

DISSERTATION

SOCIAL MEDIA IN THE CURRICULUM AND CO-CURRICULUM: PRE-SERVICE
TEACHERS AND THEIR COLLEGIATE PEERS

Submitted by

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ABSTRACT

SOCIAL MEDIA IN THE CURRICULUM AND CO-CURRICULUM: PRE-SERVICE TEACHERS AND THEIR COLLEGIATE PEERS

Although use of social media by students has been shown to be nearly ubiquitous, many K-12 school systems have banned its use on their campuses or use between their teachers and students. In contrast, many collegiate faculty have utilized social media in their teaching. Social media has been shown to assist faculty in engaging with students, helping students engage with content outside of class and sound implementation into the curriculum has been shown to have positive educational impacts. Data from a sample of two thousand and fifty-six college students across two land-grant institutions is compared between pre-service teachers and their collegiate peers. Pre-service teachers reported using Twitter in the curriculum more, were more inspired by the use of social media use by their faculty, used social media more on their own for educational purposes and had a stronger belief that social media can be used for educationally relevant purposes than their collegiate peers.

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CHAPTER 1: INTRODUCTION

Empirical research indicates that when faculty use social media in pedagogically sound ways, it increases college student engagement, academic performance and first-to-second year retention (Junco, Elavsky, & Heiberger, 2012; Junco, Heiberger, & Alonso Garcia, In Review; Junco, Heiberger, & Loken, 2010). Additionally, studies show Facebook use is correlated to additional positive educational outcomes. Junco (2012) found that creating or RSVPing to Facebook events, commenting on Facebook posts, and viewing Facebook photos were positively correlated to student engagement as measured by a NSSE scale. Junco (2012) also found that using Facebook for collecting and sharing information was positively predictive of collegiate GPA. Facebook has also been shown to have impacts prior to college matriculation. Wohn et al. (2013) found that Facebook use by first generation college students is correlated to increased information literacy efficacy regarding college application procedures.

Social media is a major component in the lives of nearly all Internet connected adults and teens, and educators are increasingly open to adopting new methods and technologies to reach, engage and help students learn. Empirical research is beginning to emerge regarding social media's impact on relationships, psychosocial development and efficacy in education (Bachrach et al., 2012; Burke, Marlow & Lento, 2010; Correa, Hinsley, de Zuniga, 2010; Gonzales & Hancock, 2011; Gosling et al., 2011; Zywicki & Danowski, 2008; Suler, 2004; Seidman, 2012).

Many K-12 educators use social media for their own professional development through the use of Personal Learning Networks (PLN). With twitter alone there are hundreds of hashtags being used in the K-12 space, and numerous weekly chats used to develop ideas, share best practices, and initiate and maintain professional relationships (Heick, 2013). By contrast because social media is often used for entertainment, some secondary educators have reservations about

the use of social media in their classrooms. Considering the positive impacts it can have on engagement, research regarding social media's pedagogically sound integration into the curriculum and co-curriculum should be explored within the K-12 system. One of the major ways that social media may be infused into the K-12 system is by increasing the use of social media in the college curriculum for pre-service teachers.

Current research is limited on student exposure to pedagogical approaches to social media in the curriculum. It is still largely unknown if pre-service teaching majors are being trained on, are being modeled appropriate use, or are encouraged to find innovative ways to use social media in their future profession. A few of the research questions addressed in this study include: are pre-service teaching students using social media at the same rates as their collegiate peers in the curriculum? Do they intend to use social media in their future profession at the same levels as their collegiate peers?

Research shows the potential for properly implemented social media interventions to increase college student engagement, and academic performance (Gao, Luo & Zhang, 2012; Junco, Elavsky, & Heiberger, 2012; Junco, Heiberger, & Alonso Garcia, In Review; Junco, Heiberger, & Loken, 2010). Yet some K-12 systems ban social media use on their premises and some ban social media use by their faculty and staff (Register, 2012; Frazier, 2013). In contrast, faculty in higher education are increasingly more apt to use social media in college classrooms and many student affairs personnel are using social media to engage college students in the co-curriculum (Faculty Focus, 2010). Because faculty present the educational and career related usefulness of social media to their students in different ways (Moran et al., 2012), it is hypothesized that students' experiences in the college curriculum will be different. The hypothesis:

“pre-service teachers are required to use social media less in their curriculum, use social media less on their own for coursework and plan to use social media less in their future careers in comparison to their collegiate peers. Additionally, because social media use has been positively related to student engagement it is hypothesized that pre-service teachers will also score lower on the engagement scale.” will be addressed.

Research needs to be conducted to determine the differences in social media experience based on the undergraduate student major, most notably pre-service teachers compared to their non-pre-service collegiate peers. Since pedagogical differences exist between current K-12 and post-secondary educational systems regarding social media policy and adoption, an exploration of the higher education programs that educate future K-12 educators needs to be conducted. If pre-service teachers use social media in the curriculum at lower levels than their collegiate peers and don't plan to use social media in their future profession, this study may be an impetus for pre-service teaching programs to reconsider their integration of social media into the curriculum.

This dissertation will investigate if pre-service teachers plan to use social media in their future profession and how much they are using social media in their college curriculum and co-curriculum. College students who are planning to teach at the K-12 level will be compared to their non-pre-service collegiate peers with regard to their social media use, perception of social media, planned use of social media in their future careers and engagement (as measured by the National Survey of Student Engagement).

Purpose of the study

The purpose of this study is to determine if differences exist in how pre-service teachers experience social media in the curriculum and co-curriculum in contrast to their non-pre-service peers at the university. Studies have shown a relationship between student engagement and social

media use, student engagement will also be measured and compared between groups to validate previous research.

Statement of the research problem

Social media's use in the curriculum and co-curriculum has been shown to have positive impacts on student learning and engagement, but many K-12 systems don't allow social media in their curriculum because of the perceived potential dangers in security concerns or development of inappropriate relationships between students and faculty. Because of media hype, and even action by school boards, future educators may be hesitant to utilize social media in their teaching (Register, 2012; Headlee, 2012). Additionally, media coverage of inappropriate uses of social media by respected individuals in society and the consequences of lost jobs or social status that often follow may be inhibiting planned or actual use of social media in educational settings (Broderick and Grinberg 2013; Warren, 2011). But because there are empirical studies that show the positive impacts of using social media in pedagogically sound ways and future K-12 educators need to be educated and trained how to use social media appropriately within the curriculum (Heiberger & Harper, 2008; Junco, Heiberger, & Alonso Garcia, In Review; Junco, Heiberger, & Loken, 2010, Gao, Luo & Zhang, 2012). These educators also need to help their students develop positive online identities as they will be valuable for their career success. For example, students need to develop positive online identities so they can model appropriate online behavior for their future K-12 students.

Many states are projecting growth of minority and urban high school graduates (Warner & Mercer, 2013). Some studies have shown that minority and urban students use certain social technologies at higher rates than their collegiate peers (Brenner, 2013; Junco, Merson & Salter, 2010; Gahran, 2013; Heiberger, Harper & Lewis, in review). This factor may compound with the

potential underuse by pre-service teachers and K-12 teachers because they may not be prepared to meet the needs of this new demographic of student.

Inappropriate use of social media has caused a fear of negative consequences of using social media inappropriately in K-12 careers. Thus, it is hypothesized that pre-service teachers are required to use social media less in their curriculum, use social media less on their own for coursework and plan to use social media less in their future careers in comparison to their collegiate peers. Additionally, because some studies have shown social media use to be positively related to student engagement it is hypothesized that pre-service teachers will also score lower on the engagement scale.

Research questions

The following research questions will be addressed in this study:

1. Do differences exist in self-reported use, perceptions or attitudes about social media between pre-service teachers and their collegiate peers?
2. Is there a correlation between a college student's own self-reported use of social media for coursework and their faculty's use of it in the curriculum?
3. What medium of social media do pre-service teachers and their collegiate peers prefer for coursework and instructor-student communication?
4. Are there differences and associations among pre-service teachers, their collegiate peers and their National Survey of Student Engagement (NSSE) scores and social media use?

The data collected to answer these questions will continue to add to the emerging literature regarding social media in education.

Definitions of terms

For purposes of this study the following definitions of terms are used.

Social media: “includes web-based and mobile technologies used to turn communication into interactive dialogue between organizations, communities, and individuals” (“Wikipedia Social Media,” 2012).

Student engagement: “...represents two critical features of collegiate quality. The first is the amount of time and effort students put into their studies and other educationally purposeful activities.” (NSSE, 2012).

Pre-service teachers: college students enrolled in a curriculum designed to prepare them for becoming classroom educators in the K-12 system.

Collegiate peers: all students enrolled at a the institution who are not enrolled in a pre-service program.

Limitations & delimitations

The researcher collected data through self-report online surveys at two institutions of higher education: South Dakota State University and Colorado State University. The limited number of campuses sampled and the self-report data collection limit the generalizability of the findings. This study is not intended to generalize to two-year or other technical and certificate granting institutions. The voluntary participation in the study also limits generalizability.

Need for & significance of the study

This study is significant to multiple constituencies. It is first and foremost significant to the higher education faculty who educate future K-12 teachers. Little is known about the differences in social media knowledge, use, and proficiency between students who are future K-12 teachers and their collegiate peers from non-teaching majors. One of the goals of many pre-

service programs is to prepare teachers who will prepare future citizens who will contribute in positive ways to society. This positive contribution may be through creating a participatory culture in the educational setting through social media. Teachers can create a more individualized learning environment through the use of social media. Individualized learning environments, like those created in social media, have been shown to increase learning gains (Jenkins, 2009 & Bruce, 2002). This study will help higher education faculty teaching in pre-service teaching programs understand their student's experiences with social media in the curriculum and co-curriculum.

Finally, social media researchers, faculty, and administrators will have additional empirical research regarding student engagement, social media and the differences in experience based on major. This research will provide information to decide on policy, support systems and approaches to facilitating increased student engagement. Currently there is research showing social media to be a beneficial tool to engage students, enhance academic performance and impact retention.

Subjectivity in research

The researcher has been involved in and conducted previous quantitative descriptive and quantitative associational research regarding social media, and experimental design and qualitative research regarding use of social media (Harper, Lewis, & Heiberger, In Review; Heiberger & Harper, 2008; Heiberger & Junco, 2011; Junco et al., 2012; Junco et al., In Review; Junco et al., 2010). As such, the researcher's teaching pedagogy and research paradigm are influenced by these findings. The role as an academic advisor, instructor and higher education administrator build the framework for the lens through which the researcher engages with the

university and its students. A research-based approach acknowledges that social media can be used in educationally relevant ways to increase engagement, grades and retention.

Summary & Structure of the Dissertation

This dissertation presents the literature that supports the claims made previously in this chapter, the methods of the current study, and the results and discussion of the study. The study is aimed at determining if and to what extent differences exist by college student major with regards to student engagement, curricular and co-curricular social media use. This study is directed by previous research and literature that points to the lack of research examining the use of social media by student major.

K-12 systems often ban social media use while many in higher education have adopted it for their professional development or are implementing it in their curricular or co-curricular interactions with students (Faculty Focus, 2012; Seaman, J. & Tinti-Kane, H., 2013). Fear drives the ban in many situations as school boards struggle to keep students, faculty and the community safe from the potential dangers of inappropriate relationships, information sharing or information gathering that may happen on social media. This difference in approach calls for the exploration of the potential differences that exist between how students experience their undergraduate coursework and co-curriculum with regards to social media. Are pre-service teachers utilizing this technology at the same rates and are they required to use it in their coursework at the same levels as their collegiate peers? If not, what are the implications for their planned future use of this technology and what potential effects does this have on the educational ecosystem?

