction with relation to the concepts of social presence, sense of community, and user-interface design.

Walther and Burgoon (1992) were one of the first scholars to investigate the communicative patterns of individuals when interacting in an asynchronous, computer mediated environment. They recognized that early forms of technology "dehumanized", the ability to connect on a mental or relational level, the communication process due to the absence of nonverbal cues. This finding is important to this study because it shows that a participant's perceptions of satisfaction, quality, engagement, and/or participation can be influenced by the technology itself.

Walther (2018) has built upon his work by investigating the social identification-deindividuation model in computer-mediated communications. This is new information increases the need for further investigation into how new forms of communication technologies (such as microblogging) may promote individualistic perspectives over that of the group. Walther (2018) study states that

> "The article chronicles how tensions between interpersonal and intergroup approaches led to reevaluations of research methods, to measures, and to critical tests of the perspectives, and how these developments ultimately led to reformulations and the evolution of explanatory models from both the intergroup and interpersonal domains" (p. 86).

This quote informs my study due to its entry into individual dynamics versus intergroup formalities when communicating online. Microblogging is inherently individualistic while LMS are shown to be more group-centered in structuring communication. Additionally, Walther (2018) suggests a reformulation and evolution of the previous models concerning communication theory and computer mediated communication.

Starting with the work of Short et al. (1976), scholars described the impact--both positive and negative--and overall value of informal communicative connectivity. Short et al. (1976) developed a social presence model that provided a conceptual understanding and fundamental application of what they described as the "degree of salience of the interpersonal relationships . . ." (p. 65). In summary, Short et al. (1976) stated that a key element to developing an effective computer-mediated communication (CMC) is the perception of students to "feel" that their peers and instructors are "real people." According to Short et al. (1976), the constructor of social presence can be described in terms of "expressions and perception of emotion through intimacy and technological immediacy" (p. 11). Moreover, Short et al. (1976) stated this feeling of interpersonal connection is based on the quality of the medium and the communicative patterns contained within. That belief substantiates many of the suppositions of this study that the technology used to communicate matters. The technology used could influence, positively or negatively, key factors associated with effective distance education curricula.

Following in the footsteps Short et al. (1976), research by distance education scholars Gunawardena and Zittle (1997) and Tu (2002) has been identified as a seminal contribution to exploring the impact of social presence in an online course. Gunawardena and Zittle (1997) defined social presence as "the degree to which a person is perceived as 'real' in mediated communication" (p. 8). Gunawardena and Zittle (1997) found that the participants' social presence was a strong forecaster of a student's perception of satisfaction within a computer-mediated conferencing environment. One of the aims of this study was to contribute to the work of Gunawardena and Zittle (1997) by exploring the influence of social media on social presence and thus on students' perception of satisfaction. Research by Gunawardena and Zittle (1997) found and separated a key component to building an effective distance education course (social presence). My study has been aimed to investigate the media that produces more or less social presence.

Building upon the work of Gunawardena and Zittle (1997), Tu (2002) created the CMC (computer-mediated communication) Questionnaire "to measure online social presence and privacy" (p. 136). Tu (2002) stated that one of the most significant factors for improving instructional design online, is the creation of a strong social presence. Tu and McIsaac (2002) defined social presence "as the degree of awareness of another person in an interaction and the consequent appreciation of an interpersonal relationship" (p. 133). In addition to presenting a fundamental understanding of social presence, Tu and McIsaac (2002) illustrated the importance of "selecting the appropriate computer-mediated communication medium and applying appropriate instructional elements to

course design" (p. 131). The work of Tu and McIsaac (2002) provided my study with a platform in which to connect social presence with CMC mediums.

More recent CMC research has shown that emojis, graphical illustrations, and filters have added to the description of online social presence (Tang and Hew, 2019; Nadler, 2020; Meier & Reinecke, 2021). This new scholarship describers the interconnectivity between sociocultural occurrences and CMC. Humans are communicating differently when online in ways that influence (positively and negatively) how a group discussion may be interpreted. These new form of communication and technologies gives additional viability and need for a project such as this. Microblogging and LMS continue to be some of the more popular forms of CMC.

Another influential group of scholars associated with social presence is that of Garrison, Anderson, and Archer (2001). Garrison et al. (2001) created the communities of inquiry (CoI) framework, which is regarded as the most influential model for social presence investigation. Garrison et al. (2001) defined "three critical elements in the experience of conducting higher education using online communication media; Social Presence, Cognitive Presence and Teaching Presence" (p. 5; Garrison et al., 2010). Garrison (2010) stated that social presence can "be defined in terms of the participants identifying with the community, communicating purposefully in a trusting environment and developing interpersonal relationships" (p. 7; Garrison et al., 2010).

New research has been conducted in CoI that further develops the work of Gunawardena and Garrison et al. Kim and Gurvitch (2020) review connects online

education with CoI constructs. Kim and Gurvitch (2020) propose that new contexts and scenarios to apply CoI features. Additionally, Almasi and Zhu (2020) conducted a mixed methods study connecting CoI with cognitive presence, and overall student performance. This study is particularly insightful as it relates to this study in relation to its similar methodology and theoretical implications. Almasi and Zhu (2020) used qualitative methods to inform their exploration into how discussions and presentation influenced teaching presence and the cognitive presence of its participants. This study adds to the work of previous scholarship by adding new environments (blended learning communities) and new methodologies (qualitative). The findings of Almasi and Zhu (2020) support the argument that higher cognitive presences felt and experienced by online students can lead to a positive increase in student performance.

It is important to consider the work that has been done in the field of distance education since the early 2000s. Scholars such as Roblyer, McDaniel, Webb, Herman, and Witty (2010), Veletsianos and Navarrette (2012), and Wei and Chen (2012) have discussed the influence of social media on distance education. The work of these scholars come from educators incorporating social media interactions into their curriculum. This work provides a gateway into further research into CMC. Their scholarship provided a fundamental understanding on the influence of new communication technologies (in this case social media) on key pedagogical practices. Roblyer et al.'s (2010) seminal piece on faculty perceptions and use of Facebook sparked meaningful dialogue on how higher education institutions might incorporate social networking sites into their curricula. Research by Roblyer et al. (2010) described the positive influence that social media could

have on higher education objectives, such as learning outcomes, student participation, knowledge construction, and overall engagement. The research produced by those scholars signaled a shift away from domain-seeking to more technology application. Veletsianos and Navarrette (2012) added to the discussion presented by Robyler et al. (2010) by demonstrating the positive impact that social media can have on student enjoyment, appreciation, and overall satisfaction.

Wei, Chen, and Kinshuk's (2012) research demonstrates how academia could leverage the affordances of social media platforms by adding the concept of social presence. Wei, Chen, and Kinshuk's (2012) questionnaire addressed the various thoughts and feelings students experience in an online learning environment. Using structural equation modeling, Wei, Chen, and Kinshuk (2012) collected and analyzed 522 responses that resulted in three main themes for the co-creation of social presence in distance education courses: co-presence (reciprocity; mutual feelings of connection), intimacy (the depth of sharing), and immediacy (the response time between messages sent and received). These sub-constructs come from the theoretical foundations associated with social presence. Wei, Chen, and Kinshuk (2012) explored how negative online educational experiences highlight the importance and development of the social cognitive theory. Their framework helps me better understand this communicative phenomenon by classifying co-presence and intimacy in terms of words and phrases used by participants, and the time in between messages (with shorter time periods) signaling a greater degree of immediacy and thus overall communicative connection. Wei, Chen, and Kinshuk (2012) identified user interactivity, social cues, user interface, and richness of media as

key determinants for whether a participant feels a sense of social presence. Demonstrating the value of the terminology used by Wei, Chen, and Kinshuk (2012) lends additional credibility to notion that the medium of communication does influence the overall online educational experience.

The work of Roblyer et al. (2010), Veletsianos and Navarrette (2012), and Wei and Chen (2012) stated the need for additional research that connects key elements of early distance education scholarship (social presence) with new forms of technology such as social media. One of the hypotheses of this study was that the dynamic nature of microblogging will increase the feeling of social presence for both students and instructors. Microblogging has a strong ability to connect people to one another (co-presence), allowing for freedom of expression (intimacy) and mobile access (immediacy) (Chung & Lim, 2002).

Although all of those scholars contributed to the current understanding of social presence, the definition and instrument provided by Garrison et al. (2001) investigated the influence LMS and microblogging had on social presence in an online learning environment. The work of Garrison et al. (2001) is the most aligned with the aims of this study because of its focus (distance education), context (teaching and technology), objective (examining social presence), and the opportunity to use CoI scale to measure the degree of social presence. Garrison et al.'s (2001) definition and CoI framework provided a verified, credible, and widely recognized structure in which to examine the influence of LMS or microblogging on social presence. Although Gunawardena & Zittle (1997) and Tu & McIsaac (2002) are important pieces of literature for exploring social

presence, they do not fit this study as well as Garrison et al. (2001) due to their lack of viable instrumentation.

Garrison et al. (2001), Lowenthal & Dunlap (2018), and Gunawardena & Zittle (1997) show that the more social presence, rapport building, positive communicative patterns, and self-disclosure expressed by the instructor, the more likely students will engage, interact, and participate in an online course. One of the primary interests of this study was to determine how the interactive capabilities of microblogging influence social presence.

Historical Context: Sense of Community

People want to feel connected to one another. Since the dawn of civilization, humans have had a strong desire to create, build, and solidify a sense of community. According to McMillan and Chavis (1986), this connection forms a social fabric that increases an individual's coping skills, resiliency, and ability to form stronger, more lasting interpersonal relationships. McMillan and Chavis (1986) built upon the theory developed by Gusfield (1975) by adding five key elements to this sense of community: membership, influence, integration, fulfillment of needs, and shared emotional connection. Positive face-to-face interactions have been shown to accomplish these five features of the elements listed above. People create and strengthen relational bonds by interacting with one another in both verbal and nonverbal messaging. The challenge

poised to distance education instructors is to produce these same opportunities for connectiveness within a technological intermediary.

The affordances of modern technology (high-speed internet, mobile technology, broadcast communication) have enabled humans to transcend geographic and familial boundaries that build a global sense of community. Arguably, the most influential technological advancement for building this connectivity has been social media. Starting with email and instant messaging, internet users were able to send digital messages to one another with a speed and reach that was unparalleled. Although the original purpose of that technology was the transfer of information, users began to use social media as a means to build interpersonal relationships (Hu, Wood, Smith, & Westbrook, 2004). Social media sites such as Facebook, Instagram, and microblogging afford the user the ability to create identity, reach out to those with shared interests and beliefs, and ultimately to form communities of social bonds. People of all ages now use social media to start intimate relationships, bond over shared interests, and communicate in personal and meaningful ways (Luo & Hancock, 2020).

Dr. Alfred Rovai of Regent University in Virginia is a prominent scholar in the distance education community. His work includes research into blended learning environments, perceived cognitive learning, persistence, and sense of community. Rovai (2002) stated that there are two key concepts: immediacy and intimacy social presence and three dimensions (social context, online communication, and interactivity) for sense of community. After conducting his mixed method study, Rovai (2002) redefined sense of community "as the degree of feeling, perception and reaction to another intellectual

entity in the CMC environment" (p. 146). Rovai (2002) described some of the reasons why distance education courses are not considered as effective as face-to-face interactions. Rovai (2002) claimed that physical separation, feelings of disconnection, isolation, distraction, and lack of attention contribute to one's lack of participation. Rovai (2002) stated that an increased sense of community and creating interpersonal relationships work to combat negative outcomes.

Rovai (2002) reported that "strong feelings of community may not only increase persistence in courses but may also increase the flow of information among all learners' availability of support, commitment to group goals, cooperation among members and satisfaction with group efforts" (p.3). Rovai (2002) defined the class community into four dimensions: spirit, trust, interaction, and commonality of expectation and goals (p. 4). Additionally, Rovai (2002) found that seven factors contribute to this community construct: transactional distance, social presence, social equality, small-group activities, group facilitation, teaching style and learning stage, and community size (p. 7).

Building a sense of community is an important factor in developing an online course (McInnerney & Roberts, 2004; Rovai & Jordan, 2004). Students report that their lack of involvement and commitment in their online courses related to the absence of "community." A distinct advantage of face-to-face courses is the ability for students and teachers to build rapport and to relate to and collaborate with one another in a more organic manner without the artificial boundaries associated with distance education courses. Distance educators have tried to replicate some of the communicative

opportunities afforded by unmediated means associated with face-to-face interactions. A popular solution to this challenge has been to create discussion forums.

Students can often feel isolated or separated from their peers because of the limitations of traditional discussion forums to produce key elements of community. Those limitations include brief postings, trite replies, ambiguous commentary, and lack of emotion, all of which have contributed to the notion that traditional discussion forums are a "cold medium" (McInnerney & Roberts, 2004). That perception has been created in part because of distance education software's inability to provide instant feedback that students often feel they need to succeed. Moreover, Vesley, Bloom, and Sherlock (2007) reported "that learning involves interaction and that it is a communal activity" (p. 234). The impact of social interaction on learning is well documented (Soller, 2001). Online instructors should decide what actions, features, and activities best facilitate this sense of community. Without this communal communication, participants might feel disconnected, dissatisfied, and disenfranchised.

Students who have experience in both face-to-face and distance education environments say that this missing element for online courses, "a sense of community," is one of the major drawbacks of online courses (Song, Singleton, Hill, & Koh, 2004; Richardson & Swan, 2003). Those findings are similar with other literature that states the positive influence that building a sense of community can have on learning outcomes, such as student satisfaction and knowledge construction (Palloff & Pratt, 2007).

Those studies demonstrate the significant influence that sense of community can have on a distance education course. Course designers, instructors, and administrators should be mindful of the necessary elements that create community if they want to reap the rewards of increased engagement. In addition to describing the importance and impact of building a sense of community, those studies also suggest ways educators can create community. Some elements that have been shown to create community include creating avatars, forming groups, self-identifying a topic or subject matter, and discussion forums. Self-disclosure is another element that can create a sense of community for online learners. Self-disclosure can include providing a historical background of oneself, displaying a self-portrait or image that is representative of one's personality and interests outside of the classroom.

Those suggestions are well aligned with the affordances & features associated with microblogging. Microblogging allows the user to choose their own image (avatar), to create community pages (using hashtags), and microblogging trending topics. It is a hypothesis of this project that the unique features of microblogging can lead to a greater sense of community. The more comfortable and relatable a student feels to their peers and to their instructor, the more likely it is that they would engage with the curriculum and thus would be likely to formulate construct knowledge.