The following chapter will discuss research and policy regarding student engagement, student success, and social media's use in the curriculum and co-curriculum, and researchers'

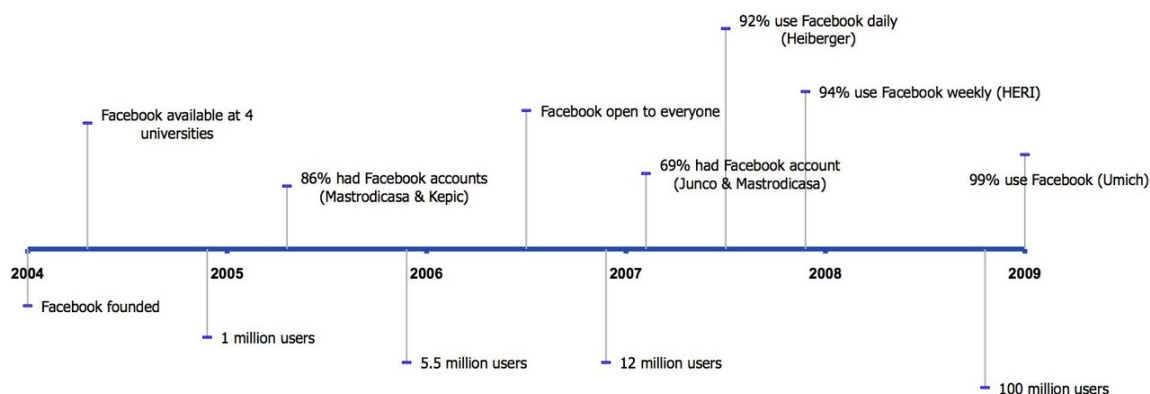
calls for future research in this area. It is followed by this study's methodology, results and discussion.

CHAPTER 2: LITERATURE REVIEW

Student social media use

Wikipedia defines social media as “including web-based and mobile technologies used to turn communication into interactive dialogue between organizations, communities, and individuals” (2012). Most recently social media such as YouTube, Twitter, Reddit, Facebook, Google Plus, Flickr, and Second Life have been some of the most popular social media platforms. Facebook is the most widely used social media platform in the world. Since Facebook’s founding in 2004 it has grown to over 1 billion active users, 526 million of who sign on everyday. Facebook’s site is translated into over 70 languages, with over 80% of users outside of the US and Canada (Facebook.com, 2012). Another highly used social media platform is Twitter. Twitter is classified as a micro-blogging platform, and compared to Facebook is much simpler to use and limited to 140 character communications. Twitter has 140 million active users (Twitter, 2012). A timeline of Facebook adoption by college students can be found in figure 2.1.

Figure 2.1.



blog.reyjunco.com

High percentages of college students have Facebook accounts and that they are using social networking regularly (Hurtado, 2007; Heiberger & Harper, 2008; Junco & Mastrodicasa, 2007). The Educause program that is housed at UW-Madison funded additional research to gather information regarding the technology experiences of college students. The Educause Center for Analysis and Research (ECAR) Study of Undergraduate Students and Information Technology was the largest educational technology student survey of its kind in the country and included 115 institutions. Data from 2006-2009 is published in their most recent report (Smith, Salaway, & Caruso, 2009). Some of the important changes highlighted include a dramatic increase in social networking use (from 65% to 87%), the increased use of course management software and the increased ownership of handheld Internet devices (over 50% of students). 2012 data shows students using Facebook less for academic purposes (-7%), Twitter more (+18%), other social networking sites more (20%) in 2012 as compared to just a year prior. Additionally, students are required to use LinkedIn and social studying sites at 20% and 26% more than in 2011 (Dahlstrom, 2012).

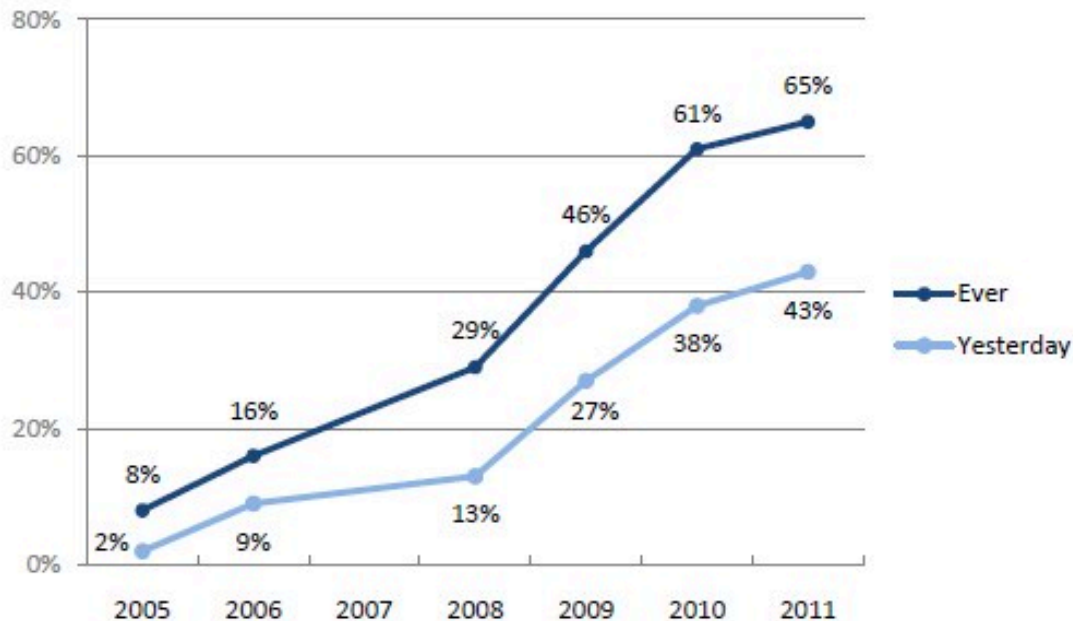
Although this data is the best and largest dataset that exists regarding technology and college students, the dataset is somewhat flawed, especially due to response rate. The overall ECAR response rate was 10.4%, but the institutional response rates varied from .4% to over 44%. The aggregate report includes all participants although the generalizability of the institutional response rates under 10% is very questionable. With such low response rates, the sample cannot be said to be representative of the participating institutions yet alone generalized to non-participating institutions.

The Pew Internet and American Life Project (Brenner, 2012) is a higher quality source for data regarding social networking use among the US population. According to Pew research,

as of February 2012, 66% of online adults use social networking sites. Social networking sites are most popular with 18-49 year old individuals, those with some college education and a household income of less than \$30,000 per year. This is an intriguing statistic as some of our largest challenges in education come from students with a low socio-economic status. The highest reported reason for using these sites is to stay connected to friends and family and to reconnect with individuals they have lost touch with. The trends indicate this growth of use will be sustained. Ninety-five percent of 12-17 year old teens are now online and 80% are social media users. This growth in social networking is highlighted in figures 2.2 and 2.3.

Figure 2.2. Social networking site use by online adults

Social networking site use by online adults, 2005-2011
The percentage of all adult internet users who use social networking sites since 2005

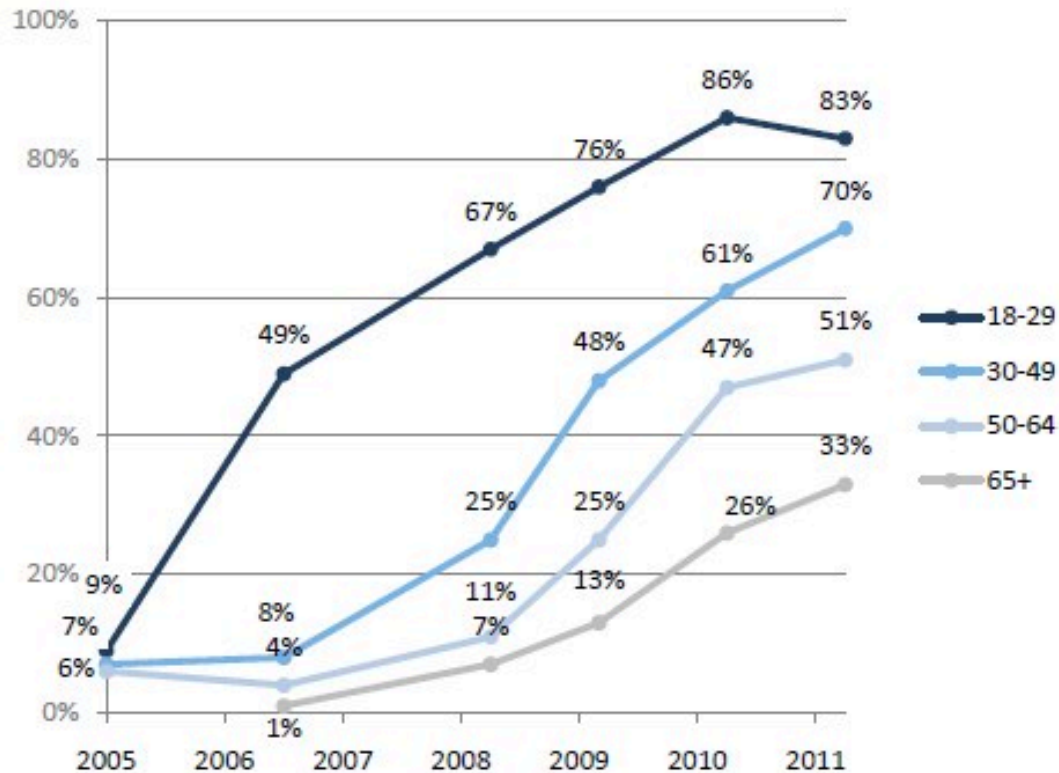


Source: Pew Research Center's Internet & American Life Project surveys: February 2005, August 2006, May 2008, April 2009, May 2010, and May 2011.

Figure 2.3. Social networking site use by age group

Social networking site use by age group, 2005-2011

The percentage of adult internet users in each age group who use social networking sites



Note: Total n for internet users age 65+ in 2005 was < 100, and so results for that group are not included.

Source: Pew Research Center's Internet & American Life Project surveys: February 2005, August 2006, May 2008, April 2009, May 2010, and May 2011.

Social media & education

In 2011 the Center for the Study of Higher Education at the University of Arizona and Claremont Graduate University conducted a literature review and meta-analysis of social media research in higher education. A review of Community College Survey of Student Engagement (CCSSE) data showed that the more students use social media technology for academically purposeful activities, the higher their levels of engagement. This may indicate the use of social media in the curriculum by community college faculty in pedagogically sound ways. But

certainly this data shows the diversity of institutions that report this relationship between engagement and social media use. Just as previous research at 4 year college and universities shows a connection between engagement and social media use – the results above indicate that social media in education may be connected to other desired outcomes of education at community colleges as well (notably engagement as measured by CCSSE).

Academics utilize social media in the educational setting with various positive outcomes. Johnson (2011) showed that instructors who share personal information versus those who share content only on social media sites are viewed more positively when rated for credibility by their students. A study by Yu (2010) showed the potential for student learning outcomes to be boosted by social networking use in the academic curriculum. Junco et al. (2011) has shown that social media use can be used in pedagogically sound ways to improve student engagement (as measured by a modified NSSE), grades and first-to-second-year persistence. Junco (2012) has also shown the nuanced differences among social media use by students and its relationship to student outcome variables.