Historical Context: Microblogging in Higher Education

Microblogging was created on March 21, 2006, by Noah Glass, Jack Dorsey, Evan Williams, and Biz Stone. Its original intent was to serve as a quick and

interpersonal communication tool known as a short message service (SMS). Microblogging enables a user to share small amounts of information with "followers." Microblogging users can "follow" other users and can form a digital, interpersonal relationship. Tweets were initially limited to 140 characters, but in 2017, the limit was increased to 280 characters. Some 500 million tweets are sent daily, which equates to approximately 200 billion tweets per year (Sayce, 2019). Each microblogging user has an average of 200-300 followers, which is up 340 % from 2012 (MacCarthy, 2016). That data demonstrates the significant sociocultural and communicative power of Twitter. Its immense popularity, coupled with its dynamic technical capabilities, warrants further investigation into its influence on human communication.

Junco, Heiberger, and Loken (2011) wrote one of the seminal pieces concerning the use of microblogging in higher education. Junco et al. (2011) explored the impact microblogging would have on students' social engagement and grades. Junco et al. (2011) used ANOVA (Analysis of variance) testing to report that the "experimental group had a significantly greater increase in engagement than the control group" (p.119). Additionally, Junco et al. (2011) found that students and faculty using microblogging "were both highly engaged in the learning process in ways that transcended traditional classroom activities" (p. 119). Junco et al. (2011) concluded that their study "provides experimental evidence that microblogging can be used as an educational tool to help engage students and to mobilize faculty into a more active and participatory role" (p. 119).

Those statements support my argument that microblogging can be an effective medium to achieve key components of what constitutes an effective distance education curriculum, such as social presence and sense of community. The work of Junco et al. (2011) provides a foundation on which to add to the quantitative understanding of this phenomenon. My research added to the corpus of knowledge by setting the control group as a traditional LMS with the experimental group being social media (Twitter). The reach, features, and sociocultural impact that microblogging possesses offer a tremendous opportunity for higher education to explore the positive influence it might have on curricula and specifically on distance education. The work of Junco et al. (2011) was instrumental in providing a primary building block for further exploration into the influence microblogging can have on a distance education course. More specifically, further research is needed to explore how educators might be able to leverage the communicative advantages of social media (Twitter) with the core competencies--social presence, sense community, and overall participation--associated with distance education curricula. It is the intent of this project to use the research of Junco et al. (2011) to further substantiate their claims that microblogging is a great resource to increase the three core competencies.

Along with Junco et al. (2011), Kassens-Noor (2012) was one of the first scholars to study microblogging in an academic environment. Kassens-Noor's (2012) intention was to "explore the teaching practice of microblogging as an active, informal, out-of-class learning tool" (p. 9). Additionally, Kassens-Noor (2012) stated that "the goal of this story is to stimulate scholarly discussion about microblogging as an active, informal,

outside of class, peer-to-peer interaction tool that aids the in-class learning process" (p. 12). Prior to the work of Kassens-Noor (2012), many instructors used microblogging in class to facilitate in-class discussions. This study was unique because it compared traditional teaching methods used outside of the classroom (diary writing) with that of Twitter. Their research design was influential in setting up my project. Kassens-Noor (2012) enabled me to see how various educators viewed microblogging as an educational tool and how they incorporated microblogging into their curriculum. Specifically, Kassens- Noor (2012) state specific microblogging rules that mimic that of traditional LMS discussion forums. This close replication process enables researchers and educators to better compare and contrast microblogging with more traditional communication environments.

Additionally, Kassens-Noor (2012) study showed that the students using microblogging demonstrated higher levels of co-creation of knowledge than that of their LMS peers. Kassens-Noor (2012) attributes this increase to microblogging encouraging students to share with others outside of those enrolled in the class. The ability of participants to readily access outside perspectives (those not limited to those enrolled in the class) is an important characteristic of microblogging in which to consider. It is a key inquiry of this study to investigate how this unique trait, in relation to LMS discussion boards, might influence the relational components of communication in an online course. Much like the research of Kassens-Noor (2012), my research project compares a traditional LMS with that of social media (Twitter) and how these features influence the relationship between students' and instructors' perceptions of quality instruction.

In my research project students were asked to use microblogging daily and were encouraged to tweet multiple times a day. A key finding in the Kassens-Noor (2012) study was that microblogging served as a better platform for group discussion "because microblogging facilitates sharing of ideas beyond the classroom via an online platform that allows readily available access at random times to continue such discussion" (p. 19). The Kassens-Noor (2012) study has proved instrumental for the purposes of this study because of its findings that Twitter's features (instantaneous, availability) created an environment superior to that of traditional LMS for discussion forum interactions.

Among the first scholars to review the literature regarding micro-blogging in education (MIE) were Gao, Luo, and Zhang (2012). Gao et a. (2012) created a standard of scholarship associated with the relationship between distance education and micro-blogging. Goa et al. (2012) reviewed "22 major referred academic journals in educational technology" (p.785) that resulted in 50 articles, only seven of which met the qualification standards. The subsequent rounds of searches added three additional educational databases--a Google search connecting keywords "Twitter," "microblogging," and "learning" and "education". From there I used the snowball sampling method to locate citations from previous selected studies. These additional searches resulted in an additional review of 21 papers. Gao et al. (2012) reported that "among the 21 studies, only one was an experimental study" (p. 788). That staggeringly small percentage shows the need for more empirical research methods that connect micro-blogging with higher education. By nature, descriptive studies are limited in the way they describe relationships between variables. Questions of how, when, why, and how much are better

suited for quantitative methodologies. By using a mixed method approach, I employed a statistical analysis to better understand the participants' experiences while using qualitative measures to provide a thick, rich description of the instructors' experiences.

Gao et al. (2012) microblogging "made it easy for the audience to ask questions, have discussion and share resources" and "allows presenters to respond dynamically to audience reactions" (p. 789). In addition to an increase of in-class participation and engagement, one of the latent benefits described by Gao et al. (2012) is that micro-blogging could encourage increased virtual participation. Gao et al.'s (2012) findings support this belief; they noted that "learning took place in dots of actions (walking in corridors, in cars, during lunch breaks) that were composed of small, discrete moments rather than in a linear and sequential manner" (p. 789). I believe that such "dots of actions" will lead to more meaningful, insightful discussion because of the connection participants make between real-world experiences and distance education concepts.

Gao et al.'s (2012) review includes a finding that micro-blogging produced sustained engagement and increased opportunities for learners to engage with each other, with the material, and with their instructor. Gao et al. (2012) reported "that students asked more questions and engaged faculty more when they were on microblogging than on an alternative social learning environment" (p. 790). That statement is critically important to this study because as it support my hypotheses that microblogging will lead to higher levels of their sense of community and social presence than that of LMS. Gao et al. (2012) also stated: [T]he formation of a learning community is a dominant theme across studies and that microblogging increased student-instructor and student-student

communication, enhanced social presence, built a strong learning community, and largely reduced the sense of isolation among student groups (p.791).

That statement perfectly exemplifies the rationale of this study. Microblogging (Twitter) can be a powerful tool for instructors to use to increase student participation, individualism, interconnectivity, and sense of community.

Goa et al. (2012) offered suggestions for future research as they concluded their review of literature. They reported that many studies provided "limited information on participants and settings, implementation procedures, or types of data collected and analyzed" and that there was a need for "powerful data analysis methods" (p.793). That statement is paramount to my study. The work of Goa et al. (2012) gives validity to my quantitative approach. It was the intention of this study to utilize descriptive and inferential statistics to analyze the communication data gleaned from LMS and microblogging and to apply it to the two key social constructs--social presence and sense of community. The benchmarks set by Gao et al. (2012) led me to choose the empirical methodologies that I incorporated to add and strengthen the corpus of current literature focused on micro-blogging in academia.

Goa et al. (2012) work presents gaps in the literature that my study intends to fill. My research added to the corpus of knowledge by implementing an empirical, mix-method design that presents a clear, valid, and reliable approach to investigating this phenomenon. I hypothesized that microblogging is a better medium for discussion forum exchanges than that of LMS due to the former's more-dynamic features. Microblogging

offers a superior mobile application than that of LMS. Its simplicity creates opportunities for more-dynamic, spontaneous communicative interactions. Additionally, microblogging offers a more dynamic user interface than that of LMS because of its simplicity in communicating and responding to others, its icon development (likes and retweet features), and its mobile alerts (informing users when someone responds to your original tweet).

Expanding on the work of Goa et al. (2012), Tang and Hew (2017) presented a comprehensive review of key literature from 2006 to 2015. Tang and Hew (2017) used five factors for their eligibility criteria: microblogging was the medium of social interaction, the research was conducted in an educational setting, there was a clear description of how microblogging was used in the curriculum, the empirical research was published in a peer-reviewed journal. Tang and Hew (2017) reported that out of the 51 eligible studies, only nine (17%) were experimental, with the vast majority being descriptive. Tang and Hew (2017) stated that scholars "can hardly draw any definite causal relationships based on studies that are mainly descriptive" (p.101).

Tang and Hew (2017) cited four relationships associated with microblogging in academia: learner-interface, learner-content, learner-instructor, and learner-learner. The two constructs that informed my study the most were learner-instructor and learner-learner. Instructors play a central role to students' acceptance, understanding, and utilization of microblogging in their courses. Instructors should anticipate some initial hesitation and resistance by students asked to learn a new technology in their studies. However, Tang and Hew (2017) reported that the more the instructor effectively

communicated the result was “an increase in students’ social engagement and grades” (p. 111).

Tang and Hew (2017) cited only one of the 51 eligible studies (Prestridge, 2014) that explicitly examined the interactive potential of microblogging between student and instructor. This dearth of research demonstrates a clear need for this study. The qualitative portion of this mixed method study was devoted to exploring the experiences and perceptions of instructors using LMS or microblogging for their discussion forum assignments. An interesting point made by Tang and Hew (2017) stated that “substantive interaction between students and the instructor was found when students initiated a dialogue by tweeting a question, and the instructor responded by questions to extend students’ thinking” (p. 107).

Tang and Hew (2017) posed a poignant question that asked, “Is microblogging merely a supplementary means of interaction, or does it have the potential to replace learning management systems such as LMS or Moodle?” (p. 110). I found this question particularly interesting because it related to a broader application of microblogging in higher education. Traditional LMS platforms such as LMS limit access to the course material to only students enrolled in the curriculum. Twitter’s wider range of participants could lead to additional information sharing and thus greater social presence and sense of community. The inclusion of those not enrolled in the course could increase the depth and breadth of the discussion. The potential for such “outsiders” to offer a different perspective is relevant to my study in that it allows for a greater number of voices to enter

the dialogue. This diversity of thought could lead to a positive influence on two key constructs of this research design: social presence and sense of community.

Tang and Hew's (2017) review of literature provides scholars with a fundamental understanding of existing literature, gaps contained within the literature, and suggestions on how to fill gaps. One of the most salient points presented by Tang and Hew (2017) is how they present various guidelines for the educational use of Twitter. Tang and Hew (2017) share five "best practice" for educators to consider as they incorporate microblogging into their curriculum. These recommendations serve as a fundamental understanding of the communicative strengths and weakness of microblogging in relation to integration within a distance education context.

Tang and Hew (2017) ended their review by suggesting that future studies utilize measures that are more quantitative measures to further explore the impact of microblogging on educational outcomes. I found the research of Tang and Hew (2017) to be instrumental in creating a research design that increases the corpus of knowledge related to the incorporation of social media into a distance education environment. Their work informs my study by proposing that microblogging can be used "as a formative assessment platform to gather students' instant feedback and reaction towards teaching and learning" (p. 09). Additionally, Tang and Hew (2017) provide a summary for previous literature concerning incorporating microblogging into an educator's curricula. Their summaries provided this study with a road map in which to further explore the literature leading up to 2017. Tang and Hew (2017) provided a framework in which to build a mixed methods approach that could offer a new quantitative perspective that is

missing to the overall discussion of how distance education can be improved by using social media technologies. Lastly, Tang and Hew (2017) provide two suggestions for future that are well aligned with this study. The first suggestion is to explore "how different students experience microblogging and are engaged by it" (p. 112). This study's sample will include older, nontraditional, and graduate level student would be different from many of the studies reviewed by Tang and Hew (2017). Second, Tang and Hew (2017) state that "we need more research that examines the perspectives of course instructors' use of microblogging (p.112). A focal point of this study is to examine the experiences and perceptions of educators as they utilize microblogging as an educational communication tool.

Student Perceptions of Interaction and Guidelines for Incorporating Microblogging

Picciano (2002) was one of the first researchers to examine how performance is impacted by a student's level of interaction and sense of presence in an online course. This study differs from other studies because of its focus on course objectives rather than on other performance measures such as grades and withdrawal rates. Picciano's work (2002) is one of the first studies that explored the connection between a student's actions and perceptions and overall participation. Picciano's quantitative approach gives me insight into how to approach this phenomenon using a reliable and validated survey instrument. Picciano (2002) reported "a strong (statistically significant .05 level),

positive relationship (.6732) between student perceptions of their interaction in the course and their perceptions of the quality and quantity of their learning," (p. 28). A strong case can be made that aspects of quality could include social presence and sense of community.

Moreover, Picciano (2002) stated that the "correlation between perception of social presence and student interaction variables was highly positive (.8477) and statistically significant (.05 level)," (p. 28). Lastly, Picciano (2002) stated that "correlation between perception of social presence variable and the overall perception of learning variable was also highly positive (.6714) and statistically significant (.05 level)," (p. 28). Those statistics strengthen the argument for further investigation into the impact of social presence into overall student participation in an online course.

Picciano (2002) summarized his work by stating that "a strong relationship exists between students' perceptions of the quality and quantity of their interaction and their perceived performance in an online course" (p. 32). That statement has profound implications on what constitutes effective distance education design. Picciano's (2002) findings present a clear directive for distance education practitioners to place emphasis on how meaningful interactions influence key characteristics for effective distance education design. My study further shaped the discussion started by Picciano (2002) by addressing how social media can influence students' perceptions and creation of social presence and sense of community in a distance education course. One of Picciano's (2002) key contributions to distance education scholarship shows the impact these two constructs have on students' experiences while learning in a distance education course. However,

one missing element to Picciano's work (2002) is the influence of technology on the creation of these elements. It was an aim of this project to add to Picciano's (2002) by demonstrating the influence technology (microblogging) can have on the relationship between student interaction and their distance education experience.

Another seminal study was that of Dunlap and Lowenthal (2009): *Tweeting the night away: Using microblogging to enhance social presence*. Dunlap and Lowenthal (2009) "describe[d] our use of microblogging to encourage free-flowing just-in-time interactions and how these interactions can enhance social presence in an online course" (p. 20). Dunlap and Lowenthal (2009) contended that informal learning, those "playful interactions that happen before and after class" (p. 20) are important aspects to consider when developing a distance education course. They grounded their research within the framework of Vygotsky (1978) by stating the importance of social interaction to the learning process. Additionally, Dunlap and Lowenthal (2009) used elements of CoI and CMC to show the relationship between social presence and distance education courses. The relationship between Dunlap and Lowenthal (2009) and my work is undeniable. Both studies used CoI instruments and CMC as the context to explore the influence of microblogging in distance education courses.