While correlational studies of Facebook use and student engagement have shown a positive relationship, the same does not hold true for academic performance. The most recent published research on the relationship between Facebook use and academic performance was published by Dr. Rey Junco in 2011. He examined the relationship between Facebook use, which is one particular aspect of technology usage, and academic performance. They found that there was no relationship, and in particular *no negative relationship*, between Facebook usage and grades. Undertaken in response to the widespread media coverage of Karpinski's work, Pasek et al. (2009) note that although Karpinski (2009) found a negative raw correlation between grades and Facebook usage, the study was limited due to a small, convenience sample and the analytical

design utilized. These findings were supported by Martin's (2009) unpublished study that found no correlation between Facebook usage and grades.

While the studies of Facebook use and grades have provided important data, until recently only one of the studies had been peer reviewed (Pasek et al., 2009). Junco (2011) revealed that time spent on Facebook was significantly negatively related to overall GPA, while only weakly related to time spent preparing for class. Furthermore, using Facebook for collecting and sharing information was positively predictive of the outcome variables, while using Facebook for socializing was negatively predictive. Given the few studies available and the conflicting findings, it is important to add to the literature on social media's role in college students lives (Kirschner & Karpinski, 2010).

Most recently, a meta-analysis examining research publications specific to Twitter affirmed the social networking site has relevant potential for the promotion of classroom learning (Gao et al., 2012). Henry (2010) showed that communications between students and faculty via technology increased a sense of well-being and a sense of community. Lei (2010) showed another nuanced outcome of using technology. This study showed that learning outcomes were met at higher levels when technologies were used with 7th and 8th graders for social purposes in addition to solely for the course content.

Although many faculty are most concerned with what happens within the classroom there are some studies that point to out-of-class experiences having significant effects on outcomes. Shapley et al. (2010) report that out-of-class technology use was the best predictor of meeting learning outcomes. Junco, Elavsky & Heiberger's (2011) study also support this concept of best practice with using social technologies outside of the classroom to extend the learning experience outside of the physical space.

Additionally, Cho (2007) showed that the central actors within the classroom network (those with more connections within the network) ended the course in the study with a higher final grade. Burke (2011) showed that even passive communication could be valuable to students. Those receiving messages showed an increase in social capital and those who were even more passively engaging were still able to draw value from their social network connections. Dunlap (2009) also found that using Chickering and Gamson's (1987) best practices "encouraging contact between students and faculty", Twitter can be utilized to build "just in time" connections between faculty and students.

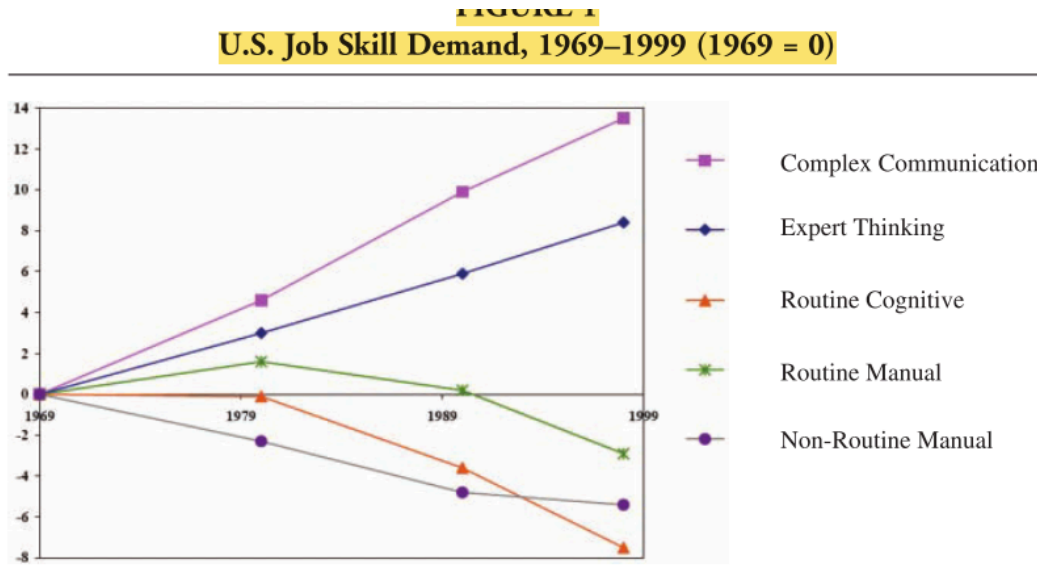
There has been limited but positive reports of using social media in the pre-service teaching curriculum. Becker (2006) found a higher use of technology by pre-service teachers when technology was integrated into the education standards within the pre-service teaching curriculum, as compared to integration in the subject area only. Additionally, Wright (2010) reports a positive experience in teaching practicum and utilizing Twitter as a platform. They indicate that it "honed the reflective thinking skills" of the pre-service teachers in the practicum course.

Need for increased complex communication skills in future workforce

Figure 2.4 shows that not only has social media been shown to have positive potential in the curriculum, but it may serve a role with the increased pressure to produce high school and college graduates with high level mastery in complex communication (Warschauer, 2010). This increase in complex communication and expert thinking can be practiced and assessed through the integration of social media into the curriculum and co-curriculum. For example, Greenhow (2012) has shown that Twitter can be utilized as a literacy practice to develop student communication skills. Toddlers and kindergarteners are even using Twitter to develop literacy

skills (Phillips, 2012; Holland, 2013).

Figure 2.4.



Source: Levy and Murnane (2005; based on data from Autor, Levy, & Murnane, 2003).

Faculty social media use in the curriculum

Institutions of higher education continue to deliver the majority of their Internet-based content via Course Management Systems even though students are increasingly dissatisfied with their effectiveness (Smith et al., 2009). As previous studies have shown, social media is highly used by students and students are increasingly mobile in their access of the Internet. As a result, some faculty are implementing new media into the mainstream of course delivery (Bart, 2010).

The use of social media in higher education and specifically Twitter has changed drastically in recent years. Although faculty are distributed across a wide spectrum of using social media adoption in their personal and professional worlds, there are indications their use is shifting higher. In a recent survey by (Bart, 2010) 35.2% of college faculty use Twitter in some capacity, although many are still not using it with students; and 56.8% expect their Twitter use to

increase. Some of the statements about social media's educational use made by faculty are listed below:

"greatest learning tool since Socrates spoke...No I'm not kidding. The access to industry leaders and educators I have developed is second to none!"

"Twitter has been the most effective, efficient and cheapest professional development I have had in years."

"I would like to incorporate Twitter in the classroom, but not sure how to do it."

"I simply do not have time to learn how to use it correctly. I am sure it might help be a valuable tool, if there was an easier way to learn how to incorporate it into my online course, I might use it." (Bart, 2010). Although these technologies may be intriguing, and students may be using them some faculty researchers feel students should be met where they are (Junco et al., 2011).

Social media and educationally relevant outcomes

There are limited generalizable and well-designed research studies that examine social media and the impacts on college students. Much of the published works are similar to that by Kottner (2010), which is topical in nature and includes best practices, and pragmatic successes and failures, however subjective in nature. Although there are concerns about the generalizability, Morris et al. (2010) found significant correlations between university-based Facebook relationships and persistence. Similar to nearly all of the research regarding social media and student outcomes, this research is correlational in nature, included convenience sampling and could not imply causation. Additionally, Morris et al. (2010) found the concept of social integration, as defined by Tinto (1993), was significantly related to Facebook activity. This concept reaffirms the use of Facebook as a proxy for real life relationships and integration to the social structure of the college environment.

The best way to isolate a variable and its impact is through experimental design. Although survey/observational research is the most common among collegiate assessments (see NSSE, ECAR, CCSSE, etc.), this methodology does not allow for researchers to make causal inferences. The first experimental design research isolating social media's use with college students was conducted in the fall of 2009 (Junco et al. 2012). The experiment utilized 125 first year students enrolled in a first year seminar course. Four sections of the first year seminar utilized Twitter as a common course tool and 3 sections utilized Ning. Ning is a closed social network with features similar to Facebook. With all possible variables held constant among the sections, and accommodating for variances in high school GPA, significant differences in first to second year persistence were found (Junco, Heiberger, & Alonso Garcia, In Review). The control group retention rate of 70% was significantly lower than the experimental group's retention rate of 87%. Experimental design paired with the statistical analysis can allow for the causal implications for the use of this media in the first year seminar for increasing retention. The qualitative analysis revealed detail to this study that was unable to be obtained through the statistical analysis. Students who persisted reported they used online social networks to maintain and enhance their academic and social relationships throughout their first year whereas students who did not persist did not. Those persisting also described a more rich interaction with their faculty. Whether this rich interaction was housed in the intervention or just modeled for the students via the social media experiment and then carried on throughout other faculty interactions is not as easy to parse out. But one thing is clear – the effect of this intervention was much larger than those reported by one of the landmark and foundational student success initiatives: the First Year Seminar. A metastudy showed that first year seminar's having

approximately a 5% average difference in retention whereas the Twitter intervention had an 18% increase (Junco, Heiberger & Alonso Garcia, in review; Fidler, 1991)

Student engagement continues to be a predictor for student learning outcomes, first year grades and retention. Engagement is also widely accepted use as a proxy for these variables in observational research throughout the country. Research by Willekens (2009) found relationships between course management software (CMS) and institutional norms and their impacts on NSSE scores. This was one of the first studies linking technology and NSSE scores. Through multiple measures, the research pointed out the use of these tools increased Student Faculty Interaction (a NSSE factor - SFI). Emerging technologies like chats, blogs, and discussion boards were shown to have the lowest level of impact on student faculty interaction (SFI), while practices such as email have been most effective. Student-to-student interaction has been shown to have a significant impact on learning outcomes, engagement, retention and grades, but this study showed that the technology did not increase this important variable in the student experience (Willekens, 2009).

Social connections are important factors in retention and engagement of college students. More recent research correlates student Facebook use with increased interaction with friends, time spent in student organizations, and feelings of a stronger social life (Heiberger & Harper, 2008). Additionally, the Higher Education Research Institute (HERI) showed connections between social media use and connection to real life friends, number of student organizations involved in and the level of connection to the institution. (Hurtado, 2007).

Research presented by BrckaLorenz & Garver (2010) at the annual Association of Institutional Researcher's conference, analyzed the large national NSSE dataset and specifically looked at the connection between new technologies and 2009 NSSE scores. The national survey

found that most students do not use interactive technologies in their collegiate coursework. Those who did use interactive technologies had large effect sizes for SFI. Analysis from these staffers at the NSSE suggested that first year students use these technologies to increase their interaction with faculty. Additionally, minorities and students with lower grades tend to use these technologies more often than their collegiate peers. Kuh (2009) has stated that the effects of increased engagement for minorities and at risk students has been proven to have a larger impact on their success. This identifies a prime area for future research, especially interactive technologies' ability to increase engagement of at risk and minority students.

Little empirical research has been conducted and published at the K-12 level regarding educational use of social media in the curriculum and co-curriculum. K-12 systems have come out on both sides of the social media spectrum in regards to their policies. One school district asserted: "If a student contacts a staff member using a social media site, the policy states that the employee is not to reply to the message and immediately reject any invitation the student may have sent" (Schuster, 2010). Whereas, the New York City Department of Education created social media guidelines that encourage social media technology's use in teaching with clear rules and guidance (NYC Dept. of Education, 2012). The Los Angeles unified school district recently hired a social media director, which points towards social media's ubiquity in the educational system but its uses and outcomes have yet to be assessed (Quillen, 2012). Other institutions are struggling to define their policy; for example, Chicago State University rescinded a 2-week old policy that required its faculty to obtain permission to use social media (as well as other regulations relating to public media interactions) (Biemiller, 2012). Since teachers are using Twitter from kindergarten through college to engage their constituents (Phillips, 2012; Junco,

Heiberger, & Alonso Garcia, in review), it is important to develop policies that are congruent with the scientific literature.