Dunlap and Lowenthal's (2009) contribution to the body of literature includes a recommended procedural approach to how instructors can incorporate microblogging into their distance education courses. I found their guidelines to be instrumental to my research design. Their work serves as a type of checklist for best practices. It was an aim

of this research to update the work of Dunlap and Lowenthal (2009). The early work of Dunlap and Lowenthal (2009) showcased the academic potential of microblogging while my work sought to compare microblogging with LMS. This comparison might contribute to a re-evaluation by distance education instructors and higher education institutions of the overall value of traditional LMS versus social media resources.

- Veletsianos (2012) presented another seminal piece related to thematic patterns that emerged from using microblogging in higher education online curricula. Veletsianos' (2012) report describes the communicative patterns of scholars using microblogging for educational purposes. This scholarship used a qualitative approach to uncover the dominant themes that presented themselves in peer-to-peer communication. Veletsianos (2012) described seven themes that emerged
- from their data in relation to students' preference for interconnectivity in a distance education course.
- Instructors giving the students the opportunity to share information, resources, and media relating to their professional practice.
- Sharing information about their fellow classmates and instructors.
- The ability to request assistance and offer suggestions to others.
- Engagement in social commentary.
- Participation in digital identity and impression management.
- Making social, professional, and academic connections with others.

- Connecting their personal social media accounts with academic endeavors.

These seven themes influenced my research design and approach. Veletsianos (2012) presented topics for future academic discussions about the potential value of social media (Twitter) in distance education courses. I found Veletsianos' (2012) perspective on shared information, overall engagement, and network connections to be particularly salient to distance education development. Veletsianos' (2012) work demonstrates the need for distance education practitioners to consider the implications of interactions on students' perceptions of instructional quality and overall academic experience.

Veletsianos (2012) stated the purpose of his work was "to fill this gap in the literature by investigating scholars' practices in networked spaces" (p. 337). Veletsianos (2012) made the claim that social media can be a more dynamic, enriching, and meaningful resource for social presence and sense of community than traditional distance education software such as LMS. Veletsianos (2012) used the term repurposing to describe the process in which educators use microblogging for academic endeavors. Veletsianos' (2012) work helps to inform my own work by stating that microblogging is a place: where personal and professional identities blend and where participatory digital practices meet individual reflections, fragmented updates and social interaction. While several practices, such as resource sharing, are prevalent, scholars' participation in microblogging varies to accommodate multiple intended audiences, goals, and motivations (p. 345).

Saeed and Sinnappan's (2011) research were one of the first to compare Web 1.0 (basic HTML delivery, audio and visual broadcasting, and video recordings) with Web 2.0 technologies (social media, asynchronous media). Saeed and Sinnappan (2011) reported that a key element for creating a successful Web 2.0 design was to build a sense of satisfaction and social presence. Their (2011) work informed my study in two specific ways. First, Saeed and Sinnappan (2011) investigated the influence that microblogging had on intrinsic factors such as student motivation, perceived enjoyment, and subjective norms. Those factors differ from previous scholarship in which the focus was on extrinsic factors, such as assignment grades and participation scores. My study added to this topic by including other intrinsic constructs, such as social presence and sense of community. Secondly, Saeed and Sinnappan (2011) modified a pre-existing instrument to conduct their quantitative methodology. My study also used an adopted-scale instrument for the quantitative portion of my mixed method study.

Some of the findings reported by Saeed and Sinnappan (2011) include perceived enjoyment being the strongest predictor for adoption, noting the value of "today's highly interactive, social and multi-user technologies" (p. 1118). Saeed and Sinnappan (2011) concluded that because students enjoyed using Twitter, they were more likely to continue using it for communication purposes. Statements such as those underscore this study's hypothesis that the novelty and amusement of using social media in academia can positively influence the perceptions students have on a distance education course. Students' perceptions of LMS are very low compared to other LMS platforms (Machado & Tao, 2007; Carvalho, Areal, & Silva, 2011; Bremer & Bryant, 2005).

The students in Saeed and Sinnappan's (2011) study viewed microblogging in a positive light, encourages studies such as mine to build upon the notion of positivity. Saeed and Sinnappan (2011) stated that their study "highlights the learning patterns of today's students who prefer to have the element of enjoyment in their learning activities and are more likely to use an educational technology if it's fun or enjoyable" (p. 1118). An argument of this study was that microblogging is more enjoyable and by proximity might be a better form of communication than LMS as reported by Saeed and Sinnappan (2011).

Their results substantiate my hypothesis that there is a shift away from utilitarian aspects of distance education resources to a more dynamic, robust, and entertaining element of engagement. Today's educators have seen a shift in how student view educational technologies. Traditional educational media (textbooks, digital resources, TV, and radio) were produced to deliver content to an end user. Little attention was paid to how students would tangibly engage the material beyond passive reading, writing, and reviewing. The research by Saeed and Sinnappan (2011) found that it is time that educators move beyond measures of success, such as usefulness and ease of use, and place additional emphasis on intrinsic characteristics when considering technology adoption.

Starting in the mid-2000s, educators began to see the value of having students actively participate in the content by using games, role-playing activities, and flipped classroom strategies. One of the forerunners in this shift in educational ideology was discussed at ASCILITE 2011: 28th annual conference of the Australasian Society for

Computers in Learning in Tertiary Education. Presenters at the conference stated that intrinsic motivation (enjoyment) is a key factor in whether a student will actively engage with the educational resource. Another key finding from the conference was that prior to learners adopting technology, they place a high level of importance on the opinions of friends and family. Batrina and Treleaven (2015) summed it up well by stating that "social media data is clearly the largest, richest and most dynamic evidence base of human behavior, bringing new opportunities to understand individuals, groups and society" (p. 90).

Literature Review Summary and Filling in the Gap

Since the mid- to late 2000s, numerous studies have incorporated microblogging into distance education courses (Junco et al., 2011; Kassens-Noor, 2012; Veletsianos, 2012; Gao et al., 2012; Tang & Hew, 2017). Those studies and reviews of literature have described intriguing results from using microblogging in distance education courses. The summary of findings includes the following:

- Microblogging has shown to be an effective medium for increased student engagement and participation (Junco et al., 2012).
- Twitter's mobile access leads to improved peer-to-peer communication (Kassens-Noor, 2012).
- Microblogging is a relatively easy medium to learn and use (Gao et al., 2012).
- Microblogging is a dynamic, interactive platform for sharing information, thoughts, and opinions (Saeed & Sinnappan, 2011).

- Microblogging has the potential to create meaningful social bonds (Goa et al., 2012).
- Procedural guidelines exist for the effective implementation of microblogging into a distance education course (Kassens-Noor, 2012; Tang & Hew, 2017).
- Users expressed displeasure using traditional LMS for discussion forums (Saeed & Sinnappan, 2011).
- Microblogging has a relatively high adoption rate according to technology acceptance model (TAM) (Saeed & Sinnappan, 2011).
- A low percentage of studies report participation aversion to using Twitter, due to its supposed limitations, character requirements, privacy concerns, and increased workload (Tang & Hew, 2017).
- Microblogging encourages more communication in real-time with its instant message capability (Gao et al., 2012).

All of these points informed my study in a variety of ways. First, a significant level of evidence exists that microblogging can be used as an effective communication tool for vehicles such as discussion forums. That evidence is critical to the validity and significance of my study. Secondly, microblogging has been successfully implemented into distance education courses, and multiple studies have found microblogging to be effective in increasing key components associated with distance education (social presence and sense of community) (Munoz, Pellegrini-Lafont, & Cramer, 2014; Baisley-Nodine, Ritzaupt, & Antonenko, 2018). Thirdly, researchers (Vohra, 2020; Ye, Ying, Zhou & Wang, 2019). have provided practical guidelines or best practices on how to

incorporate microblogging into traditional discussion formats. Fourthly, given my understanding of the recent scholarship, my work intended to fill gaps in the literature by conducting research in the following areas:

- Add a mixed method redesign as stated by Tang & Hew, 2017. Tang and Hew (2017) state the majority of the literature focuses on the general use of Twitter in the classroom "fewer examined students' individual changes over time (p. 112). This study addresses this suggestion for future research by exploring students' experiences using Twitter over two different semesters. Tang and Hew (2017) mention that there was an overabundance of descriptive studies in relation to comparative investigations. This study addresses this issue by offering a comparison between two semesters and the inclusion of two different research methods.
- Include the instructors' perspective in the research (Tang & Hew, 2017). Additionally, Tang and Hew (2017) states the "need (for) more research that examines the perspectives of the course instructors' use of Twitter" (p.112). This study adds more depth to the existing body of literature by adding a mixed method approach that includes a qualitative investigation on instructors' experiences using Twitter in their courses. This study is greatly aligned with Tang and Hew's (2017) recommendation that future research should be devoted to the examination of "why some teachers who see value in using Twitter for their own learning choose not to use the microblogging tool with the students" (p.112). A

key methodological component to this research was to investigate the experiential perceptions of instructors in relation to their students.

- Investigate the influence that user interface design has on a distance education course (Metros & Hedberg, 2002). Previous scholarship states that user interface design can influence the overall user experience when interacting within educational content (Metros & Hedberg, 2002). Metros and Hedberg (2002) inform this study by demonstrating the need for educators to consider how easy it is for the user to effectively use the technology for desired outcomes. Greater difficulty could lead increase levels of frustration and thus a decrease in overall satisfaction and performance. One of the intentions of this study is to explore how the interface design of a communication platform impacts key components of distance education.
- Desire of students to "just-in-time and continuous on a mobile device" (Baisley-Nodine, 2018; p. 249). Today's college students routinely use their mobile devices to access course content. Moreover, these students desire to have the most up to date information about the content they are learning. It is incumbent upon educators to think about how mobile technology and current resources shape how participants interact with the course materials.
- Investigating the impact of microblogging on classroom community building (Vohra, 2020). Interest in the usefulness of microblogging in the classroom has grown in interest over the past decade. Information technology has increased the accessibility and speed in which data has been transmitted. Education scholars are

investigating how these digital communities are influencing the understanding and participation in classroom curricula. This research adds to the body of literature by exploring new adaptions to information technologies in the classroom and describing the shared experiences of both participants and educators from a qualitative and quantitative perspective.

CHAPTER 3

METHODOLOGY

The challenge for online educators is to attempt to re-create social interactions that occur naturally in traditional face-to-face classrooms. Many studies show that the more the online course can replicate the social components of a face-to-face course (modeling, observation, communication, social presence, sense of community), the better the experience is for both participant and educator. Key educational outcomes, such as increased participation, higher levels of learning, and more overall student social engagement, are just some of the outcomes that result from a focus on connecting online curriculums with face-to-face instruction. The goal of this research study was to explore the mediums, modes of transmission, various LMS platforms, and specific features that create or develop these social learning constructs and thus increase students' social

engagement. This research study endeavored to better understand this connection between technology and students' social engagement constructs by utilizing a mixed methods approach.

Rationale for Using a Mixed Methods Approach to Case Study Research

Rather than conducting a purely quantitative study with student participants via an online survey, I added a qualitative component, a small descriptive case study, with the instructors to add a richer understanding from the perspective of the instructor. I selected a case study methodology to accomplish this part of the study. Yin (2003) stated that three conditions are necessary to determine if a research project can be classified as a case study: (a) answering "how," "what," and "why" questions, (b) minimal control over behavioral events, and (c) a focus on contemporary events. I feel that this project qualified on all three fronts. More specifically, this research could be classified as a descriptive investigation because it accounted for participants' experiences. This research added to the preexisting literature that connected technology with key components of distance education courses (social presence, sense of community, and quality user interface) and deepened the understanding of how social media influences the way students communicate academically online.

In addition to the rationale for a case study provided by Yin (2003), Creswell (2003) stated that a case study could be a useful platform in which to collect both qualitative and quantitative data. Creswell (1999, 2003) stated that mixed method approaches "permit triangulation and complementary, overlapping examination of a

phenomena of interest, hence enhanced scope and breadth of understanding" (p. 331). One of the intents of this study is to compare and contrast how students feel with the experiences of the educators. The aim is to see if the instructor interviews inform the quantitative responses of the students. This mixed methods, descriptive case study could provide a greater level of understanding because it relates to the impact that a medium has on key components of a distance education course.

The first step in the research design process was to identify the types of data I wanted to collect and how to collect that data. After conducting a through literature review, I found two gaps in the literature that my study could address. The first was to conduct my empirical research study using a mixed methods approach. The second gap included investigating the perceptions of instructors who use those technologies in their distance education courses. An early challenge was to find a class in which I could incorporate the intervention. Due to the complex nature of the invention (Twitter) and the need for administrative approval, it was appropriate to collaborate with an instructor within my doctoral department--Organization, Information and Learning Sciences (OILS).

OILS 541--The Adult Learner

The OILS Program describes itself as a program that helps students with the skills, resources, and training needed to succeed in discipline of instructional technology, training and learning sciences. OILS 541 – The Adult Learner is a core course in the program and examines the dynamics of teaching and learning transaction within the

context of adult education. Specific attention is on adult life stage development, relevant learning theories, and learning style issues of cross-cultural populations. The overall objective of this course is to explore the teaching and learning transaction created and experienced by adults.

OILS 541 – The Adult Learner was chosen as the course for its connection to the subject matter, instructional design and technology, and for its convenience sampling opportunity. The data for this project was collected at the University of New Mexico's College of University Libraries and Learning Sciences OILS Program. The course chosen to collect and the analyze the data was OILS 541, The Adult Learner, during the 2020 summer session and fall semester.

There were three reasons for choosing this particular course. First, I chose this program and this particular because it provided the opportunity to investigate the phenomenon at a conceptual level. The OILS curriculum has a variety of distance education courses and its focus on instructional technology and training provides an opportunity in which to explore the influence of new media in a higher education environment. Second, being a doctoral candidate in the OILS program afforded me the opportunity to connect with faculty members and administrative personnel. These contacts were instrumental in granting me access to curriculum, instructors of record, and integration of research protocols. Without the assistance of these individuals, I would have been unable, without significant effort, to secure access to another distance education course. Third, the course itself is about the pedagogy for adult learning. Students should be able to clearly connect the learning objectives of the course with the

aims and objectives of this research study. A major portion of the curriculum is devoted to the influence technology can have on adult teaching and learning. These two factors made this course a good fit for my study.

Research Design: LMS (Summer 2020)

The summer section of OILS 541 used LMS as their mode of delivery. Students enrolled in the summer 2020 session used LMS built-in discussion forum. The main purpose of those online discussion forums was to have students share and discuss ideas pertaining to the course material, such as assigned readings, videos, and research articles. All materials were related to the process associated with adult learning. The two required textbooks were *How learning works: Seven research-based principles for smart teaching*. S.A. Ambrose, M.W. Bridges, M. DiPietro, M.C. Lovett, and M. K. Norman (2010), and *Adult Learning: Linking Theory and Practice.* S. B. Merriam and L. Bierema, L. (2013).