The research has clearly shown potential for positive outcomes from social media's use in the higher education curriculum and co-curriculum, and additional research is needed to explore the implications for the K-12 system. Most notably Junco, Heiberger and Alonso Garcia (in review) call for further exploration of college students' use of and exposure to social media in the collegiate curriculum and co-curriculum based on student major. This call is voiced because of the positive effects found in their study between social media and student outcomes. Additionally they highlight the need to determine if differences exist in social media exposure and use between majors because if differences exist there may be potential target areas that campuses can focus their efforts. This call aligns well with the research proposed in the subsequent chapters.

The case for social media in K-12

Jenkins (2009) calls on three concerns regarding developing a participatory culture and global workforce: the participation gap, the transparency problem and the ethics challenge. Jenkins' study, funded by the MacArthur foundation, challenges the K-12 education system to address these three areas in order to better prepare our young people for the challenges that await our society.

Jenkins (2009) defines these areas as follows: The Participation Gap is the unequal access to the opportunities, experiences, skills, and knowledge that will prepare youth for full participation in the world of tomorrow. The Transparency Problem deals with the challenges young people face in learning and seeing clearly the ways that media shape perceptions of the world. The Ethics Challenge is the breakdown of traditional forms of professional training and

socialization that might prepare young people for their increasingly public roles as media makers and community participants.

Social media may be a perfect medium to address this set of issues in the K-12 (and subsequently the higher education system). Bruce (2002) believes new technologies including social media can help educators address and overcome these issues:

“Adolescents need to learn how to integrate knowledge from multiple sources, including music, video, online databases, and other media. They need to think critically about information that can be found nearly instantaneously through out the world. They need to participate in the kinds of collaboration that new communication and information technologies enable, but increasingly demand. Considerations of globalization lead us toward the importance of understanding the perspective of others, developing a historical grounding, and seeing the interconnectedness of economic and ecological systems.”

Student engagement, grades, retention and success

Throughout the rise of social media and its eventual ubiquitous use within the US population, multiple research analyses have arisen. Some anecdotal and non-experimental design research has shown some of the downfalls of social media use by students, overuse, and misuse (Kottner, 2010). These negative outcomes have also been shown to exist when students do *anything* other than academic activities. Media and researchers stating social media cause negative effects on students may be a gross overstatement in many cases. Other research has been much more nuanced in the findings regarding social media's impact. Junco (2012) shows that it's about what users *do* on social media that is predictive of the outcomes of student engagement. For example, commenting on social media, and RSVPing to events were positively

predictive of student engagement, whereas, playing games and checking up on friends were found to be negatively predictive of student engagement (Junco et al., 2012).

Social media has become so intertwined in our lives that some employers were recently requesting employee's Facebook passwords (Stern, 2012). It has also become such a distraction that a freelance productivity site recently suggested an app that turns off social media sites on a user's computer as one of the best ways to stay on task (Freelancefolder.com, 2012). This broad spectrum of emerging data about social media in our society directs us to continue this important work to determine the factors that help and hinder advancements in education.

College student success and its ties to social media are of great importance to education at the university and K-12 levels. The ability to utilize new technologies as well as leveraging trends regarding how students spend time socializing and learning about their environment is key to improving educational attainment. One way to predict student success and learning is to measure student involvement or as it has been recently renamed: student engagement (Kuh, Kinzie, Schuh, & Whitt, 2005).

Student involvement theory has and continues to take many forms in the student affairs literature. It was recently readdressed in *Student Success in College* (Kuh et al., 2005) as student engagement. Alexander Astin's theory of college student involvement (Astin, 1984) identified five tenets that can be used to gauge the level of involvement in a particular experience. These tenets are:

1. Involvement Requires Physical and Psychological Energy: This tenet states that "involvement requires the investment of psychological and physical energy" (Pascarella & Terenzini, 2005).

2. Involvement Occurs Along a Continuum: This tenet says that “students will invest varying amounts of energy” in different areas Pascarella and Terenzini (2005).
3. Involvement Has Both Quantitative and Qualitative Features: This point references the fact that students invest various amounts of time in an activity and that student involvement can be measured using qualitative and quantitative measures (Astin, 1984).
4. Development Is Proportional to Quantity and Quality of Involvement: This tenet states that students will develop in proportion to the amount of time spent and nature of their involvement in an activity (Astin, 1984).
5. Educational Effectiveness Is Related to Capacity to Increase Involvement: Astin (1984) states that programs and services should be evaluated in terms of their ability to induce greater student involvement.

In 1987, Chickering and Gamson defined seven principles related to engagement that are key to institutional support of student learning. They include: student-faculty contact, cooperation among students, active learning, prompt feedback, emphasizing time on task, communicating high expectations, and respecting diversity. Kuh (2009) affirmed these practices as effecting student engagement. Kuh et al.’s (2005) work with the National Survey of Student Engagement (NSSE) conceptualized student involvement as engagement. This idea synthesized Astin’s model with factors found in Pascarella and Terenzini’s (2005) meta-analysis of empirical research based best practices in higher education. This synthesis defined engagement by time and effort invested in educationally relevant activities that are linked to common learning outcomes of higher education (Kuh et al., 2005).

The NSSE is a survey of freshman and senior students at thousands of colleges around the country. This survey of educational experiences by students on the NSSE and faculty on the Faculty Survey of Student Engagement (FSSE) has been administered since 2000. Kuh and his associates conducted qualitative focus groups and interviews to tease out best practices in increasing engagement and success. These findings are included in the 2005 work, *Student Success in College*, which furthered Documenting Effective Educational Practices (DEEP) at specific institutions who had significantly higher NSSE scores when compared to their educational peers (Kuh et al., 2005).

The factors of student engagement as defined by the NSSE can be broken down into 4 components of engagement. These are: Student-Faculty Interaction (SFI), Enriching Educational Experience (EEE), Supportive Campus Environment (SCE), and Level of Academic Challenge (LAC). A secondary component of engagement is the analysis of how a university deploys its resources to engage students in these activities (Kuh et al., 2005). Some examples of activities that affect the four components of engagement are:

1. prompt feedback from faculty, discussing readings, assignments or career plans with faculty outside of class (SFI);
2. quality of relationships with faculty, administrators and institutional emphasis on academic and social success (SCE);
3. amount of required reading and writing, memorizing versus application and synthesis of concepts, time spent preparing for class (LAC);
4. serious conversations with students of a different race or ethnicity than your own, participated in practicum, research, internship, service learning, student organizations, etc. (EEE) (Kuh et al., 2005).

These factors are empirically linked to common learning outcomes of higher education institutions. These four components of student engagement also fall in two distinct, but not unconnected realms: in-class and out-of-class engagement.

Student success in the first year

The most thoroughly assessed educational activity on college campuses is the intervention to improve retention. Most commonly among these interventions is the first year seminar. First year seminars have existed on college campuses nearly as long as campuses have existed in the United States. Although there have been lulls in the use of first year seminars, there has been a recent resurgence in their utilization in the past 20 years. Researchers have identified common outcomes of seminars including increased cognitive ability, study skills, student grades, persistence and graduation. These outcomes fall in line with the NSSE concept of engagement (Upcraft, Gardner, & Barefoot, 2005).

Common best practices in first year seminars include increasing SFI, EEE, SCE, and LAC. Components of the Supportive Campus Environment (SCE) measurement are increased with dedicated sections for underprepared students, honors, and transfer or adult students (Upcraft et al., 2005). SCE is also increased through a focus on academic and career advising, study skill development, exploration of campus resources, transition issues, use of undergraduate mentors, and some seminars meeting students where in the residence halls (Upcraft et al., 2005). Enriching Educational Experiences (EEE) in freshman seminars include service learning, exploration of student organizations, study abroad opportunities, signaling undergraduate research or internship opportunities and attendance at campus events. Increases in Student-Faculty Interaction (SFI) come from synchronous and asynchronous communication (Junco et al., 2010), increased contact hours with students, academic and career exploration, and small

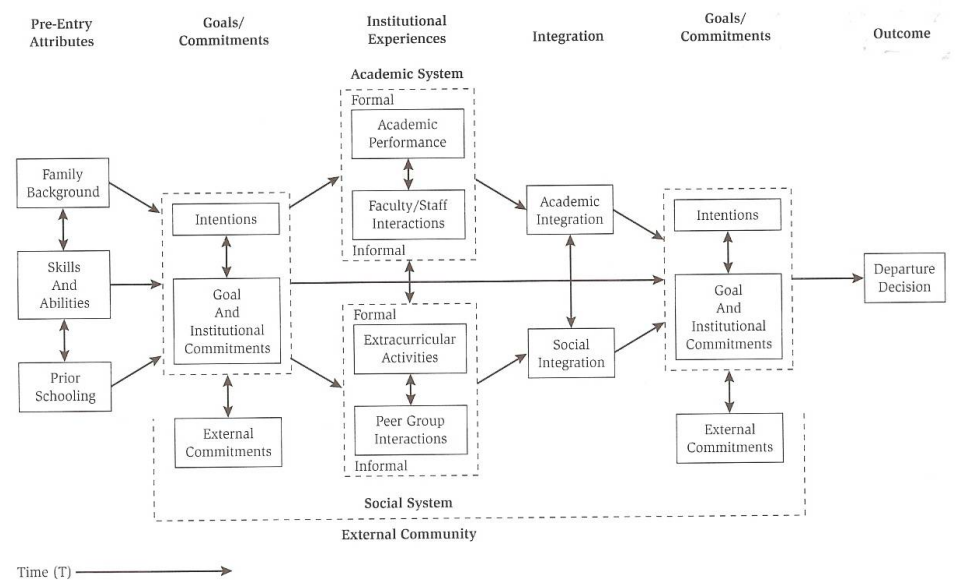
class sizes (<30) (Upcraft et al., 2005). Campuses Level of Academic Challenge (LAC) is shown to increase with inclusion of a common read, a “focus on seminar and continual discussion” (Kuh et al., 2005), a curriculum that parallels the academic curriculum, with extensive reading and writing, and the signaling of diversity (Upcraft et al., 2005).

Persistence and retention

Another highly measured outcome for educational institutions includes persistence or retention. This measure of a student’s continued enrollment from first to second year and beyond is well-researched by Pascarella & Terenzini (2005) and Vincent Tinto (1993). Tinto’s model of institutional departure (Figure 2.5) utilizes the incorporation of students’ commitment to education, their institutional experience, their level of integration and their subsequent commitment to their educational attainment to lead to their departure decision.

Figure 2.5

A longitudinal model of institutional departure.



Source: Tinto, 1993, p. 114. Copyright 1987, 1993 by the University of Chicago. Used by permission.

Berger & Braxton (1998) and Braxton, Sullivan and Johnson (1997) reaffirmed Tinto's model through empirical research showing that social integration and institutional communications predict commitment and subsequently retention (Milem & Berger, 1997). An important component of Tinto's model is that it synergizes well with Kuh's (Kuh et al., 2005) research on DEEP institutions, and Upcraft's (2005) work regarding first year student success. All three of these researcher's focus on common issues in higher education as indicated by Table 1. This table shows the relationship between similar but often differently-termed concepts that these three researchers often focus on in their seminal works regarding student success.