The first step in the research design process was to communicate the proposed incorporation process with the instructor of record for the summer of 2020. I spoke with the instructor of record in a series of emails and phone calls approximately three weeks prior to the start of the summer 2020 session. During our first meeting, I presented a comprehensive overview of my research project and how it might successfully be integrated within the course. I cited some of the considerations needed for IRB approval. Subsequent meetings were dedicated to discussing the potential impact that this invention (survey) might have on the curriculum and on the students. Once we concluded that the

survey's influence would be minimal, the instructor and I discussed how best to incorporate the survey into the course.

For the summer 2020 session, all students were placed in one of two discussion forum groups. It was the intention of the instructor of record to encourage more substitutive interaction by limiting the number of participants in smaller groups that might be more intimate. Additionally, this separation allowed students to engage with one another in a more dynamic environment. One group discussed one topic while the other group shared their thoughts on another. Students were asked to complete a 5R (Read-Reflect-Research-Relate-Resources) assignment each week. The 5R assignments were meant to develop the student's ability to effectively read relevant research, write out their initial reactions (reflection), research how the literature informs their positionality, relate their research-driven perspectives to other relevant contexts, and provide additional resources for the reader to utilize in formulating their own opinions. An example of this 5R assignment would be the following:

- Read -–Klein, J. D., & Kelly, W. Q. (2018). Competencies for instructional designers: A view from employers. *Performance Improvement Quarterly*, *31*(3), 225-247.
- Reflect – Write a 200 – 300-word summary of this article and include how your perspective on instructional design may have changed
- Research – Find two more peer-reviewed articles that further the discussion on instructional design in the workplace

- Relate – Find two present-day scenarios were Klein, J. D., & Kelly, W. Q. (2018). Competencies for instructional designers: A view from employers. *Performance Improvement Quarterly*, *31*(3), 225-247 would be beneficial
- Resource – Find two platforms, theories, software that connect the research with future workplace solutions

The intention of the 5R assignment was for students to reflect and share their thoughts on the week's material. 5R essays were submitted as an assignment for instructor grading. Instructor feedback was given via a grading rubric for this asynchronous discussion. Each group member commented on at least three members' posts, and vice versa, with follow-up responses by the original writers. These 5R assignments were uploaded to the discussion forum by Saturday night of each week. Comments on at least three peer's posts were expected by Tuesday of the following week, and responses to comments provided on each student's post were expected by Thursday of that week.

Summer 2020 students were expected to respond to everyone who commented on their post. This requirement gave students the opportunity to reflect on the thoughts of others in such a way that they could re-evaluate their own perspective on the topic and respond to questions raised by their classmates. The requirements for commenting were intended to allow the most freedom of expression, while still offering some direction. The three assessed comment elements (feedback, lesson learned, and questions) were intended

to encourage peer evaluation, reflection, and reaction, respectively. The instructor of record felt it was critical that students' comments reflect their background knowledge of the writer's topic based on required reading and creating an introductory video for that topic.

The experimental design for Summer 2020 was to use LMS for discussion and interaction and Dropbox for posting their student work. The Fall 2020 semester would use microblogging for discussion and interaction and LMS for students to submit their work. The rationale for that decision was that students using LMS were able to use LMS for their attachments, posts, and replies. Students using microblogging were unable to include their reflection paper as an attachment. Students were instructed to sign up for a free Dropbox Basic account. Students then were asked to post their papers using this naming convention: Group Lastname_M (module #). Students then would read their classmates' 5R assignments and add the same convention above with their last name at the end. Here is an example of this exchange:

Group_Last name (of colleague to create original post) _M (module #) _Last name (the writer of the comment) ex. Group1_Doe_M1_Smith

To review, students were asked to create a type of summary (5R paper) and post these assignments in two places: assignments tab (for instructor to grade) and Dropbox (for your colleagues to access). The instructor suggested that students have one browser window open with the Dropbox folder and another window open with LMS discussions.

From this set-up, students could read a paper from Dropbox and then post comments and questions into the discussion thread.

The role of the instructor in the discussion forum was to facilitate and grade the dialogue between students by offering words of praise, guidance for improvement, and encouragement to continue their engagement. A detailed grading rubric was sent to the students prior to and throughout the semester explaining the expectations for participation in discussion forums (depth of replies, word requirements, quick turn-around time for replies). The instructor of record then graded the discussion forum as per the grading rubric set forth in the syllabus. Examples of useful and not-so-useful evaluation comments were provided to the students. Those examples provided clear direction as to what equated to Improvement Expected (0-1 point), Marginally Acceptable (3-5 points), and Proficient (6-7 points). Specific criteria were provided to each participant for each category. It was expected that students would add value to the discussion by writing substantive content in an attempt to create a more meaningful dialogue. Ways in which students could achieve this goal would be to state why they agreed or disagreed, present a different perspective, or suggest practical application of the material. Points or grades were given based on the instructor's discretion of how well the students achieved the criteria cited above.

Incoming UNM students are taught to use LMS as a part of their new-student orientation. It is hoped that the training would enable UNM students to sufficiently use LMS for online classes. It was an assumption of this study that students' prior experience,

preparation, and familiarity with LMS would result in a lower degree of training compared to lessons to learn Twitter. Students were told they could contact IT support, UNM Center for Distance Education and/or the instructor of record if specific guidance was needed to complete discussion board tasks via LMS.

Research Design: (Fall 2020)

The research of Dunlap and Lowenthal (2009) enlightened my work by giving future researchers specific strategies to effectively incorporate microblogging into a distance education course. Dunlap and Lowenthal's research (2009) offer guidelines for instructors using microblogging with students. This five-step process served as a checklist I shared with the fall 2020 instructor of record. Many of the pre-semester discussions between myself and the instructor of record, centered around how to achieve these five points:

- Establish relevance for students.
- Define clear expectations for participation.
- Model effective microblogging use.
- Build Twitter-derived results into assessments.
- Continue to actively participate in Twitter.

A similar communicative process was applied during the second eight-week session of the fall 2020 semester, with the exception that students were asked to communicate using microblogging instead of LMS. The same expectations and guidelines were applied (content, timing, frequency, and replies) to posting on

microblogging as they were for LMS. I set up multiple meetings with the instructor of record during the summer of 2020 in preparation for the fall of 2020.

Like the conversations I had with the instructor of record for the summer of 2020, myself, and the instructor of record for the fall of 2020 discussed potential challenges that might arise integrating microblogging into the curriculum. Topics we discussed included the potential impact (both positive and negative) students might experience using microblogging instead of using a familiar software program such as LMS. We also considered the potential technical challenges associated with using social media to create a discussion forum environment. Some of the issues we examined were creating unique hashtags, students using fictitious accounts with nonidentifiable information or "burner" accounts, and the degrees of social media illiteracy expressed by students. Another important topic we reviewed was how to address student concerns over privacy, confidentiality, and the opportunity for others not enrolled in the course to contribute.

The instructor and I decided that the best way to address these concerns was to create a folder of resources that students could use as a frequently-asked-questions guide. This folder contained a series of video tutorials, Twitter-specific websites, and step-by-step materials that demonstrated how to effectively communicate via Twitter. The purpose of those resources was to give students who are not familiar with this social media a step-by-step procedure on how to create an account, write a tweet, reply to others' tweets, add pictures, and include outside references. Students had access to this folder by the first week of class, and it remained open throughout the semester. The importance of student familiarity with microblogging cannot be understated. As such, the

first two weeks of the semester were devoted to training students to use microblogging for their discussion forums.

During the first week of the semester, I created and sent an email to the fall 2020 semester students, that established the relevancy associated with communicating on Twitter. The purpose of this email was to demonstrate the benefits of microblogging and to ease some of the concerns that may have had. Additionally, this email demonstrated the preparation that went into incorporating this project into the curriculum. Further, basic functionality, features, and use of microblogging were described in detail to the students. One of the main topics discussed was how to use a unique hashtag when communicating in a discussion forum-like environment.

In this scenario, the instructor of record created a unique group or microblogging #hashtag. This #hashtag allowed students to communicate with one another in a similar contained manner such as LMS. For example, students could post their “tweet” and reply to others by using the #OILS541Fall2020. This would result in the posting or tweet being conjoined with this unique hashtag. Other users of microblogging could participate in the discussion by using the same #hashtag. This potential for outside influence was made known to students in advance. Certain measures were put into place to ensure that online misbehavior (bullying, trolling, and ghosting) would be minimized.

The instructor of record stated in the syllabus the manner of communicative behavior acceptable on the use of microblogging. The instructor notified students of the communication policy prior to the start of the semester and informed the students that

they could be penalized for behavior that was not conjugant with the expectations set forth in the syllabus. The instructor had the ability to block outside users from interfering with the discussion.

I was fortunate to work with an instructor who was an avid microblogging user and routinely tweeted weekly about personal and academic matters. Her knowledge and use of microblogging exceeded my expectations. However, my research project was the first time she incorporated microblogging into her distance education course. Given this advantageous position, I dedicated more thought to execution rather than to basic functionality. I decided that there were five key areas to address when incorporating microblogging into a distance education course.

Research Hypothesis

Students will experience a higher degree of social presence, sense of community, and an increase of satisfaction regarding the user-interface design using microblogging than that of LMS for both the summer session and the fall semester.

Population and Sample

The convenience sample for this study was two classes taught at the University of New Mexico by way of the College of University Libraries and its Organization,

Information, and Learning Sciences program. The class size, demographics and assessment expectation for both courses will be similar. It was the intention of this study to have both courses as similar as possible for consistency and reliability purposes. Both courses had approximately 20 students, all of whom were graduate students with most considered nontraditional students (students over the age of 18-28). OILS 541 is a required course to achieve a graduate degree from the Organization, Information and Learning Sciences discipline. The professor for the summer 2020 is as Professor X and fall 2020 is Professor Y. This sample covered two eight-week sessions, one in the summer and one in fall of 2020. Both sessions were the based on the same course OILS 541, the Adult Learner. This group of participants were classified as a convenient sample due to the pre-existent relationship. I anticipated that the total number of student participants would be sufficient to conduct a minimal but statistically significant quantitative analysis. Additionally, I conducted semi structured interviews with each course's instructor of record. Due to COVID-19 concerns, the interviews were held and recorded over an online Zoom meeting.

One method of ensuring qualitative quality is to conduct a member check with those that are interviewed. Birt, Scott, Cavers, Campbell, and Walter (2016) report that member checking (sending the transcription to the interviewee) can enhance trustworthiness and in some cases increase validation. This additional step helps researchers see if their analysis fits the overall narrative and theme of the interviewee. My member checking process included two stages. First, I restated or summarized the statements made by the interviewee to check for accuracy and understanding. Secondly, I

sent each interviewee a copy of my transcription that includes how I coded, wrote memos, and analyzed the data.

Quantitative Methodology

Students were asked to complete a survey during the last two weeks of the summer and fall sessions, addressing their experiences using LMS and Twitter. The survey was created using a Survey Monkey design and included constructs from adapted versions of three well-established and previous tested survey instruments. Below is a list of frameworks and instruments used for data collection:

1. The Community of Inquiry (CoI) Model and CoI framework Garrison et al., 2001) to assess the students' social presence,

2. Rovai's (2002) classroom community scale (CCS) to measure the students' sense of community.

3. Cho, Cheng, and Lai (2009), to assess the overall functionality and design of an LMS. (The adapted survey instrument is in Appendix A.)

Concerns over validity and reliability were addressed by using instruments that were validated by prior scholarship and the removal of unreliable or invalid measure nor applicable to the context of this study. Some of the measures that were removed included removing cognitive presence for CoI, "learning" scale items from CCS, and perceived system support for Cho, Cheng, and Lai (2009).

Quantitative Research Questions

- Is there a difference in social presence between LMS and microblogging in a distance education course?
- Is there a difference in sense of community between LMS and microblogging in a distance education course?
- Are there any differences in students' perception of user-interface design, functionality, usefulness, and ease of use between LMS and microblogging in a distance education course?

Independent and Dependent Variables

The identification of the independent and dependent variables is important as I conduct and analyzes quantitative data. Below is a list of independent and dependent variables.

Independent variables: Communication Platforms, OILS 541 Course (Summer session and fall semester 2020)

Dependent variables: social presence, sense of community, user-interface design.

Subconstructs: Affective expression, open communication, group cohesion, connectedness, perceived user-interface design, perceived functionality, perceived usefulness, perceived ease of use,

Validity and Reliability of Instrumentations

Presenting the validity and reliability of an instrument is an important aspect in reporting my findings. Part of the rationale for choosing these particular instruments were their high values of validity and reliability.

- CoI (Garrison et al., 2001) to assess the students' social presence – Stewart (2019) study on incorporating the CoI survey for online writing courses concludes

  "An analysis of internal consistency confirms that the survey items reliably measure the three constructs of the CoI Framework. In the original CoI Survey research, J.B. Arbaugh et al. (2008) reported internal consistencies equal to 0.95 for cognitive presence, 0.91 for social presence, and 0.94 for teaching presence. In the current study, the Cronbach alpha coefficient for each presence was: cognitive presence = 0.91, social presence = 0.84, teaching presence = 0.94. (p. 43).

- Rovai's (2002) classroom community scale (CCS) to measure the students' sense of community. Ahmady, Kohan, Bagherzadeh, Rakshhani, & Shahabi, (2018) used the CCS in their cross-sectional study and conclude that the CCS: "is a valuable assessment tool that can be used for various purposes: (1) to measure SCC in online learning; (2) to measure the efficacy of courses designed to promote online classroom community; (3) to reduce feelings of isolation experienced in online learning, (4) to create classroom and school environments that promote community

learning, and (5) to enhance student satisfaction, learning, and persistence in virtual environments. (p. 259)

- Cho, Cheng, and Lai (2009), to assess the overall functionality and design of an LMS. Cho, Cheng and Lai (2009) state: "As the Cronbach's alpha values of all the constructs, with a minor exception of PSS, were over 0.7, it can be claimed that all of the variables are reliable. Moreover, as all of the measures of the constructs have been used in past studies and the questionnaire was validated by experts in the fields of IT and behavioral science before it was distributed, the content validity of all the constructs can be deemed to be acceptable. (p. 221).

Social Presence: *Community of Inquiry (CoI) Survey* (Garrison, Anderson, & Archer, 1999)

One of the most popular and cited instruments used to study social presence is the CoI survey created by Garrison, Anderson, and Archer (1999). Oztok and Brett (2011) stated that CoI "is likely the most influential theoretical framework to date for studying social presence in online learning communities" (p.13). Garrison et al. (1999) defined social presence as "the ability of participants in a community of inquiry to project themselves socially and emotionally . . . through the medium of communication being used" (p. 94). Garrison et al.'s (1999) definition of social presence helped inform this study to differentiate the process of creating civic connectivity (collaborative community) from basic interaction (simple process of downloading information).