Table 1

NSSE Crosswalk

Kuh (Kuh et al., 2005)	Upcraft (Upcraft et al., 2005)	Tinto (Tinto, 1993)
NSSE (Freshman & Seniors)	First Year Experience	Retention
Level of Academic Challenge (LAC)	Common read, Seminar, Extensive writing and reading, signal diversity	Academic performance
Student-Faculty Interaction (SFI)	Synchronous and Asynchronous communication, Advising, Increased contact hours (+2/wk), Small class size (<30)	SFI
Enriching Educational Experiences (EEE)	Service Learning, Student Organizations, Campus Events, research, interning, study abroad	Extra-curricular Peer Interactions
Supportive Campus Environment (SCE)	Advising, Study Skills, Campus Resources, Transition Issues, Peer Mentoring, Meet where they are (halls, online, etc.).	Academic Performance

Conclusion

The changing student demographics and shifts in who has access to and utilizes technology and social media impact this work as well. For example, Hargattai (2008) indicated that Hispanic students were using social media equal to or less than their collegiate peers whereas Pew (2013) found a shift in use by demographic and that Hispanics are using social media at rates above their collegiate peers. Because the digital divide has and continues to shift in less predictable ways, educators from K-12 through higher education need to be keen on current and potential changes to their student's technology uses and expectations.

Social media can be used for positive impacts within education but little is known about how students are using social media for educational purposes and if differences exist between different groups of students. The subset of college students who plan to teach is great target audience because they may be poised to impact change in the K-12 system and may or may not be exposed to teaching with social media in their college experiences.

CHAPTER 3: METHODS

Research design and rationale

The researcher employed a quantitative design to determine if differences exist in experience, engagement or planned future use of social media in ones intended profession. This design allows for a result that could lead to replication and/or qualitative analysis to clarify and add context to the findings. This study includes quantitative analysis, self-report data and a 19-item NSSE scale to explore if relationships and differences exist in student engagement. If differences exist, this study will set the stage for replication and further qualitative or quantitative data collection and analysis.

Participants and site

The researcher surveyed students from 2 universities in this study. Undergraduates at South Dakota State University and Colorado State University were selected through both stratified and systematic methods of sampling. South Dakota State University, located in Brookings, SD has a “RU/H: high research activity” classification by Carnegie (2013). It is a medium four-year, primarily residential, predominantly undergraduate, selective, doctoral-professional dominant institution, enrolling 12,376 students. Colorado State University, located in Fort Collins, CO has a “RU/VH: very high research activity” classification by Carnegie (2013). It is a large four-year, primarily residential, predominantly undergraduate, selective, doctoral-STEM dominant institution, enrolling 28,902 students.

The researcher sampled all pre-service students and an equivalent number of random students from the general student body, excluding pre-teachers.

Measures

A QuestionPro (Appendix A) was utilized to survey the samples. A professional account with QuestionPro was established and the data was downloaded to an encrypted hard drive only accessible to the researcher. Each university's respective Institutional Review Board (IRB) approved the research protocols and survey instrument (Appendix C). Data was analyzed using SPSS v21.

The measures used include a 19-item engagement scale that uses a subset of the National Survey of Student Engagement questions (with permission – see Appendix B) to determine an engagement score. The full NSSE shows strong psychometric properties, including validity and reliability across thousands of administrations (NSSE, 2012). This 19-item engagement scale was developed and implemented in 4 studies and/or college courses by Junco (2011) and Junco et al. (2010).

Pilot

To pilot the instrument, the researcher recruited 557 undergraduate students majoring in a degree within the Biology & Microbiology Department at South Dakota State University to participate through an introduction email from the researcher. The administration of the instrument yielding 156 responses a 27% response rate.

The researcher checked data for outliers, kurtosis and skewness through frequency analysis, histograms and the calculation of kurtosis and skewness data. All of the scale variables were skewed so non-parametric statistics were used in the analysis. Because of the low response rate from the future K-12 science teachers (n=5), analysis could not be conducted to explore the differences between this population and their collegiate peers.

Measurement Reliability

The Cronbach's α for this pilot administration of the 19-item Junco & Heiberger NSSE scale was 0.77. This is consistent with previous studies (Junco et al., 2012; Junco et al., 2010) which found Cronbach's α 's for this scale of 0.80, 0.75, and 0.81, respectively. Hytten (2010) found a 0.85 and Kuh (2008) reported a 0.82 using a different 19-item scale from the NSSE. The current scale's internal consistency was also similar to the α of 0.85 obtained by Kuh's (2002) 22 college activity items.

Measurement Validity

Evidence was collected to support construct validity of the 19-item engagement scale by correlating the total score on the scale to the number of hours students reported spending in co-curricular activities during an average week. Theoretically, the 19-item scale should correlate with time spent in student activities. This form of convergent validity, resulted in a Pearson's $r = .335, p < 0.001$. Due to the nature of the 19-item scale also measuring curricular engagement, this level of strength is acceptable. This result is consistent with similar analyses conducted by Junco (2012) and Junco & Heiberger (2010).

Additional indices regarding student demographics and student self report use of social media and planned future use of social media are included in the survey. Research is mixed on the accuracy of self-report data regarding social media use (Pew, 2012; Junco, 2013).

Researcher's perspective

The study's author is a research-to-practice administrator who teaches, conducts research and advises in a biology and pre-health professional program. He has a STEM background, began his career as a student affairs practitioner who witnessed first hand the use of Facebook to engage and connect with prospective students prior to their matriculation to the undergraduate

campus. He began researching social media in 2005 for his Master of Science degree and has continued researching, presenting, collaborating, and publishing works regarding social media's relationship to student's success.

Research continues to emerge in the fields of teaching, learning and student development with regards to social media and online social networks. Faculty in K-12 and higher education are continually getting mixed messages about its appropriateness, effectiveness and legality/liability. Thus, this design is aimed to provide some insight into the differences in experiences with social media by major. Most specifically the differences between pre-teaching and non-pre-teaching majors will be analyzed. The pre-teaching majors are like their collegiate peers most likely users of social networking sites as undergraduate students, but also as future professionals in the education space. This study is the first of its kind to provide a glimpse into the differences that may exist in student's experiences with this technology in the curriculum and co-curriculum.

CHAPTER 4: RESULTS

Research questions

- 1: Do differences exist in use, perceptions or attitudes about social media between pre-service teachers and their collegiate peers?
- 2: Is the level of social media use or inspiration from faculty regarding social media use correlated to student's own use of social media for their coursework?
- 3: What medium of social media do pre-service and non-pre-service students prefer for coursework and instructor-student communication?
- 4: Are there differences and associations among pre-service teachers, non-pre-service teachers and their NSSE scores and social media use?

Sampling and Response Rates

The researcher sampled two thousand and fifty six students at two land grant universities and 15% (n=396) of those sampled completed the survey. Table 2 illustrates the responses by institution and response rates.

The researcher randomly selected students at Colorado State University to participate in the study and were sent a solicitation email with information regarding the research project and a link to the survey. All 711 students who, per the student information system, are pursuing program requirements leading to K-12 education (pre-service teachers) and a random sample of 711 non-pre-service teachers undergraduate students were sampled.

The researcher randomly selected students at South Dakota State University to participate in the study and were sent a solicitation email with information regarding the research project and a link to the survey. All 617 students who, per the student information system, are pursuing

program requirements leading to K-12 education (pre-service teachers) and a random sample of 617 non-pre-service teachers undergraduate students were sampled.

Table 2

<i>Samples and response rates</i>	Sample	Responses	Response Rate
Colorado State University Pre-Service	711	113	16%
Colorado State University Non-Pre-Service	711	101	14%
South Dakota State University Pre-Service	617	80	13%
South Dakota State University Non-Pre-Service	617	101	16%
Total	2656	395	15%

The survey respondent's were overrepresented by white students and female students as compared to the overall undergraduate student demographics of the respective institutions. Table 3 illustrates this overrepresentation as well as the high percentage of respondents who had one or more parents who did not attend a college/university. This high percentage of first generation college students is unique among peer high and very high research universities and should be considered when interpreting the results of this study.

Table 3

Respondent Demographics

	CSU respondents	CSU Undergraduate population	SDSU respondents	SDSU Undergraduate population
Male	31%	49%	33%	51%
Female	68.5%	51%	67%	49%
Transgendered	.5%	na	0%	na
White	85%	76%	97%	92%
Alaska Native/Am Indian	.5%	.4%		1.3%
Chinese	2.4%			
Japanese	1.9%			
Hawaiian	.5%	.2%	.6%	<.01%
Asian		1.7%		.8%
Black		2.1%		1%
Multiracial		3%		
Hispanic		9%		1.4%
International		2%		1.6%
Unknown/Other	9%	6%	1.1%	<1%
Korean			1.1%	
Mother didn't attend college	16%		18%	
Father didn't attend college	17%		24%	

(SDSU, 2013; CSU, 2013)

Data analysis

Data were analyzed with SPSS v21.

Table 4 summarizes how each of the research questions were analyzed.

Table 4

Research questions and analysis

Research Question	Statistical Analysis
1. Do differences exist in self-reported use, perceptions or attitudes about social media between pre-service teachers and their collegiate peers?	t-test and Mann-Whitney U
2. Is there a correlation between college student's self-reported use of social media for coursework and their faculty's use of it in the curriculum?	Spearman Rho
3. What medium of social media do pre-service and non-pre-service students prefer for coursework and instructor-student communication?	t-test
4. Are there differences and associations among pre-service teachers, non-pre-service teachers and their NSSE scores and social media use?	t-test and Spearman Rho

1. Do differences exist in self-reported use, perceptions or attitudes about social media between pre-service teachers and their collegiate peers?

1a. Do differences exist between pre-service and non-pre-service students plans to use social media in their career?

The question “To what degree do you plan on using social media in your future profession” was answered by respondents on the following scale: 1) Very Often, 2) Often, 3) Sometimes, 4) Never. The Likert scale data was tested for normality and a skewness of -0.414 was found, thus a parametric analysis could be conducted (Morgan et al., 2011). An independent t-test shows no statistically different mean for pre-service teachers and non-pre-service teachers, $t(390) = 0.323, p = 0.747$. Further inspection of the data indicates that pre-service teachers mean scores ($M = 2.32$) and their collegiate peers ($M = 2.30$). Thus, pre-service teachers and their collegiate peers plan to use social media in their future profession at equivalent rates.

1b. What differences exist, if any, between different college student majors in their exposure to social media in the curriculum?

The data from questions “How often have you been required to use Facebook for college university level coursework”, “How often have you been required to use Twitter for college university level coursework” and “How often have you been required to use other forms of social media for college university level coursework” were found to violate the assumptions of normality (skewness = 2.929, 3.295, 2.928, respectively). This Likert scale included: 1 = “never”, 2 = 1 course, 3 = 2 courses.... 11 = 10 courses. Thus, the Mann-Whitney U was calculated. There was no statistically significant difference between pre-service teachers and non-pre-service teachers for the number of courses required to use “Facebook” or for the number of courses required to use “other forms of social media”. There was a statistically significant difference between pre-service teachers and non-pre-service teachers regarding the number of courses required to use Twitter. The 189 pre-service teachers had higher mean ranks ($M = 204.18$) than the 199 non-pre-service teachers ($M = 185.30$) on the number of courses requiring Twitter, $U = 16,975.5$, $p = 0.002$, $r = 0.159$ which is a small effect size (Morgan, et al. 2011).

1c. What differences exist in perception of faculty efficacy of SM in curriculum?

Likert scale questions with the prompts: “Rate your experience with faculty’s use of the following items in the college curriculum: Facebook, Twitter and Ning (separately).” These three social media were ranked from 1 = very unsatisfied, to 5 = very satisfied. The data were not found to violate the assumptions of normality (skewness = -0.364, -0.447, and -0.542, respectively). Independent t-tests indicated no statistically significant differences between pre-service teachers and non-pre-service teachers.

1d. What differences exist in effect of faculty use of social media?

Data from the question “My faculty’s use of social media has:” 1) Inspired me to use it in my future career, 2) Had no effect on my plans to use it in my future career or 3) Dissuaded me from using it in my future career showed signs of violating the assumptions of normality.