Not only has CoI been identified as a significant instrument in which to study the phenomenon of social presence, but it can be used to connect social presence to various distance education environments. That was a critical aspect to my study owing to CoI's adaptability to traditional LMS and the expansion into social media (Twitter). CoI use afforded this study the opportunity to collect meaningful empirical data in a fixed number of survey items. Oztok and Brett (2011) reported that "CoI is particularly important since it provides a model to systematically investigate social presence and its relation to other elements in online learning" (p. 13). That statement was a key reason I used this instrument. I explored the impact of the mediums (LMS and Twitter) on various interactions. The significance of this instrument cannot be overstated. This model has been used for empirical research and has been applied to multiple facets in online learning (Arbaugh, Cleveland-Innes, Diaz, Garrison, Ice, Richardson, Shea, & Swan, 2008; Rourke & Kanuka, 2009; Shea & Bidjerano, 2009).

Bangert (2009) studied undergraduate and graduate-level courses (online and blended) using exploratory (EFA) and confirmatory factor analysis (CFA). Bangert (2009) reported Cronbach's alpha was .91 for social presence and had a subtest mean of 4.53 (SD = 0.93). Bangert (2009) conducted a confirmatory factor analysis after the exploratory factor analysis was completed. Bangert (2009) states that "Exploratory factor analysis was conducted with the first subgroups to determine if the underlying dimensions of the CoI survey were consistent with the proposed elements of the CoI model." (p. 107).

This rationale is an important consideration for this study because it details how other scholars investigated the communicative dynamics of graduate students in online course. Additionally, Bangert (2009) then applied CFA "to test the fit of the hypothesized model against the model predicted to exist in the population" (p. 110). The end result of the CFA was a RMSEA of .069 "indicative of a "reasonable fit" according to the criteria established by Brown and Cudeck" (p. 108). Bangert's (2009) work offers a quantitative perspective on sense of community. Bangert (2009) concluded by stating the "CoI survey as an instrument for assessing the influences of teaching, social and cognitive presence on the students' perceptions of the quality of their online learning experiences" (p.110).

The best summation of how well this model fits my own work, was stated by Oztok and Brett (2011). Oztok and Brett (2011) state that "The Community of Inquiry (CoI) is likely the most influential theoretical framework to date for studying social presence in online learning communities" (p. 5). Oztok and Brett (2011) make this claim based on the way CoI's ability "to empirically test the concept on relation to other dynamics in online learning" (p. 6). The variables where CoI has been used for analysis include students' perceptions of social communication, cognitive presence of participants, figurative language, and group-based learning activities. Moreover, Oztok and Brett (2011) state CoI's effectiveness as a tool to examine "the relationship between social presence and students' online behaviors" (p. 6). All of these points led Oztok and Brett (2011) to state that "many online learning researchers, particularly those studying higher education contexts, find the CoI model particularly relevant" (p. 14). Additionally, Arbaugh et al. (2008) reported that the CoI model is particularly useful because it

provides “the methodological guidelines for measuring each of the presences that constituted a community of inquiry” (p. 134).

Another seminal work associated with applying the CoI framework is that of Shea and Bidjerano (2009). Shea and Bidjerano’s (2009) sample consisted of 2,159 participants “in a multi-institutional fully online learning network” (p. 547). Shea and Bidjerano (2009) reported a Cronbach alpha of .92 for the social presence subscale. In addition to factor analysis. Overall, Shea and Bidjerano (2009) validated the CoI framework in assessing teaching, social, and cognitive presence. Shea and Bidjerano (2009) concluded that the “results indicate that the survey items cohere into interpretable factors that represent the intended constructs” (p. 543).

Sense of Community: *Classroom Community Scale* (CCS) (Rovai, 2002)

Additionally, I used Rovai’s (2002) CCS to study the sense of community felt by participants in a distance education course. Rovai (2002) defined sense of community as a degree of “connectedness [that] represents the feelings of the community of students regarding their connectedness, cohesion, spirit, trust, and interdependence” (p. 206). Rovai’s (2002) model is regarded as one of the most significant contributions to the distance education discipline regarding the investigation into what constitutes a “sense of community” (Lear, Ansorge, & Steckelberg, 2010; Shackelford & Maxwell, 2012). Multiple disciplines have utilized CCS to determine the overall sense of community of their distance education courses (Barczyk & Duncan, 2013; Barnard-Brak & Shiu, 2010). Additionally, Rovai (2002) presented a correlation matrix for the CCS that indeed

revealed a strong relationship between items. Rovai (2002) reported the Cronbach's coefficient of .93 (CCS), .92 (connectedness subscale) and .87 (learning subscale). These results indicate a good to excellent reliability score for each of the scales and the instrument.

Lear et al. (2010) used the CCS instrument to study interactions in 30 online classes. Lear et al. (2010) reported that "interactivity was significant to building community ($r = 0.61$, $p < .01$)" (p. 71) and that a "significant correlation existed between the student's perception of sense of community and learner engagement ($r = 0.557$, $p < 0.01$)" (p. 76). Lear et al. (2010) study strengthens the argument that participant interactivity, the exchange of information through relational transmission, can positively influence key components (sense of community and learner engagement) of what many distance education scholars consider an effective instructional design. Shackelford and Maxwell (2012) used the CCS instrument to study student perceptions of their interactivity in online courses. The sample size in Shackelford and Maxwell's (2012) research was 381 online surveys. Shackelford and Maxwell's (2012) reliability analysis showed a Cronbach's alpha of .928 for the CCS scale. The results of Shackelford and Maxwell's research (2012) shows that interactions between learners is the greatest contributor to students' sense of community. Schakelford and Maxwell (2012) informs my study because it gives credibility to the argument that the depth and frequency of student communication/interactions can lead to an increase sense of community and thus a better overall experience in a distance education course.

One of the most recent and comprehensive uses of the CCS was published by Ahmady, Kohan, Bagherzadeh, Rakshani, and Shahabi (2018). Ahmady et al. (2018) surveyed 215 postgraduate students to assess their perception of community in medical distance education courses. Ahmady et al. (2018) stated that the CCS is an effective assessment tool to measure a variety of key elements associated with an effective distance education course: sense of community, efficacy, reduction of isolation, community learning, student satisfaction learning, and persistence. Ahmady et al. (2018) reported a Cronbach alpha of 0.87 for the CCS, 0.86 for connectedness, and .085 for learning. Ahmady et al. (2018) reported that "the CCS scale also showed excellent test-retest reliability" and that testing "indicated that internal consistency and ICC were outstanding for the total scale and the subscales" (p. 258). Ahmady et al. (2018) state the following test-retest analysis: "intra-class correlation coefficients (ICCs) were calculated to establish the test–retest reliability of the CCS over an interval of 2 weeks [38]. Cronbach's alpha value of 0.7 or greater [26] and ICC of 0.4 or greater [25] were considered acceptable [38]." (p. 257).

Ahmady et al. (2018) found that a confirmatory factor analysis (CFA) showed that the CCS proved to be a valid and reliable scale within the terms of a model and regarding its two subscales: connectedness and learning. Ahmady et al.'s (2018) study further demonstrates the strength of validity and high level of reliability of CCS to measure a sense of community.

User Interface Design: *Perceived User-Interface Design* (PUID) (Cho, Cheng, & Lai, 2009)

Lastly, I incorporated the survey instrument created by Cho, Cheng, and Lai (2009) to assess the perceived user-interface design (PUID) for LMS and Twitter. The rationale for choosing this instrument was three-fold. First, the PUID instrument asks a series of specific questions that explore how the e-learning tool (LMS or Twitter) influenced a student's perception of overall design, functionality, usefulness, and ease of use. It is a belief of this study that each one of the four components influenced the level of students' social engagement in an online course. Cho et al. (2009) reported "the Cronbach's alpha values of all the constructs, with a minor exception of PSS, were over 0.7, it can be claimed that all of the variables are reliable" (p. 221). Herr (2012) used this instrument with similar results. Moreover, Cho et al. (2009) has influenced the educational and commuter research disciplines as this scholarship has been cited by numerous studies in a diverse field of inquiry (Motaghian, Hassanzadeh, & Moghadam, 2013; Sørebø, Halvari, Gulli, & Kristiansen, 2009; Roca & Gagné, 2008; Šumak, Heričko, & Pušnik, 2011). It was the intent of this project to contribute to the body of literature connecting the acceptance of e-learning technology with elements of students' social engagement and perceptions of quality for distance education courses.

Qualitative Methodology

In addition to the quantitative portion of the project, I asked a series of semi-structured interview questions to each instructor of record during the last week of the semester. The rationale for this time frame was to capture their experiences while still fresh in their minds. The purpose of this endeavor was to explore the experiences of the instructor and compare them to those of the students. This mixed method approach could

enrich my research by adding a different perspective on the influence of LMS or microblogging on students' social engagement.

Qualitative Research Question and Sub-questions:

RQ1: How do LMS and microblogging influence students' participation in an online learning environment?

SBRQ1: What aspects of LMS and microblogging influence students' participation in an online learning environment?

SBRQ2: How do instructors use LMS and microblogging as a resource to promote personal bonds (social presence) among students?

SBRQ3: How do instructors use LMS and microblogging as a resource to build a communal connection (sense of community) among students?

IRB Considerations

I achieved full IRB approval to conduct this research project for the summer session and fall 2020 semester.

Benefits of the Research

There will be no benefit to students from participating in this research other than that of points achieved as per the syllabus for participation in the discussion forums. However, it is hoped that information provided by the students (via the adapted survey instrument) and instructors (via semi structured interview) will inform researchers, educators, and administrators about the influence that LMS or social media has on several

key components--social presence, sense of community, and user-interface design on distance education courses.

Risks of the Research:

- Disclosing academic pursuits on a social media platform.
- Experiencing feelings of anger, disappointment, resentment, or sadness due to the replies of other classmates.
- Discouraging tweets from those outside the course (those using their personal microblogging account).
- Expressing opinions in a more public forum (Twitter) versus private forum (LMS).
- Creating a new social media account for academic purposes.
- Instructors expressing their feelings and experiences using an LMS or platform.
- Interviews with instructors will be published in a dissertation and stored in UNM's repository.
- Interviews will be conducted either face to face or electronically; in both instances the interviewer will use a computer to record the interaction. The data from these interactions will be stored in the interviewer's personal, password-protected computer.

The research team helped to minimize these risks by doing the following:

- Fully disclosing the associated risks with the participants.

- Asking participants to consider creating separate, anonymous accounts, or "burner" accounts.
- Vetting the privacy, confidentiality, and security of the research design with well respected, experienced, tenure-track faculty members.
- Prompting de-identification of data.
- Controlling access of the data only to myself and to specific committee members.
- Safeguarding the data collection process through the active release and closure of discussion forums.
- Conducting the instructor interviews in a private, secure room in Zimmerman Library or via a password-protected Zoom meeting.
- Recording the interview on a personal, password-protected computer.
- Transcription by student researcher of the interviews.
- Storing recordings directly on the personal, password-protected computer instead of on the cloud.

Data Management Procedures and Confidentiality

Data from LMS was kept privately and securely via LMS's internal servers. Additionally, security measures were addressed by a UNM privacy and confidentiality agreement. Communication among students while in LMS was restricted to those granted access to the course. Student exchanges via microblogging were subject to Twitter's user agreement policy. Communication among students while using microblogging could be

viewed and responded to by others who were not granted access to take part in the course. Access to the data was limited to five key people-Gavin Leach, student investigator; Dr. Tracy Hart and Dr. Stephanie Moore, instructors of record; Dr. Victor Law, data analytics lead; and Dr. Frances Wilkinson, principal investigator. Data transfer was handled via UNM's secure email service. Initial survey data was gained from a Survey Monkey request. All survey data was converted to an Excel spreadsheet for further analysis. Electronic records were stored on a password-protected or encrypted computer as appropriate, based on the sensitivity of the data. Identifiers were stored separately from project data. For identifiable data, a coding process was used to store data without identifiers, with the link stored separately from all other project records. Portable devices and student investigator Gavin Leach's laptop were password protected and kept at a secured, locked location at his place of residence when not in his possession.

Interview Procedure and Protocol

The bulk of qualitative data collection and analysis was generated in the summer and fall of 2020 by conducting two semi structured interviews with both instructors of record. The interviews were conducted online during a password-protected Zoom meeting. The instructor had the ability to blackout their screens if the participants preferred their faces not be visible during the recording. The interviews were audio-recorded on my computer and were stored on a personal, password-protected computer. An additional recording device was available to use in case of a technical malfunction. I asked the participants if they felt comfortable with me taking notes while the interviewees answered questions. I included those personal notes in my analysis. I did not

ask for the names of the instructors because their identities were kept anonymous. The recordings were destroyed upon completion of the research project. These interviews were transcribed by me applying Microsoft Word and its Voice/Dictate feature. The rationale for choosing this procedure was to gain a personal experience of transcribing interviews, utilizing a reliable dictation technology, and employing coding techniques directly onto the transcription (Saldana, 2016). They were kept in the same manner (personal, password-protected computer) as the interview recordings. The name of the instructors was not included in audio interviews or subsequent transcriptions. The instructors of record were identified only as Professor X (summer 2020) and Instructor Y (fall 2020).

Consent Procedure

Students were sent informed-consent notification via email by the instructor of record on my behalf, and those memos detailed the research project, aims, risks, benefits, and expectations. The email was sent two weeks prior to the survey and three weeks before the semester ended. Two subsequent emails were sent out eliciting participation. Signatures on consent forms were obtained electronically by providing a signature line in both Word and PDF formats. Additionally, participants had the option of stating in writing via email their willingness to participate or not participate.

Participants had an opportunity to opt out of the project at any time during the semester. To do this, they were invited to contact me via email at gleach@unm.edu. Any concerns over coercion or undue influence could be addressed at the beginning of the

semester by stating that participation in this project is voluntary. Additionally, the tasks that students would be asked to complete (communicating in a discussion forum) were similar to tasks required in traditional online courses. This consent form was the official document provided by UNM's IRB office. The individuals who would be authorized to ask for consent or permission to participate in this study would be me, Gavin Leach, and the instructors of record, Professor X (summer 2020) and Professor Y (fall 2020).

For interviews with the instructors, I obtained informed consent using UNM official forms during the last week of the summer and fall 2020 sessions. Instructors were informed of the content process via email and telephone. Two subsequent, reminder emails were sent out to elicit participation. Both instructors were briefed and expressed their willingness to participate in this research project as of May 1, 2020. Both instructors gave verbal consent to participate in the project.

Instructors also had an opportunity to opt out of the project at any time during the semester by emailing me (gleach@unm.edu) to express concerns. Any concerns over coercion or undue influence would be addressed at the beginning of the semester by stating that participation in this project was voluntary and temporary (semester in length). I was the only participant in the research project authorized to ask instructors for consent or permission to participate in this study. I asked for formal, written consent prior to engaging in the interview process. Consent forms also were stored electronically on this same password-protected computer.

Positionality

I have been a distance education instructor at both the University of New Mexico and Central New Mexico Community College. I have personal experience working with multiple LMS platforms such as WebCt, Moodle, and LMS. I have enjoyed my time as an online instructor and desire to become the best instructor I can. One of the ways to accomplish that goal is to explore the platforms and mediums that are the most effective in creating an environment conducive for meaningful student dialogue.