Skewness = -1.325, thus a Mann Whitney U was calculated. The 190 pre-service teachers had lower mean ranks ($M = 184.82$) than the 201 non-pre-service teachers ($M = 206.56$) effect of faculty use of social media, $U = 16,971.5$, $p = 0.002$, $r = 0.157$, which is a small effect size (Morgan, et al. 2011).

1e. What differences exist, if any, in the attitudes of teaching and non-teaching majors regarding the use of social media in the academic curriculum?

The question “I believe social media can be used to enhance the educational environment” was answered by respondents on the following scale: 1) strongly agree, 2) Agree, 3) Neutral, 4) Disagree, 5) Strongly Disagree. The Likert scale data was tested for normality and a skewness of 0.428 was found, thus a parametric analysis could be conducted (Morgan et al., 2011). An independent t-test shows a statistically different mean for pre-service teachers and non-pre-service teachers, $t(390) = 6.077$, $p < 0.001$. Further inspection of the data indicates that pre-service teachers mean scores ($M = 2.25$) were lower than those of their collegiate peers ($M = 2.83$). Thus, pre-service teachers rate the belief that social media can be used to enhance the educational environment at a higher level than their collegiate peers. The effect size of this difference is medium as determined by Cohen’s $d = 0.615$, $r = 0.394$ (Morgan et al., 2011).

If. What differences exist, if any, between pre-service and non-pre-service teachers in their own use of social media for coursework?

A Likert scale was utilized to respond to the question “How often did you use social media out of your own will to complete coursework (set up study groups, communicate about assignments, work on assignments, etc.)” with 1 = never, 2 = 1 course, 3 = 2 courses.... 11 = 10 courses. The data violated the assumptions of normality with a skewness of 1.485. Thus, a Mann Whitney U was used. The 192 pre-service teachers had higher mean ranks ($M = 209.69$) than the 200 non-pre-service teachers ($M = 183.84$) on the number of courses in which they used social media on their own will to complete coursework, $U = 16,667.5$, $p = 0.021$, $r = 0.117$, which is a small effect size (Morgan, et al. 2011).

2. Is there a correlation between college student’s self-reported use of social media for coursework and their faculty’s use of it in the curriculum?

2a. If faculty inspired students did they use it more on own for educational purposes?

Data from the questions “My faculty’s use of social media has” and “how often did you use social media out of your own will to complete coursework (set up study groups, communicate about assignments, work on assignments, etc.)” both violate the assumptions of normality (skewness = -1.325 and -1.485 respectively). Thus the Spearman rho statistic was calculated, $r(387) = -0.150$, $p = 0.003$. The direction of the correlation is negative, indicating that students who are more inspired to use social media on their own will in more classes. Using Cohen’s (1988) guidelines, the effect size is small. The r^2 indicates that approximately 2% of the variance in use of social media on one’s own will in class can be predicted by the faculty member’s inspirational use of social media.

2b. Is there a relationship between being required to use social media for courses and using on own will for coursework?

The data from questions “How often have you been required to use Facebook for college university level coursework”, “How often have you been required to use Twitter for college university level coursework”, “How often have you been required to use other forms of social media for college university level coursework” and “How often did you use social media out of your own will to complete coursework (set up study groups, communicate about assignments, work on assignments, etc.)” were found to violate the assumptions of normality (skewness = 2.929, 3.295, 2.928, 1.485, respectively).

A non-parametric Spearman rho was conducted between Facebook and social media on own will, $r(389) = 0.221, p < 0.001$. The direction of the correlation was positive, indicating that students required to use Facebook for more courses tend to use social media on their own will for coursework more often. Using Cohen’s (1988) guidelines, the effect size is small. The r^2 indicates that approximately 5% of the variance in use of social media on one’s own will in-class can be predicted by the number of times required to use Facebook for coursework.

A non-parametric Spearman rho was conducted between Twitter and social media on own will, $r(386) = 0.130, p = 0.011$. The direction of the correlation is positive, indicating that students required to use Twitter for more courses tend to use social media on their own will for coursework more often. Using Cohen’s (1988) guidelines, the effect size is small. The r^2 indicates that approximately 2% of the variance in use of social media on one’s-own-will in class can be predicted by the number of times required to use Twitter for coursework.

A non-parametric Spearman rho was conducted between using social media other than Twitter and Facebook for coursework and students use of social media on own will, $r(389) =$

0.158, $p = 0.002$. The direction of the correlation is positive, indicating that students required using social media (other than Facebook or Twitter) for more courses tend to use social media on their own will for coursework more often. Using Cohen's (1988) guidelines, the effect size is small. The r^2 indicates that approximately 2% of the variance in use of social media on one's own will in class can be predicted by the number of times required to use social media (other than Facebook or Twitter) for coursework.

3. What medium of social media do pre-service and non-pre-service students prefer for coursework and instructor-student communication?

3a. What differences exist between pre-service teachers and non-pre-service teachers regarding preference of faculty requirements for use of technology for coursework?

The question "I prefer faculty require students to use the following for coursework: a) Online content management (D2L, Blackboard, etc.), b) Facebook, c) Twitter" was responded via a Likert scale of 1 = Strongly Disagree...5=Strongly Agree. The data was found to not violate the assumptions of normality (skewness = 0.757, 0.498, 0.669, respectively) and therefore an independent t-test was used. Table 5 shows that pre-service teachers more strongly prefer faculty require Facebook and Twitter than their non-pre-service peers. Inspection of the two groups means indicates that the average preference decreases throughout the table with LMS ranked higher than Facebook and Facebook higher than Twitter. The pre-service and non-pre-service teachers are also nested within this data, with pre-service teachers indicating more agreeableness to using these social technologies than their non-pre-service teaching peers.

Table 5

Technology preference for coursework

Variable		<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
LMS				0.523	388	0.602	na
	Pre-service	3.92	.961				
	Non-pre-service	3.86	1.134				
Facebook				2.064	389	0.04*	0.209
	Pre-service	2.28	1.053				
	Non-pre-service	2.07	.985				
Twitter				2.42	388	0.016*	0.246
	Pre-service	2.07	.971				
	Non-pre-service	1.84	.940				

3b. What differences between pre-service teachers and non-pre-service teachers exist regarding feeling towards faculty communication methods?

The question “How do you feel about faculty using the following methods to communicate with you as a student: a) Office hours, b) Facebook, c) Twitter, d) Online text chat, e) Video chat” was responded via a Likert scale of 1 = Strongly Disapprove...5=Strongly Approve. The data was found to not violate the assumptions of normality (skewness of -1.09, 0.108, 0.494, -0.317, -0.261, respectively), so an independent t-test was used.

Table 6 shows that pre-service teachers more strongly prefer faculty communicate via Facebook and Twitter than their non-pre-service peers. Inspection of the two group’s means indicates that the average preference decreases throughout the table with students being more approving of office hours over online chat, video chat, Facebook and Twitter; online chat over Facebook and Twitter, and Facebook over Twitter. The pre-service and non-pre-service teachers are also nested within this data, with pre-service teachers indicating more agreeableness to using these social technologies than their non-pre-service teaching peers.

Table 6

Technology communication preference

Variable		<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
Office Hours				0.589	391	0.556	na
	Pre-service	4.47	.670				
	Non-pre-service	4.43	.704				
Online Text Chat				1.318	392	0.188	na
	Pre-service	3.18	1.065				
	Non-pre-service	3.04	1.083				
Video Chat				1.593	389	0.112	na
	Pre-service	3.01	.940				
	Non-pre-service	2.85	1.045				
Facebook				2.136	391	0.033*	0.216
	Pre-service	2.71	1.089				
	Non-pre-service	2.47	1.151				
Twitter				2.734	390	0.007**	0.276
	Pre-service	2.38	1.046				
	Non-pre-service	2.09	1.054				

4. Are there differences and associations among pre-service teachers, non-pre-service teachers and their NSSE scores and social media use?

4a. What differences exist in student engagement between future K-12 educators and other majors?

The 19-item NSSE score as utilized by Junco et al. (2010) and Junco et al. (2012) was calculated by computing the sum of the Likert scores for the 19 NSSE items. This score was then tested for normality with a skewness of -0.052, thus a parametric analysis could be conducted (Morgan et al 2011). An independent t-test shows a statistically different mean for pre-service teachers and non-pre-service teachers, $t(392) = 3.34$, $p = 0.001$. Further inspection of the data indicates that pre-service teachers mean scores ($M = 46.28$) were lower than those of their collegiate peers ($M = 48.90$). This indicates that pre-service teachers are more engaged (based on

this 19 item scale) than their collegiate peers. Although statistically significant the effect is small as determined by Cohen's $d=.337$, $r=.166$ (Morgan et al 2011).

4b. What relationship exists between social media use and student engagement?

Respondents were asked "how many hours you spend in a typical 7-day week on Facebook and on Twitter, separately. This data was then tested for correlation to the 19-item NSSE scale as computed above. The data were checked for normality. The skewness for NSSE scale = -0.052, Facebook = 3.167, Twitter = 4.553. A non-parametric Spearman rho was conducted between Facebook and NSSE, $r(389) = 0.049$, $p = 0.335$. The Spearman rho between Twitter and NSEE, $r(388) = 0.022$, $p = 0.660$. NSSE was not correlated to either Facebook use or Twitter hourly reported use.

A non-parametric Spearman rho was conducted between required Facebook use for college coursework and NSSE, $r(391) = 0.105$, $p = 0.037$. One percent of the variance can be predicted by the required use of Facebook.

A non-parametric Spearman rho was conducted between required social media use for college coursework and NSSE, $r(392) = 0.114$, $p = 0.024$. One percent of the variance can be predicted by the required use of social media.

A non-parametric Spearman Rho was conducted between required Twitter use for college coursework and NSSE, $r(388) = 0.039$, $p = 0.444$. This is not statistically significant.

A non-parametric Spearman rho was conducted between use of social media on own will and NSSE, $r(392) = 0.215$, $p < 0.001$. Five percent of the variance can be predicted by using social media on ones own will for coursework.

DISCUSSION

There are many implications for the results of this study. The findings regarding the hypothesis:

“pre-service teachers are required to use social media less in their curriculum,

use social media less on their own for coursework and plan to use social media less in their future careers in comparison to their collegiate peers. Additionally, because social media use has been positively related to student engagement it is hypothesized that pre-service teachers will also score lower on the engagement scale.” will be addressed.

Pre-service teachers are using social media in educational settings at high levels and more frequently than their collegiate peers with other majors. This may be due to the Personal Learning Networks (PLN) already in use within the culture of K-12 education. This personal and professional development use of social media by current faculty may have translated to their adoption of social media for teaching more easily than other higher education content area.

These findings have implications throughout both the K-12 and higher education ecosystems. Faculty and administrators in both systems may be on the cusp of change and this study may provide an impetus to design policies, systems and curriculum aimed to capitalize on this opportunity.

Required social media use in the curriculum

There was a statistically significant difference between pre-service teachers and non-pre-service teachers regarding the number of courses required to use Twitter. The 189 pre-service teachers reported having a greater number of courses requiring Twitter.

It is not surprising that many faculty have shifted their educational use from Facebook to Twitter. Twitter may seem less invasive and possibly has a larger potential for connection and

consumption of targeted information whereas established social networks like Facebook may allow students to homogenize their socialization. It is also possible that the dissemination of empirical research may be shedding positive light on the use of Twitter as an academic tool. It is also hypothesized that pre-service teaching faculty may be more current on scholarship of teaching and learning research than their collegiate peers and that they are more abreast of education technology research than their collegiate peers.

One of the findings of this study – that pre-service teachers were required to use social media more often for coursework - may indicate the value that pre-service faculty in higher education may place in social media. They may have been using social technologies through Personal Learning Networks throughout the past years and are now translating that use to the classroom more easily than their peers in other disciplines. They are using it in their curriculum even though they know that many of their future graduates may not be able to immediately use it in their own teaching. It is very possible that these faculty are changing the social media culture and beginning a change movement in K-12 by using social media to educate future educators.

Effect of required social media use on inspiring future use

Although there was no difference in satisfaction with faculty's use of social media, pre-service teachers were more "inspired to use social media in their future career" than their collegiate peers. There is not a relationship between satisfaction and inspiration to use social media in their future career. More simply put, faculty may not have to use social media at a higher rate of satisfaction in order to inspire their students to use it in their own teaching. They may just need to show it can be useful. This may indicate that faculty don't have to implement social media use perfectly for students to be inspired to use it in their future profession as K-12 teachers.

Attitudes about social media in education

Pre-service teachers rate the belief that “social media can be used to enhance the educational environment” at a higher level than their collegiate peers. Not only do pre-service teachers plan to use social media often in their teaching, they also believe it can be used to enhance the educational environment. This should be another call to current faculty in pre-service programs and K-12 administrators that there are going to be many new students and teachers entering their systems believing that social media can be an effective educational tool.

Non-required curricular use of social media

Pre-service teachers had higher number of courses in which they used social media on their own will to complete coursework. Pre-service teachers used it on average for nearly 1 more course than their collegiate peers (2.61 courses vs. 1.87 courses, or 40% more). Although, social media were banned in many K-12 systems in the past years, pre-service students were still using social media for coursework at a higher rate than their collegiate peers throughout the university. This indicates that either pre-service faculty are not attune to the disparity in K-12 regulations or they simply find enough value in social media in the curriculum that they use it knowing that their students may not have the opportunity to use it in their job.

Relationship between required use and non-required use

Students required to use Facebook, Twitter or other social media for more courses also use social media on their own will for coursework more often. This finding is important because it indicates that these two variables are related. Whatever the underlying causation of this relationship, faculty and administrators should take note as student trends may be impacting faculty uses, or faculty use may be impacting student use. Either way, there is a relationship between faculty and students and this should not be overlooked when implementing new policies

or faculty development opportunities. New technologies change and adapt quickly and administrators and educators need to be proactive in creating strategies to harness the current and future potential learning tools.

Student preferences of technology mediums for coursework

Table 5 shows that pre-service teachers more strongly prefer faculty require Facebook and Twitter than their non-pre-service peers. Inspection of the two group's means indicates that the average preference decreases throughout the table with LMS ranked higher than Facebook and Facebook higher than Twitter. The pre-service and non-pre-service teachers are also nested within this data, with pre-service teachers indicating more agreeableness to using these social technologies than their non-pre-service teaching peers.

This data suggests that in general pre-service teachers are more agreeable to each technology than their collegiate peers and that students prefer the status quo of the LMS; and although they may be using Twitter more for classes they state they prefer Facebook over Twitter in the curriculum. Pre-service faculty who are not using and teaching with social media should take note as their students are indicating they are more open to using social media in the curriculum than their collegiate peers.

Difference in preferred communication methods

Table 6 shows that pre-service teachers more strongly prefer faculty communicate via Facebook and Twitter than their non-pre-service peers. Inspection of the two groups means indicates that the average preference decreases throughout the table with students being more approving of office hours over online chat, video chat, Facebook and Twitter; online chat over Facebook and Twitter, and Facebook over Twitter. The pre-service and non-pre-service teachers are also nested within this data, with pre-service teachers indicating more agreeableness to using

these social technologies than their non-pre-service teaching peers. Students are more hesitant regarding faculty using a perceived “intrusive” network to communicate out of the curriculum. But they were supportive of both online chats and video chats as means to communicate with their faculty. Faculty and administrators should note this preference and attempt to increase the availability of these forms of communication between their faculty and students.

Engagement

Data indicates that pre-service teachers are more engaged (based on this 19 item scale) than their collegiate peers. Additionally, social media use (as measured by self-report hours) was not correlated with NSSE but the number of times students were required to use social media use for coursework (specifically Facebook) is positively correlated with higher NSSE scores. Also, students who use social media more for education on their own will for coursework have higher NSSE scores.

These results indicate that pre-service faculty require social media’s use more in the curriculum and their students are more engaged (as measured by this subset of NSSE). This finding is important not only for pre-service faculty, but also their collegiate peers in other departments. NSSE is also correlated to required social media use and use of social media on the students own volition. This could be most important for those outside of pre-service teaching: these students are less engaged and because there is a positive relationship between social media and this NSSE scale – faculty may want to consider how they are engaging students both in person and in the digital space. Faculty should ask themselves if they are modeling positive professional and social interaction both physically and digitally.

Planned use in the future profession

Pre-service teachers and their collegiate peers plan to use social media in their future

profession at equivalent rates. Both indicated they plan to use it “often” on the scale “Very often”, “often”, “sometimes” and “never”. This is important to note as social media has been widely utilized in non-educational professions (marketing, news reporting, business, etc.) but is currently used more sporadically by K-12 and higher education faculty. Current K-12 administrators and current pre-service faculty should take notice as this finding indicates a plan by pre-service teachers to implement social media into their future teaching in the K-12 system even though many systems may ban its use. This finding, in conjunction with many research studies showing the positive potential of social media in education, may be an impetus for school boards and administrators to re-evaluate their policies.

Conclusion

Although, the original hypothesis: “pre-service teachers are required to use social media less in their curriculum, use social media less on their own for coursework and plan to use social media less in their future careers in comparison to their collegiate peers. Additionally, because social media use has been positively related to student engagement it is hypothesized that pre-service teachers will also score lower on the engagement scale.” was incorrect, there are many implications of this study for higher education and K-12 faculty, staff and administrators.

Pre-service teachers who completed this survey at SDSU and CSU have been required to use social media in the curriculum, utilize social media on their own, and have been inspired by their faculty’s use of social media more than their collegiate peers. They also have a stronger belief that social media can be used enhance the educational environment than their non-pre-service peers. Additionally, pre-service teachers also plan to use social media “often” in their careers as K-12 teachers. There was a positive correlation between “required use of social media in the

curriculum” and the engagement scale, and an even stronger effect between “using social media on ones own will for coursework” and the engagement scale. Finally, pre-service teachers used social media in education more often and had higher engagement scores.

Not only are there differences between the two groups of students analyzed –but significant relationships between variables emerged. There are positive correlations between required use of social media by faculty and students own social media use for educational purposes. The data indicate that there is also a positive relationship between the feeling of inspiration students felt about their faculty’s use and their own use of social media. This is exciting because it hints at the possibility of causation: could faculty’s requirements and modeling social media use in the curriculum be causing students to use this technology on their own?

Pre-service teachers are also more open than their collegiate peers when it comes to their preferred method of communication and their preferred platforms for curriculum. Pre-service teachers prefer social media at higher rates than their collegiate peers for these activities.

Pre-service teachers may not be representative of the current higher education student body (i.e. they represent about 2% of the student body at Colorado State University) but their social media and other technology tendencies and preferences may be indicating the impact they will soon have on K-12 students. Additionally, these findings may foreshadow the experiences and expectations of students that will soon enroll in higher education will have regarding social media in their higher education experience.

Finally, pre-service teachers are using social media more than their collegiate peers for educational purposes. They see social media’s value in the educational process and many won’t be able to use it because of the restrictive rules or culture that exists within many K-12 systems.

This is a lost opportunity for student learning, engagement, professional development, identity development, literacy building, and modeling of professional behavior in online spaces by K-12 educators. This dissertation provides an argument for:

1. All faculty to consider the benefits of social media's use in their teaching;
2. Reform in K-12 administrative regulations and school culture regarding social media's use in the curriculum.

Implications

The change created by college and university faculty in pre-service programs impact future K-12 teachers, who then teach K-12 students and this chain continues eventually to students enrolling in higher education. The students they teach affect change in the K-12 system, which then affects the students in the higher education system. Education administrators and college faculty must be keen to this cycle of K-12 to higher education change that is already underway regarding social media use. More pre-service teachers are exposed to, and have positive experiences and perceptions with social media in education. This study indicates that, if they can, they will use it with K-12 students. Their students will then be coming to the university having had positive educational experiences with social media. This next generation of K-12 student may even have expectations of social media use in the curriculum.

College faculty who teach outside of pre-service education areas also should be attune to this change because shortly students in college and university settings may be asking for or expecting this integration of social media in the educational environment. These non-pre-service students are also less engaged and utilizing social media in the curriculum may be a great way to increase that engagement.

The combination of social media and undergraduate student demographic shifts in higher education is on the horizon. An increase in students of diverse backgrounds will be attending institutions of higher education in the next 20 years. Demographic shifts, in conjunction with the result of this study's findings are a combination that must not be overlooked. More incoming college students will be high end users of social media and their high school instructors have a higher likelihood they will be using or will want to be using social media in their teaching. Thus, K-12 and higher education have multiple indicators pointing to the fact that teachers and faculty should be leveraging social media for teaching and learning. If educators don't model positive uses of social media, it is likely students will experiment on their own without proper mentorship and guidance.

Future research

Additional research should be conducted regarding social media and its correlation with student engagement. This study found differing relationships between social media and engagement. Results that were dependent upon self-report across three different ways students interact with social media: (1) hours spent actively using; (2) required use for coursework; and (3) use on one's own will for coursework. Additional research should be conducted differentiating the relationships between these areas of social media use and student engagement and/or other student outcomes.

Another perspective that is important in analyzing educational systems is the faculty and administrator's usage of social media and their perspective on the efficacy of social media in education. Further research should be conducted analyzing how higher education and K-12 faculty and administrators use social media in the curriculum and co-curriculum, which platforms they use, what the learning outcomes are from its use. Exploring the causal role of

faculty's use would provide insight into whether there is correlation or causation between how faculty use social media and whether it causes students to be inspired by their use.

Where this study relied on self-report data, confirming the validity of this means of data collection should also be conducted. Measuring actual student use and time spent in various activities would add to the reliability of these findings. Although this becomes difficult regarding tracking engagement data, tracking and measuring actual social media usage and analyzing syllabi of both pre-service teachers and their collegiate peers is a potential method for data collection.

Students who were required to use Facebook, Twitter or other social media for more courses also use social media on their own will for coursework more often. This finding is important because it indicates that these two variables are related. This relationship may be causational and further research should be conducted to determine causation and its effects.