My experience using LMS has been mixed. While some students like to communicate via LMS, most find that LMS's discussion forums are busy work, an unnecessary assignment with little meaning or application. This uneven experience has contributed to my desire to explore other mediums for discussion forums.

I have noticed a desire for additional distance education courses from both a student and administrative perspective. I understand what it means to create, develop, and foster a participatory environment for students to communicate with each other and their instructor. One of my biases is that I have found discussion forums embedded in traditional LMSs to be lacking in effectiveness in creating meaningful dialogue between and among the two parties. Given this predisposition, I want to better understand the influence that traditional LMS, and modern social media (Twitter) have on key dimensions of distance education curriculum (social presence and sense of community). Additionally, I want to explore the influence that the overall user interface design has on student participation. My hope is that this mixed method study will demonstrate the value of comparing instructor and student perspective when using traditional LMS or microblogging for their distance education course.

Review of Quantitative Methods

Research Question	**Study Design**	**Variable**	**Data Analysis**
1. Is there a difference in social presence between Blackboard and Twitter in a distance education course?	Correlational Design	IV1: Blackboard IV2: Twitter DV1: Social Presence	Nonparametric Statistics Mann-Whitney Test

2. Is there a difference in sense of community between Blackboard and Twitter in a distance education course?	Correlational Design	IV1: Blackboard IV2: Twitter DV1: Sense of community	Nonparametric Statistics Mann-Whitney Test
3. . Are there any differences in students' perception of user-interface design, functionality, usefulness, and ease of use between Blackboard and Twitter in a distance education course?	Correlational Design	IV1: Blackboard IV2: Twitter DV: User -interface design, DV: functionality, DV: usefulness, DV: ease of use	Nonparametric Statistics Mann-Whitney Test

The sample size for this study was below twenty for both the summer session and fall 2020 semester. This small sample size prevented me from conducting a parametric test. Thus, I chose the Mann-Whitney Test (non-parametric test) for my data analysis to test the variance between two samples whose origin draws from the same population. The purpose of the Mann-Whitney Test is to compare differences (if any) between the dependent variable for two independent but similar groups. Additionally, the Mann-Whitney Test is an option for when the data is ordinal in nature or if t-test standards are not met. I will display the results of the Mann-Whitney Test to show if there is a

difference in the dependent variable for the two independent groups (fall vs. summer sessions).

The first step in my quantitative analysis process was to convert the paper forms of CoI, CCS, and PUID into a Survey Monkey digital format. This conversation helped to increase participation by means of increased convenience and notification (via email, LMS, or Twitter). Digitizing the survey enabled me to conduct my analysis from an Excel spread sheet, thus eliminating manual data entry errors. My quantitative analysis was conducted by mans of non-parametric statistical testing. The rationale for using was due to the small sample size and the likelihood of an irregular or nonnormal distribution. These factors prevented this study to meet the required assumptions for other, more dynamic forms of analysis.

I added demographic questions to the survey instrument: age, gender, ethnicity, and year of school. That data might prove useful for additional analysis by investing possible relationships between key constructs and demographic information. I maintained consistency between applying Rovai's (2002) Likert scale (strongly agree [SA], agree [A], neutral [N], disagree [D], strongly disagree [SD]) to the instrument as a whole.

This survey instrument included elements associated with social presence, sense of community and user-interface design. The data was generated over two semesters (Summer and Fall 2020) using two different sections of the same course; OILS 541 – The Adult Learner. Students were asked to complete a survey upon completion of the semester via Survey Monkey for the quantitative portion of the study. Both instructors

were asked to complete a semi-structured interview via Zoom upon completion of their respective semesters.

The first set of results included descriptive statistics that addressed the measures of central tendency. This data illustrated a basic overview of the participants' perceptions of social presence (CoI), sense of community (CCS), and platform design (PUID). After presenting these foundational statistics, I ran a series of correlation tests. Additionally, I assessed the reliability and internal consistency of CoI, CCS, and PUID by using Cronbach alpha measures. Lastly, I conducted independent t-tests to determine if there was a significant difference between the LMS and microblogging classes. The null hypothesis would show no difference between microblogging and LMS for assessing a student's sense of community and social presence. Below is summary of my overall study design, the independent and dependent variables, data analysis, instrumentation and the source of the data. Table 1: Quantitative Analysis Overview provides a snapshot of my approach to the quantitative portion of this study.

Approach to Qualitative Data Analysis

Qualitative standards of quality focus on the concepts of authenticity and trustworthiness (Creswell & Poth, 2013). There are many ways in which a qualitative scholar can approach these terms including through comparative coding, member checks,

triangulation, iterative questioning, etc. (Merriam, 2002; Chi, 1997; Creswell, Hanson, Clark & Morales, 2007; Mason, 2017; Shenton, 2004).

I chose case study methodology to address my research questions. My research aim was to provide a thick, rich description of the individual experiences (both instructors and students) associated with participation in an online course with an emphasis placed on social presence, sense of community and user-interface design. Saldana (2016) provides a comprehensive approach to conducting qualitative, case study research and his guidance on how to conduct data analysis using first and second cycle coding is particularly important to ensure confirmability and dependability; key components of quality for qualitative research (Whittemore, Case & Mandle, 2001).

I chose Saldana (2016) to conduct my qualitative data analysis coding for three reasons. First, I have a familiarity with using Saldana (2016) on various qualitative projects in my doctoral program at the University of New Mexico. Secondly, Saldana's (2016) work provides many practical examples, definitions and approaches to qualitative analysis. Thirdly, Saldana provides a full prescriptive description describing first and second cycle coding, analysis of interview transcripts and analytic recommendations.

According to Saldana (2016), the first step in the process is to determine what type of coding methods are appropriate for your study. Saldana (2016) defines a code as "a researcher-generated word or short phase that symbolically assigns a summative, salient, essence capturing, and/or evocative attribute for a portion of language based on visual date" (p. 292). This definition provides a clear understanding, and form of guidance, as to how qualitative scholars should identify the overarching meaning,

thematic elements, and categories of an individual(s) spoken word. My approach to this used Saldana's (2016) In Vivo and Values first cycle coding, and Pattern second cycle coding. My choice for using this coding was in review of Saldana's (2016) list of coding options and confirmed prior to conducting my data analysis.

Saldana (2016) states that "In Vivo Coding is appropriate for virtually all qualitative students, but particularly for beginning qualitative researchers learning how to code data" (p. 106). Saldana (2016) reports that In Vivo Coding is particularly effective for "studies that prioritize and honor the participant's voice" and is "quite applicate to action and practitioner research" (p. 106). In Vivo coding is useful "to ground the analysis in their [interviewees] perspectives" (p. 71). I felt that it was important to keep the essence of what was said by the two instructors that I interviewed. I was very mindful not to insert my own biases into their comments, opinions, and perspectives. As such, I followed Saldana's (2016) guidelines to "use the direct language of participants as codes rather than research-generated words and phrases" (p. 71).

I understand that there is an inherent subjectivity to qualitative research as the researcher themselves are the ones who identify these significant words or phrases. However, many scholars argue that the In Vivo approach is the most aligned with the true meaning of an individual's communication. This alignment was important to honor given the research design and mixed method methodology. I transcribed the interview with a particular care and consideration as to not alter the essence or voice of the two interviewees. I was mindful of words, phrases or statements that were repeated numerous times and salient to me; "impacting nouns, action-oriented verbs, evocative vocabulary,

clever or ironic phrases, similes and metaphors" (Saldana, 2016, p. 107). I was also mindful of the limitations of In Vivo coding, including the tendency to "limit the researcher's perspective on the data" (p. 108) and the researcher's "ability to transcend to more conceptual and theoretical levels of analysis and insight" (p. 110).

I found that many of the interviewee's comments were value laden. Both instructors expressed many of their personal thoughts and feelings and the connection that they had with their instructional design. These connections formed "rules for action" (Stern & Porr, 2011, p. 28) that inform the relationships between student to student and student to teacher interactions. Both instructors often made "I" statements, "I believe", "I like", "I believe" and "I think" which led me to believe that both mediums (LMS and Twitter) evoked a set of conceptual values, attitudes, and beliefs. Thus, I used Values coding, as per Saldana (2016), to "reflect the participant's values, attitudes and belied, representing his or her perspectives or worldview" (p. 131). Saldana (2016) reports that Values coding is particularly useful for action and practitioner research, case studies, and survey research. All of which are a part of this research project.

Additionally, Value coding is aligned well with categorizing attitudes, beliefs and emotions related to an experience (Aguis, 2013). Saldana (2016) states that value coding can be applied to almost any qualitative study but that it is "particularly for those that explore cultural values and belief systems, identity, intrapersonal and interpersonal participant experiences" (p. 132). Value coding could allow for a compare and contrast approach to the quantitative data supplied by the student surveys. LeCompte and Preissle (1993) attribute increased value to this approach by stating that "using multiple sources,

in fact, corroborates the coding and enhances the trustworthiness of the findings" (p. 264-5). Moreover, the qualitative approach may be informed by my quantitative instrument which is designed to collect and analyze the student's beliefs, emotions and values using either an LMS or microblogging platform for academic purposes. To this point Saldana (2016) states that Values coding "provides richer opportunities for gathering and assessing, in language-based meanings, what the participant values, believes, thinks and feels about social life" (p. 135). This focal point of this study is investigating these elements within the context of social and academic communication.

After completing the first cycle coding process (In Vivo and Values Coding), I proceeded to the second cycle coding process as per Saldana (2016). Saldana states "second cycle coding methods are advanced ways of reorganizing and reanalyzing data coded" (p. 234). Saldana adds that this second cycle "develop(s) a coherent meta synthesis of the data corpus" with the primary goal being "to develop a sense of categorical, thematic, conceptual, and/or theoretical organization" (p. 234). Saldana (2016) states that the "ultimate analytic goal is not just to transform data but to transcend them" (p. 235). The combination of these statements demonstrates the rationale and systematic approach to two-cycle qualitative analysis. Given the explanatory nature of this study, I chose to conduct Pattern coding for my second cycle of coding.

Pattern coding allows the researcher to conduct "more meaningful and parsimonious units of analysis" (Saldana, 2016, p. 236). Saldana states that Pattern coding is appropriate for the development of major themes, the search rules, causes, explanations, cross-case analysis and forming theoretical constructs and processes. This

meta code process enabled me to develop categorizations, summarizations, and conclusions that the abundance and sometime incoherent first cycle codes do not allow.

Review of Mixed Methods Approach

I decided to utilize a mixed methods approach to this study. It is not a robust mixed methods approach given the small sample size, lack of diversity of participants and failure to achieve qualitative saturation. According to Bryman (2006), there are several rationales for using a mixed method design; enhanced creditability, increased contextual understanding, creating informative illustrations, improving utility, confirmation, future discovery, and incorporating a diversity of views. I used the work of Schoonenboom and Johnson (2017) as a guide on how to effectively construct mixed methods research design. Schoonenboom and Johnson (2017) provide multiple major and minor design dimensions for consideration and "for the broad purposes of breadth and depth of understanding and corroboration," (p. 123). Additionally, I used the recent work of Lowenthal and Dunlap (2020) to help guide me in my mixed methods design. Lowenthal and Dunlap are renown distance education scholars have produced many of the foundational scholarship on social presence, online discussion, and community of inquiry. Lowenthal and Dunlap (2020) provide a mixed method explanatory case study design that is well aligned with the aims and objectives of this project.

The qualitative data of this study consists of two 45-minute, semi-structured interviews, from different instructors in two different timeframes (summer session and fall semester 2020) who taught the same course; OILS 541 The Adult Learner at the University of New Mexico. The first interview was conducted in July 2020 and the other

in March 2021. The interviews were conducted via Zoom meetings due to Covid 19 protocols. Both instructors expressed their consent to participate and were recorded via Zoom. These interviews were transcribed by me applying Microsoft Word and its Voice/Dictate feature. The rationale for choosing this procedure was to gain a personal experience of transcribing interviews, utilizing a reliable dictation technology, and employing coding techniques directly onto the transcription (Saldana, 2016).

Although my study is mainly quantitative in nature, it is an intent of the qualitative portion of this mixed methods study was to inform and deepen the understanding of this phenomenon. This data provides a more comprehensive, holistic understanding of the interconnectivity between students and instructors. Additionally, the qualitative portion of my study has provided a platform in which to conduct future research in the area of computer mediated communication (CMC). This area of study includes resilience, evoking and expressing emotionality, and student agency in distance education courses.

Conclusion

The implications for social and communicative exploration in distance education are undeniable. However, there are numerous social media outlets that have potential applications to online instruction discussion forums that require further study. The implications for social and communicative exploration in distance education are undeniable. This study used a mixed methods approach to investigate the influence that learning management systems (LMS) and microblogging (social media) have on key elements of distance education design. These elements include social presence, sense of

community, and overall user interface design. Students' perceptions of these elements were collected from students enrolled in OILS 541 during summer and fall 2020 by completing an adapted survey instrument built from previous scholarship. Data was analyzed quantitatively using non-parametric statistical testing. Qualitatively, instructors of record were asked a series of semi structured interview questions that were analyzed using In Vivo, Values and Pattern coding.

CHAPTER 4

RESULTS

Quantitative Findings

Construct: Affective expression (Social Presence)

	Median of Construct Average	p-value < 0.05 $H_0: m_1 = m_2$ $H_a: m_1 \neq m_2$
Summer	5.5	p-value = 0.2103
Fall	5	Fail to reject

Construct: Open communication (Social Presence)

	Median of Construct Average	$H_0: m_1 = m_2$ $H_a: m_1 \neq m_2$
Summer	6	p-value = 0.6578
Fall	6	Fail to reject

Construct: Group cohesion (Sense of Community)

	Median of Construct Average	$H_0: m_1 = m_2$ $H_a: m_1 \neq m_2$
Summer	6	p-value = 0.4223
Fall	5	Fail to reject

Construct: Connectedness (Sense of Community)

	Median of Construct	$H_0: m_1 = m_2$

	Average	$H_a: m_1 \neq m_2$
Summer	5	p-value = 0.3029
Fall	4.4	Fail to reject

Construct: Perceived user-interface design

	Median of Construct Average	$H_0: m_1 = m_2$ $H_a: m_1 \neq m_2$
Summer	5.75	p-value = 0.5017
Fall	4	Fail to reject

Construct: Perceived functionality (User-interface design)

	Median of Construct Average	$H_0: m_1 = m_2$ $H_a: m_1 \neq m_2$
Summer	5.5	p-value = 0.2122
Fall	4.25	Fail to reject

Construct: Perceived usefulness (User-interface design)

	Median of Construct Average	$H_0: m_1 = m_2$ $H_a: m_1 \neq m_2$
Summer	5	p-value = 0.2134

Fall	4	Fail to reject

Construct: Perceived ease of use (User-interface design)

	Median of Construct Average	$H_0: m_1 = m_2$ $H_a: m_1 \neq m_2$
Summer	6	p-value = 0.1872
Fall	5	Fail to reject

Qualitative Research Question and Sub-questions

RQ1: How do LMS and microblogging influence students' participation in an online learning environment?

SBRQ1: What aspects of LMS and microblogging influence students' participation in an online learning environment?

SBRQ2: How do instructors use LMS and microblogging as a resource to promote personal bonds (social presence) among students?

SBRQ3: How do instructors use LMS and microblogging as a resource to build a communal connection (sense of community) among students?

The results of the first cycle coding: InVivo and Values coding lead to utilizing Pattern coding as means to effectively summarize the findings.

Additionally, these categories formed after reviewing the most repeated codes, words, and phrases. Based on my Values coding, I identified eight distinct categories: **discomfort, limitations, technological potential, levels of participation, familiarity, interpersonal connection, format/structure and emotional reaction.** From here I used second cycle Pattern coding to summarize the individual categories into three major themes: **student apprehension, technical affordances, and positive attributes.** Tables 1 and 2 demonstrate the coding process in its entirety. Below are examples/excerpts of various categories and their connection to the three major themes. These examples give insight into the three-step coding process that I used to analyze the interview transcripts from Professor X and Y.

CHAPTER 5

SUMMARY OF FINDINGS

AND RECOMMENDATIONS

To become better educators, it is imperative for institutions of higher learning to explore this intimate relationship between technology and today's higher education student body (Bond, Buntins, Bedenlier, Zawacki-Richter & Kerres, 2020). For far too long, college and university educators have seen some modern technologies, cell phones, and other mobile devices, as distractions to the conventional learning process. It was the intention of this research study to dispel the notion that these essential technologies are a distraction and instead to compel the education community to recognize the positive impact and educational value of incorporating social media (Twitter) into distance education courses

Social media applications have a tremendous amount of sociocultural impact over society that covers over into academic institutions (Purvis, Rodger & Beckingham, 2020). More and more instructors are incorporating social media in their courses in attempt to speak the language of today's traditional student body. The growth of online education creates an opportunity for more research to explore how digital media influences traditional forms of education. The proliferation of free, open-source, and widely accepted social media platforms as created an opportunity for educators and administrators to reevaluate their curricula. It was the intention of this study to compare a traditional form of distance education communication mediums (LMS) with that of a social media platform (Twitter) with respect to key distance education constructs.

Discussion of Quantitative Findings

I was limited to using non-parametric statistical methods due to the small sample size of my study (n=18, Summer 2020 and n=7, Fall 2020). I was unable to run a paired-test and correlations because of the unequal sample size, and the fact that I different students participated in the two different surveys. The normality condition for parametric tests was assessed using the Shapiro-Wilk Normality Test. The Shapiro-Wilk Normality Test was performed and resulted in a distribution of X departed significantly from normality ($W = .096$, p-value < 0.01). This outcome necessitated a non-parametric test/analysis, and the median with the interquartile range were used to summarize the variable X.

Various statistical tests were considered to find an association between categorical variables (sex, age, race or ethnicity). Many of these tests were unusable due to the requirement of an expected outcome of at least 5 in all categories. It is also relevant to note most students expressing very similar, positive sentiments using both LMS and Twitter. This finding is similar to previous scholarship that states that participants can feel connected to one another regardless of the use of various communication technology (Exter, Korkmaz, Harlin & Bichelmeyer, 2009). This confirmative finding rejects the initial hypothesis of this project that a microblogging tool was going to produce a greater sense of community, social presence, and satisfaction in user-interface design.

The one question that rejected the null hypothesis was question #2: Question #2 asks students if they were “able to form distinct impressions of some of the course

participants". The result was that p-value = 0.0317 and thus a rejection of the null hypothesis. This is an interesting finding that it demonstrates that the summer session students expressed a higher degree of sense of identity and connection to one another to some small degree. Although this finding does not support my initial hypothesis it is worth discussing given the statistical significance. Scholars have argued that an opportunity, regardless of the medium, has shown to have a positive impact on core competencies of distance education (Exter, Korkmaz, Harlin & Nichelmeyer, 2009). Having the means of communication, via Tweets or traditional discussion posts, increased the student's awareness and response to their classmates being "real" people. This statement is aligned with previous scholarship that states that a LMS can produce an increase in classroom community (Rovai, 2002; Little-Wiles & Naimi, 2011).

All other questions and constructs demonstrated no significant statistical difference between the LMS and microblogging concerning social presence, sense of community and user interface design. These results are consistent with previous scholarship that states almost any communication medium can have a positive impact on key components of what constitutes effective instructional design in a distance education course (Sinnappan & Zutshi, 2011; Baisley-Nodine, Ritzhaupt, & Antonenko, 2018). These studies describe how factors more effectively contribute to these key components such as instructor participation, the availability of training resources, and the sense of security provided by non-open-source communication mediums.

The findings of this study confirm some of the principles shown in the previous scholarship. First, this study adds more depth to the Clark (1994) and Kozma (1994)

debate over the real impact that a particular medium has on learning. Although this study did not directly investigate the relationship between learning and microblogging/LMS, the lack of statistically significant result can be seen to contribute to Clark's notion "that media is neither sufficient for nor necessary to learning" (Clark, 1994, p.23). This statement is well aligned with a microblogging and LMS lack of influence over social presence, sense of community, and user interface design.

Additionally, this study refutes Gao et al. (2012) finding that the real-time access and mobile availability of microblogging encourages an increase in in-class participation. This is an important consideration because Gao et al. (2012) state that elements of accessibility could contribute to a greater level of satisfaction in an online course due to the notion that a participant could contribute at anytime, anywhere with the convenience of mobile technology. Pike, Smart, and Ethington (2012) contribute to this notion when they mention that the positive impact that socializing could have on academic environment. One of their arguments is that the ability to connect via a shared sociocultural aspect would lead to greater engagement and thus more student learning. Pike et al. (2012) contends that relating to your peers outside the course curricula could be seen as a worthwhile endeavor to bring students closer together in an online course. However, the results of this study do not align with this commentary.

Draft and Lengel (1984) contend that the richness of the media, additional features, resources, and opportunities for one to connect personally to each other, can contribute to an increased sense of social presence. It is a supposition of this study that microblogging to be more rich or dynamic than that of a LMS and thus would result in

more opportunities for students to share more intimate, congenial information with one another. The results of this study show that although the microblogging medium was richer in communicative attributes, it did not contribute to students' willingness to share personal information. These notions are contrary to Veletsianos (2012) findings that microblogging is better at producing more meaningful dialogue between participants in an online course.

Another key finding in this study is the lack of statistically significant difference between microblogging and the LMS relating to sense of community. Contrary to the work of Junco et al. (2011), microblogging did not increase the overall engagement and connection to each other and the course curriculum. Students expressed similar satisfaction levels, personal relatability, and communal connectivity using both microblogging and the LMS.

Discussion of Qualitative Findings

Qualitatively analyzing the two instructor interviews resulted in many interesting findings. The themes that emerged will help scholars better understand the intricacies of communicative interactions in an online course. Three major themes emerged from my review of coding systems: student apprehension, technical affordances, and technological potentiality. For Twitter, the instructor felt like that "it was very quickly apparent that students were not comfortable (with microblogging), there "was just such a low level of engagement", "I just don't think it's (microblogging) was a great fit for this course", and "There are some ways in which microblogging could be really useful". For LMS, the

instructor stated that her students felt a “really in-depth connection with each other”, and “they get really excited about them (receiving comments)”.

It seemed as though students experienced higher levels of social intimacy using the LMS in comparison with the class who used microblogging. Professor X expressed how students were able to easily navigate the LMS due to their familiarity with the software from previous coursework. Professor X mentioned that this familiarity could’ve led to more participation in discussion forums. One possible explanation for this increased participation was the students’ ability to take part in dialogue without the constraint of learning a new technology. This plausible justification is shared by information technology scholars Scott and Timmerman (2005).

In contrast, the instructor reported that the students using microblogging were concerned with “data, rights, and privacy” and “increased attention and scrutiny of social media”. The data shows that some of these reservations were a result of an unfamiliarity with microblogging and the more public nature of social media. Students’ familiarity with LMS’s discussion contributed to the overall positivity they expressed when communicating with one another in their online course. Whereas Twitter’s public nature, novelty, and apprehension inhibited students from fully connecting with their fellow classmates.

- Professor X’s Comment: “They’re (students) [are] just very tentative that first week”,
    - Values Code: Emotional Reaction

        - Pattern Code: Student Apprehension

This analysis demonstrates that Professor X perceived the students to be apprehensive during the first week of classes. There can be many reasons why a student is tentative during the first week of the semester such as managing instructor's expectations, unfamiliarity with fellow classmates and curriculum, and the varying degrees of locus of control (Schlechty,2011). One interesting supposition of this research study was how technology, in this case LMS or microblogging software, can negatively impact a student's perception of competency. I noted multiple occasions where Professor X stated how students' negative emotional reaction to some aspects of the technology could cause in increase in their perceptions of inadequacy.

- Professor Y's Comment: "I just don't know that microblogging is really the best space for that kind of interaction"
    - Values Code: Limitations
        - Pattern Code: Technical Affordances

This coding pattern is interesting because it demonstrates that the technology itself can impact the overall experience that the student has online. While this explanation is not new (Haddad, 2018), what is a relatively new and unexplored phenomenon is the impact, in this case negatively, microblogging has on a student's online experience.

Professor Y made many references to their & the students' apprehension to fully engage in an online discussion due to microblogging's open, public forum features.

- In Vivo Code: "They really care about making those connections"
    - Values Code: Interpersonal Connection

        - Pattern Code: Positive Attributes

Professor X makes mention on how important is that the students "connect" with their fellow classmates Professor X made similar comments like these throughout the interview, and I found that many of them were connected to the attributes (or lack thereof) of the technology used for communication.

- In Vivo Code: "I had one or two students who were very present and consistently engaged but most of the rest of the students, they would post one thing per week or something like that. They just were not really engaging."
    - Values Code: Levels of Participation
        - Pattern Code: Technological Affordances

Professor Y shared that the majority of their students were not engaged to their expectations. They felt that this lack of activity could be attributed to the technological affordances of the communication tool. This is an important finding because it answers various research questions regarding the overall engagement of students when they use certain communication technology in an online course.

I did not find a noteworthy difference between the instructor of record (IoR) for the summer session and the fall of 2020 in regard to social presence. Both IoR's noted that students in both semesters expressed a disinterest in sharing personal information, expressing reservations discussing topics outside of class and connecting with each other at a deeper communicative level as in previous semesters.

These findings are similar to the literature that reported insignificant differences in key communication constructs when using different mediums (Lee & Huang, 2018;

Soleimani, 2019; Tasir & Al-Dheleai, 2019; Oh, Bailenson & Welch, 2018). A plausible explanation for this lack of relationship is that social presence is influenced more by how the educator incorporates the various elements (personal expressions, openness, relatability) rather than the medium itself.

I did not find a meaningful difference between the IoR for the summer of 2019 and the fall of 2020 in regard to sense of community. Both IoR's noted that students in both semesters were often disengaged, unresponsive, and displayed a lack of participation not expressed in previous semesters. These findings are consistent with previous scholarship that report that a sense of community is not significantly influenced by the communication medium itself (Canevez, Maitland, Xu, Hannah & Rodriguez, 2021). A plausible explanation for this lack of relationship is that a sense of community is built and more easily influenced by specific educator actions such as being compassionate, interactive, using multimedia and adaptable (Berry, 2019). Professor Y mentioned their frustration and lack of confidence in the overall effectiveness of the microblogging to accomplish their student interaction initiatives. This was expressed when they used the words "ineffective", "student's reservations" and "learning curve".

Another plausible explanation is that students were more familiar with the traditional LMS and thus were less likely to communicate in the same manner with a new communication medium. This notion is consistent with previous scholarship that states students express an apprehension to communicate on a deeper level if they are required to use a new communication medium (Sheldon, 2008; Scott & Rockwell, 1997). The accessibility advantage of microblogging over that of the LMS, did not reveal itself in

this study. This finding is contrary to Tang and Hew (2017) who report that distance education participant is improved with increased functionality.

However, I did find a slight difference between the IoR for the summer of 2019 and the fall of 2020 in regard to user-interface design. The IoR for the fall of 2020 stated that their students expressed a high degree of apprehension using microblogging as a means for academic communication. The IoR stated students were fearful of the lack of privacy and expressed general mistrust for using social media to discuss class material.

The student's responses demonstrate no relationship between positive user-interface design and the communication medium, which is consist with previous literature (Alhadreti, 2021). However, an interesting finding was that the Professor Y, using microblogging for student communication, stated that some of the open-forum features may have contributed to lack of satisfaction. Other scholars have reported the importance of feeling safe and secure when communicating online (Hillard, Kear, Donelan & Heaney, 2020). Additionally, Professor Y stated that they did not see an increase in student engagement and participation in the discussions and the microblogging platform was in fact not easy to learn and use. These sentiments are not shared by previous scholarship as demonstrated by Junco et al (2012) and Gao et al. (2012) respectively. These contrary findings showcase the need for future research to explore other contexts, mediums, and instructional methods regarding the implementation of microblogging.

The instructor's commitment to and trust in the communication medium is paramount in achieving an effective instructional design in an online course. Professor

X's interview showcased their familiarity and support of the LMS, while Professor Y reluctance to use a new communication technology had an influence over the students' overall experience. Examining and reporting the instructors' perspective is a key contribution to the existing body of literature concerning incorporating microblogging to a distance education course. Tang and Hew (2017) recommended that more research be dedicated to exploring the perspectives of the instructors. This study has described the instructor's initial expectations, incorporation considerations, reservations and curricula implications for adding microblogging to an online course.

Additionally, this study adds to the discussion presented by Veletsianos (2012) who stated that his work was "to fill this gap in the literature by investigating scholars' practices in networked spaces" (p. 337). This study does indeed add to the discussion by describing the process in which an instructor incorporates microblogging into their curricula and the impact that this incorporation has on their pedagogical practices. This study could inform institutions, educators, and practitioners the procedural understanding of incorporation and also the ultimate ramifications it has on their students.

Implications for Practice

Although my hypothesis that microblogging would be a more effective mediums for key constructs of distance education (social presence, sense of community, and user-interface design satisfaction) was incorrect, there are some applications for instructors to consider. First, the negative impact of covid 19 on student's motivation, moral, and

general interest was clearly present in this study. Both instructors stated repeatedly that their students were disconnect in ways that was distinctly different than from previous semesters. This "connection" between and amongst students often times refers to interpersonal concepts of relatability, rapport, and shared interests (Mehall, 2020). Additionally, interpersonal and relational bonding is particularly important in distance education courses (Kaufman & Vallade, 2020).

This shared perspective had several negative implications to my study. Students' lack of participation resulted in instructors lowering their assessment expectations, offering academic accommodations, and lowering assessment expectations. For example, the summer IoR stated that their students said that they had covid issues that greatly inhibited their ability to communicate in more meaningful ways. The fall IoR stated that the dropout rate for their students was the highest that it's been in recent memory.

Recommendations for Future Research

The advice I would give future researchers in this area of study is three-fold. First, I would encourage the researcher to obtain a large sample size of students to survey. Most of the limitations of this study were due to the small sample size. I knew in advance that I would have to achieve consent from a large percentage of the class in order to conduct meaningful statistical analysis. Unfortunately, I obtained only a fraction of the participations in the fall course, and which led to insignificant results. Secondly, I would suggest that future research to consider a longitudinal study. My findings were based on two semesters' worth of data which proved too small to provide meaningful comparisons.

One recommendation for more short-term studies would be to locate a course with a large enrollment number. My suggestion would be to aim for an enrollment number between 50-75 due to my consent to participate rate being that of 40%. Thirdly, I would work more diligently with instructors to demonstrate the value of conducting this type of research. I found that any hesitation on the part of the instructor to participate in the study will matriculate down to the students. One way in which to increase instructor buy in would be to share the findings and recommendations from previous studies.

Additionally, instructor should consider the technical affordances of each communication medium. The fall IoR stated the effectiveness of a particular technology is due in large part to its innate abilities, features, and unique aspects to accomplish a particular task. While context, timing, and conditionality are all a part the success equation, the fall IoR used the illustration of hammer being used properly and improperly. This analogy demonstrates that although a hammer can do a great many things, its best use is to insert nails into material. Instructors should look at educational technology more as a hammer rather than a utility tool. A resource that has certain attributes or affordances increases or decreases a certain outcome. This realization was a result of uncovering the narrative themes expressed by the instructors' interviews.

Conclusion

I contend that most instructors want to be the best educators they can be. One of the ways they can improve their practice is to be innovative in their approach to teaching. Trying and incorporating new pedagogical practices is often considered a desirable trait.

This was this personal desire that served as the impetus for this research project. I wanted to see if a free, well-known, and familiar social media platform could transcend the limitations of a traditional learning management system (LMS).

Although the sample size was too small and my hypothesis proved to be incorrect, I uncovered many interesting findings. First, I found that there were no statistically significant differences between those who used microblogging and those who used LMS for their distance education courses. In both cases, students stated that the personal presence was conveyed, expressed a sense of connection to their classmates, and thought that the medium was effective in communicating academic material in an online environment. This finding is noteworthy due because of its vastly differently user-interface design and the unfamiliarity with using microblogging in their college courses. Those that agreed to use microblogging for their online discussions stated similar perspectives with those that used LMS. I do not if this finding is based on their familiarity with microblogging or a commitment to try a new communication medium. In both cases students felt that both mediums were effective in achieving stated goals.

In conclusion, this study demonstrates that students find value in communicating with their peers irrespective of the communication mediums. The act of sending and receiving messages of a positive nature can increase the overall satisfaction of students in a distance education course. The two variables that greatly influenced this communicative dynamic was COVID 19 and the unfamiliarity with using microblogging in an academic setting. Both students and instructors expressed their discomfort in pursuing their academic endeavors during a pandemic. Another common thread from the instructor's

interview was the hesitation students expressed using microblogging for a college course. Although microblogging is one of the most widely used forms of communication for news updates, financial information, pop culture references, and other sociocultural phenomenon, students felt at unease using this medium for in class discussions.

This research adds to the corpus of research that shows the potentiality of incorporating technologies into modern pedagogical practices. This study and its subsequent findings show that instructors should consider the affordances of resources and evaluate if those affordances fit the context and learning outcomes of the course. Although the findings of this study were not what I anticipated but it has not dissuaded me from continuing my journey on finding the newest, and most effective technologies to further develop my pedagogical practices.

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APPENDICES

APPENDIX A

Student Survey Instrument

Survey Instrument – All questions will be placed in a 5-point Likert scale (Strongly Agree to Strongly Disagree). Surveys will be administered via survey monkey or another online medium.

Social Presence – Garrison, Anderson, & Archer (2001) ***Community of Inquiry Instrument***

Construct - Affective expression

1. Getting to know other course participants gave me a sense of belonging in the course.

2. I was able to form distinct impressions of some course participants.

3. Online or web-based communication is an excellent medium for social interaction.

Construct - Open communication

4. I felt comfortable conversing through the online medium.

5. I felt comfortable participating in the course discussions.

6. I felt comfortable interacting with other course participants.

Construct - Group cohesion

7. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.

8. I felt that my point of view was acknowledged by other course participants.

9. Online discussions help me to develop a sense of collaboration.

Sense of Community – Rovai (2002) ***Classroom Community Scale***

Construct – Connectedness

10. I feel that students in this course care about each other

11. I feel connected to others in this course

12. I do not feel a spirit of community

13. I feel that this course is like a family

14. I feel isolated in this course

15. I trust others in this course

16. I feel that I can rely on others in this course

17. I feel that members of this course depend on me

18. I feel uncertain about others in this course

19. I feel confident that others will support me

Perceived user-interface design - Cho, Cheng and Lai (2009) ***PUID***

Construct - Perceived user-interface design

20. The layout of the chosen e-learning tool is user-friendly

21. The computerized instruction provided by the chosen e-learning tool is clear

22. The layout of the chosen e-learning tool is in good structure

23. Overall user interface design of the chosen e-learning tool is satisfactory

Construct - Perceived functionality

24. The features of the chosen e-learning tool enable me to learn faster

25. The chosen e-learning tool provides sufficient features that I need

26. The features of the chosen e-learning tool enable me to access the content that I need

27. As a whole, the features of the chosen e-learning tool enable me to achieve my learning goals

Construct - Perceived usefulness

28. Use of the chosen e-learning tool enabled me to learn more quickly

29. Use of the chosen e-learning tool improved the quality of my learning environment

30. Use of the chosen e-learning tool enhanced the effectiveness of my learning

31. As a whole, the chosen e-learning tool is useful to me

Construct - Perceived ease of use

32. Use of the chosen e-learning tool is simple

33. I have no trouble in using the chosen e-learning tool to perform task that I needed

34. The chosen e-learning tool provides information that is easy to comprehend

35. As a whole, the chosen e-learning tool is easy to use

APPENDIX B

Instructor Interview Questions

Research Question:

RQ1: How does LMS/microblogging influence students' participation in an online learning environment?

Sub-questions:

SBRQ1: What aspects of LMS/microblogging influence participation in an online learning environment?

SBRQ2: How do instructors use LMS/microblogging as a resource to promote personal bonds [social presence] among students?

SBRQ3: How do instructors use LMS/microblogging as a resource to build a communal connection [sense of community] among students?

Instructor Interview Questions:

Overall Experience

1. Please describe your overall experience using LMS/microblogging as a platform for creating classroom discussions?
2. Which features of LMS/microblogging did you find encouraged or discouraged overall student participation in discussion forums?
3. What would you have done differently, if anything, to encourage more participation in these discussion forums?

4. What guidance would you give other instructors who might use LMS/microblogging for their online discussion forums

Social Presence

5. How important is it for students to establish a personal connection with each other in an online learning environment?
6. Which features of LMS/microblogging did you find influenced interpersonal bonding?
7. What do you consider demonstrates establishing a personal connection in an online environment?
8. How did you encourage students to share this type of personal connection?

Sense of Community

9. How important is it for students to build a sense of community in an online learning environment?
10. Which features of LMS/microblogging did you find influenced communal connectivity?
11. What do you consider to be building community in an online learning environment?
12. How did you encourage students to build this sense of community?

Table 1: Interview Analysis with Professor X

Interview Text Professor X	InVivo Code	Values	Pattern Code	Pertinent Memos
"I've used the discussion function for every single class undergraduate and graduate that I've had. Using the discussion tool gives them a really in-depth connection with each other."	"used the discussion function for every single class"	Familiarity	Positive Attributes	I noticed the overall importance of peer-to-peer communication to distance education courses.
	"really in-depth connection with each other"	Interpersonal Connection		
"They really get to know each other. I get feedback from them constantly about how much they learn from each other and how much they appreciate it. They get more from that (discussion forums) than they do from me."	"really get to know each other"	Interpersonal Connection	Positive Attributes	This peer-to-peer communication led to an increase in the students' overall positivity towards the course as a whole.
	"learn from each other and how much they appreciate it."	Interpersonal Connection	Positive Attributes	
"Attachments yes are encouraged but not required in	"Attachments yes are encouraged"	Motivation		

this class. Except this one time we used drop box to post." "One drawback with LMS Learn is that the system could not accommodate students substituting a video instead of a text. I mean it's an option for them, but the drawback is that its highly text based." "There's just not much flexibility even though they kind of claim. Often times LMS Learn says "this video is going to be too long for an LMS upload." "My findings included that that they really care about making those connections	"One drawback with LMS Learn" "system could not accommodate students" "the drawback is that its highly text based." "not much flexibility even though they kind of claim." "they really care about making those connections" "They want to	Limitation Limitation Limitation Limitation Interpersonal Connection Interpersonal Connection	System Constraint System Constraint Positive Attributes	The capabilities of the software platform (LMS) negatively impacted the communication process. Evoking positivity between and amongst participants is an important aspect of distance education.

with each other. They want to have that sense of community. I noticed that when I read their comments back and forth to each other, they connected on a professional level. They discovered those commonalities that they would not have if we did not have this kind of discussion." "I would say it's when they move beyond a technical discussion. They're not just asking and answering a question. It's more the warmth that they express between each other, the way they structured their comments. I would say it's	have that sense of community" "They discovered those commonalities" "move beyond a technical discussion" "They're not just asking and answering a question" "the warmth that they express between each other" "rapport that I build with them"	Interpersonal Connection Format/Structure Format/Structure Interpersonal Connection Interpersonal Connection Interpersonal	System Constraint Positive Attributes	A relationship exists between system constraints and students' perceptions of positivity.

the same kind of rapport that I build with them."		Connection	Positive Attributes	
"I mean I don't know them. I would not know them if I passed him on the street, but I know them based on our exchanges. I send a lot of course messages. I'm giving them feedback on their papers and sometimes they comment back to me. It's the same kind of thing."	"I know them based on our exchanges"	Interpersonal Connection		
	"There's a warmth between us."	Emotional Reaction		Students expressed discomfort early in the process.
"There's a warmth between us. There's a familiar kind of interaction and they talk about other"	"They're just very tentative that first week"		Discomfort	This discomfort can be connected to unmet communicative expectations.
		Emotional Reaction		
	"nobody's pouncing on them"		Discomfort	
		Emotional		

	“Nobody's gonna criticize”	Reaction Emotional Reaction		

Table 2: Interview Analysis with Professor Y

Interview Text With Professor Y	InVivo Code	Values	Pattern Code	Pertinent Memos

"I think it was it was very quickly apparent that students were not comfortable. They didn't have a way to easily share and discuss their work. They were very clearly uncomfortable discussing their work in the microblogging environment." "I ended up organizing the microblogging conversations more around like topics to explore but it was just such a low level of engagement from students. You know they were actually receiving partial credit in the class for doing that (participating in Twitter). But by the end of class I ended up not even counting that (these points) in the grade book at all. " "I had one or two students who were very present and consistently engaged but most of the rest of the students, they would post one thing per week or	"not comfortable" "They were very clearly uncomfortable" "such a low level of engagement" "not even counting that (these points) in the grade book at all"	Discomfort Discomfort Levels of participation Levels of participation	Student Apprehension Disengaged	The instructor noticed students' initial hesitation using microblogging to discuss "share and discuss" their work. Students lack use and perceived value of Microblogging as an effective communication tool in a distance education course.

something like that. They just were not really engaging."				
"I just don't think it's (Twitter) a great fit for this particular class and this particular use."	"They just were not really engaging."	Levels of participation	Disengaged	Students would meet but not exceed communication expectations.
"We tried to encourage a lot of participation. I was even on (Twitter) there early modeling, trying to engage, tagging people, you know things like that. I've been involved in a lot of microblogging conversations so it's not like I'm a novice to the environment myself, it just did not come together or gel."	"I just don't think it's (Twitter) a great fit for this particular class"	Limitations	Technological Affordances	
		Levels of participation		
	"We tried to encourage a lot of participation."			
"I think because it's just a mismatch between the nature of what we're doing in this particular class, in discussions and what microblogging is really good for."			Disengaged	The instructor was well versed in the capabilities of microblogging but did not see the same passion expressed by the students.
		Levels of participation		
"I just I would use very different tools but that's not to throw the baby out with the bathwater."	"it just did not come together or gel."			

“There are some ways in which microblogging could be really useful.”		Limitations		
“I think it (Twitter) could be great for those types of community building activities or instructional activities. “	“what microblogging is really good for”	Limitations	Technological Affordances	
“They're uncomfortable, their self-efficacy is low, and I just don't know that microblogging is really the best space for that kind of interaction. “	“I just I would use very different tools”	Technological Potential		
“I was going to say I'm not sure I saw a lot of interpersonal bonding via Twitter.”	“There are some ways in which microblogging could be really useful”	Technological Potential	Alternative Use	The instructor sees the communicative potential of microblogging but cautions against using in Microblogging in a distance education course.
“Nothing much occurred in our class, so that's hard to say. I think this comes through private communications from students but again I think it's the public nature of Twitter.”	“(Twitter) could be great for those types of community”	Limitations	Technological Affordances	
“For many of them it really inhibited how much they were really willing to engage and share to build relationships.”	“I just don't know that microblogging is really the best space for that kind of interaction.”	Discomfort	Student Apprehension	The instructor did not see an increase in

				students' sense of interpersonal bonding, self-efficacy, and sense of community.
"This dynamic may explain the reasons for low survey scores. I had a number of students who would email me who said, "I'm sorry I'm not participating there (Twitter) I'm just not comfortable with that space. "	"I'm not sure I saw a lot of interpersonal bonding"	Levels of participation	Disengaged	
	"Nothing much occurred in our class"			
"I think microblogging inhibited their ability to choose (their preferred method of communication)."		Levels of participation		The instructor seems to think that the public nature of Microblogging inhibited the students' connectivity with another.
"Like I just said, I have seen colleagues use (Twitter) in their own classes but that it's very hit or miss. It varies depending on time, the students who were in the class and their comfort level."	"For many of them it really inhibited how much they were really willing to engage"		Disengaged	
"I would say, about pretty much any technology, if you really have to think about what the affordances of microblogging are."		Levels of participation Discomfort	Student Apprehension	
"I can see where if part of your purpose or focus is really on public engagement than perhaps you use	"I'm not participating there (Twitter)"	Levels of participation	Disengaged	

microblogging/Social Media"	"I'm just not comfortable with that space"			
	"I think microblogging inhibited their ability to choose"	Technological Potential		
	"use (Twitter) in their own classes but that it's very hit or miss."		Technological Affordances	
		Technological Potential		Microblogging has the potential to achieve instructional goals but only in specific contexts.
			Disengaged	
		Levels of Participation		