REFERENCES

- Astin, A.W. (1984). Student Involvement: A Developmental Theory for Higher Education. *Journal of College Student Personnel*, 25, 297-308.
- Bachrach, Y., Kosinski, M., Graepel, T., Kohli, P., & Stillwell, D. (2012). Personality and patterns of Facebook usage. *Proceedings of the 3rd Annual ACM Web Science Conference on - WebSci '12*, 24–32. doi:10.1145/2380718.2380722
- Bart, M. (2010). Twitter in Higher Education 2010: Usage Habits and Trends of Today's College Faculty. <http://www.facultyfocus.com>
- Becker, J. (2006). Digital equity in education: A Multilevel examination of differences in and relationships between computer access, computer use and state-level technology policies. *Education Policy analysis archives*, 15(3), 1–36. Retrieved from <http://www.eric.ed.gov/ERICWebPortal/recordDetail?accno=EJ800820>
- Berger, J., Braxton, J. (1998). Revising Tinto's interactionalist theory of student departure through theory elaboration: Examining the role of organizational attributes in the persistence process. *Research in Higher Education*, 39(2).
- Brenner (2013). Pew Internet: Social Networking (Full detail). *Pew Internet and American Life Project*. Retrieved from: <http://pewinternet.org/Commentary/2012/March/Pew-Internet-Social-Networking-full-detail.aspx>
- Braxton, J.M., Sullivan, A.V.S., and Johnson, R. M., Jr. . (1997). *Appraising Tinto's Theory of College Student Departure*. New York: Agathon Press.
- Broderick, R. & Grinberg, E. (2013). 10 people who learned social media can get you fired. *CNN Living*. Retrieved from: <http://www.cnn.com/2013/06/06/living/buzzfeed-social-media-fired>
- Bruce, B. (2002). "Diversity and Critical Social Engagement: How Changing Technologies Enable New Modes of Literacy in Changing Circumstances." In *Adolescents and Literacies in a Digital World*, ed. D.E. Alvermann. New York: Peter Lang.
- Burke, M., & Kraut, R. (2011). Social Capital on Facebook : Differentiating Uses and Users. *Proceedings of the CHI '11 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. p. 571-580. ACM. New York, NY. doi>10.1145/1978942.1979023
- Burke, M., Marlow, C., & Lento, T. (2010). Social network activity and social well-being. *Proceedings of the 28th international conference on Human factors in computing systems - CHI '10*, 1909. doi:10.1145/1753326.1753613
- Carnegie (2013). Carnegie Classifications - Lookup & Listings. *Carnegie Foundation for the Advancement of Teaching*. Retrieved from: http://classifications.carnegiefoundation.org/lookup_listings/srp.php?clq=%7B%22basic2005_ids%22%3A%2216%22%7D&start_page=standard.php&backurl=standard.php&limit=0,50
- Cho, H., Gay, G., Davidson, B., & Ingraffea, a. (2007). Social networks, communication styles, and learning performance in a CSCL community. *Computers & Education*, 49(2), 309–329. doi:10.1016/j.compedu.2005.07.003
- Correa, T., Hinsley, A. W., & de Zúñiga, H. G. (2010). Who interacts on the Web?: The intersection of users' personality and social media use. *Computers in Human Behavior*, 26(2), 247–253. doi:10.1016/j.chb.2009.09.003

- CSU (2013). Colorado State University Factbook. Institutional Research. Found at: http://www.ir.colostate.edu/pdf/fbk/1213/2012_13_Fact_Book_Students.pdf
- Dahlstrom, E. (2012). ECAR Study of Undergraduate Students and Information Technology, 2012 (Research Report). Louisville, CO: EDUCAUSE Center for Applied Research, September 2012, available from <http://www.educause.edu/ecar>.
- Dunlap, J. C., & Lowenthal, P. R. (2009). Tweeting the Night Away : Using Twitter to Enhance Social Presence. *Journal of Information Systems*, 20(2), 129–135.
- Fidler, P. P. (1991). Relationship of freshman orientation seminars to sophomore return rates. *Journal of the Freshman Year Experience*, 3(1), 7-39.
- Frazier, L. (2013). Forest Grove School District social media policy questioned after principal's Twitter prompts complaint. *The Oregonian*. http://www.oregonlive.com/forest-grove/index.ssf/2013/06/post_24.html
- Gahran, A. (2013). Who isn't using a smartphone yet? *Knight Digital Media Center*. Retrieved from: <http://www.knightdigitalmediacenter.org/news/2013/06/who-isnt-using-smartphone-yet>
- Gao, F., Luo, T., & Zhang, K. (2012). Tweeting for learning: A critical analysis of research on microblogging in education published in 2008-2011. *British Journal of Educational Technology*, 43(5), 783–801. doi:10.1111/j.1467-8535.2012.01357.x
- Gonzales, A. L., & Hancock, J. T. (2011). Mirror, Mirror on my Facebook Wall: Effects of Exposure to Facebook on Self-Esteem. *Cyberpsychology, behavior and social networking*, 14(1-2), 79–83. doi:10.1089/cyber.2009.0411
- Gosling, S. D., Augustine, A. a, Vazire, S., Holtzman, N., & Gaddis, S. (2011). Manifestations of personality in Online Social Networks: self-reported Facebook-related behaviors and observable profile information. *Cyberpsychology, behavior and social networking*, 14(9), 483–8. doi:10.1089/cyber.2010.0087
- Greenhow, C., & Gleason, B. (2012). Twitteracy: Tweeting as a New Literacy Practice. *The Educational Forum*, 76(4), 464–478. doi:10.1080/00131725.2012.709032
- Harper, R., Lewis, J., & Heiberger, G. (In Review). Microaggressions in online environments. *Journal of Student Affairs Research and Practice*.
- Headlee, C. (2012). Tell me more. *National Public Radio*. Retrieved from: <http://www.npr.org/2012/11/19/165482374/post-election-racist-tweets-raise-questions>
- Heiberger, G., & Harper, R. (2008). Have you facebooked Astin lately? Using technology to increase student involvement. *New Directions for Student Services*(124), 19-35. doi: 10.1002/ss.293
- Heiberger, G., & Junco, R. (2011). Meet your students where they are: Social Media. *Thriving in Academe* (National Education Association).
- Heick, T. (2013). The Complete Guide to Twitter hashtags for Education. Retrieved from: <http://www.teachthought.com/twitter-hashtags-for-teacher/>
- Holland, B. (2013). Teaching Toddlers to Tweet? Introducing Social Media to Elementary Students. *Edutopia*. Retrieved from: <http://www.edutopia.org/blog/introducing-social-media-lower-elementary-beth-holland>
- Hurtado, S. (2007). College freshman and online social networking sites. *Higher Education Research Institute*. Retrieved from: <http://www.gseis.ucla.edu/heri/PDFs/pubs/briefs/brief-091107-SocialNetworking.pdf>
- Jenkins, H. (2009). Confronting the Challenges of Participatory Culture : Media Education for the 21 Century. *Program*. MIT Press

- Johnson, K. A. (2011). The effect of Twitter posts on students' perceptions of instructor credibility. *Learning, Media and Technology*, 36(1), 21–38. Retrieved from <http://www.informaworld.com/index/935339874.pdf>
- Junco, R. (2013). [Comparing actual and self-reported measures of Facebook use](#). *Computers in Human Behavior*, 29(3), 626-631. doi: 10.1016/j.chb.2012.11.007
- Junco, R. (2013). Inequalities in Facebook use. *Computers in Human Behavior*. 29(6). <http://dx.doi.org/10.1016/j.chb.2013.05.005>
- Junco, R., & Cotten, S.R. (2011). Perceived Academic Effects of Instant Messaging Use. *Computers & Education*, 56(2), 370-378.
- Junco, R., Elavsky, C.M., & Heiberger, G. (2012). Putting Twitter to the test: Assessing outcomes for student collaboration, engagement and success. *British Journal of Educational Technology*, no-no. doi: 10.1111/j.1467-8535.2012.01284.x
- Junco, R., Heiberger, G., & Alonso Garcia, N. (In Review). Tweeting to stay: Fostering academic and social integration through Twitter. *Educational Researcher*.
- Junco, R., Heiberger, G., & Loken, E. (2010). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, no-no. doi: 10.1111/j.1365-2729.2010.00387.x
- Junco, R., & Mastrodicasa, J. (2007). *Connecting to the Net.Generation*. Washington, D.C.: National Association of Student Personnel Administrators.
- Henry, K.S. (2010). Extending Our Understanding of Social Belonging: College Students' Use of Technology, Psychosocial Well-Being, and Sense of Community in University Life. ERIC Dissertation archive. Retrieved from: <http://eric.ed.gov/?id=ED519224>
- Kirschner, P & Karpinski, A. (2010). Facebook® and academic performance, *Computers in Human Behavior*, 26(6) p.1237-1245. <http://dx.doi.org/10.1016/j.chb.2010.03.024>.
- Kuh, G.D. (2009). What Student Affairs Professionals Need to Know About Student Engagement. *Journal of College Student Development*, 50(6), 24.
- Kuh, G.D., Kinzie, J., Schuh, J.H., & Whitt, E.J. (2005). *Student Success in College: Creating Conditions That Matter*. San Francisco:: Jossey-Bass.
- Kuh, G. D., Cruce, T. M., Shoup, R., Kinzie, J., & Gonyea, R. M. (2008). Unmasking the Effects of Student Engagement on First-Year College Grades and Persistence. *The Journal of Higher Education*, 79(5), 540–563.
- Lei, J. (2010). Quantity versus quality: A new approach to examine the relationship between technology use and student outcomes. *British Journal of Educational Technology*, 41(3), 455–472. doi:10.1111/j.1467-8535.2009.00961.x
- Milem, J.F., & Berger, J.B. (1997) (Vol. 38, pp. 387-400).
- Moran, M., & Tinti-kane, H. (2012). How today's higher education faculty use social media. Pearson Learning Solutions.
- Morris, J., Reese, J., Beck, R., Mattis, C. (2010). Facebook Usage as a Predictor of Retention at a Private 4-Year Institution. *Journal of College Student Retention: Research, Theory & Practice*, v11 n3 p311-322 2009-2010.
- NSSE. (2012). NSSE's Psychometric Portfolio. Retrieved March 22, 2012, from <http://nsse.iub.edu/?cid=154>
- Pascarella, E.T., & Terenzini, P.T. (2005). *How College Affects Students*. San Francisco: Jossey-Bass.
- SDSU (2013). South Dakota State University Factbook. Institutional Research. Retrieved from: <http://sdstate.edu/about/institutional-research/upload/FY2012-SDSU-Factbook.pdf>

- Seaman, J. & Tinti-Kane, H. (2013). Social Media for Teaching and Learning. Pearson.
Retrieved from: <http://www.pearsonlearningsolutions.com/assets/downloads/reports/social-media-for-teaching-and-learning-2013-report.pdf#view=FitH,0>
- Seidman, G. (2012). Self-presentation and belonging on Facebook: How personality influences social media use and motivations. *Personality and Individual Differences*.
doi:10.1016/j.paid.2012.10.009
- Shapley, K. S., Sheehan, D., Maloney, C., & Caranikas-Walker, F. (2010). Evaluating the implementation fidelity of technology immersion and its relationship with student achievement. *The Journal of Technology, Learning and Assessment*, 9(4). Retrieved from <http://ejournals.bc.edu/ojs/index.php/jtla/article/view/1610>
- Smith, S.D., Salaway, G., Caruso, J.B., & Wisconsin–Madison, U.o. (2009). The ECAR Study of Undergraduate Students and Information Technology (Vol. 6).
- Tinto, V. (1993). *Leaving College: Rethinking the Causes and Cures of Student Attrition*. Chicago: University of Chicago Press.
- Upcraft, M.L., Gardner, J.N., & Barefoot, B.O. (2005). *Challenging and Supporting the First-Year Student: A handbook for improving the First Year of College*. San Francisco: Jossey-Bass.
- Warschauer, M., & Matuchniak, T. (2010). New Technology and Digital Worlds: Analyzing Evidence of Equity in Access, Use, and Outcomes. *Review of Research in Education*, 34(1), 179–255. doi:10.3102/0091732X09349791
- Warner, J. & Mercer, T. (2013). An increase in High School Graduates Predicted for South Dakota. *South Dakota Board of Regents*. Retrieved from:
<http://sdbor.edu/mediapubs/pressreleases/documents/051513HSgraduateProjection.pdf>
- Warren, C. (2011). 10 people who have lost their jobs over social media mistakes. *Mashable*. Retrieved from: <http://mashable.com/2011/06/16/weinergate-social-media-job-loss/>
- Wikipedia Social Media. (2012, June 11, 2012). Retrieved May 5, 2012, from
http://en.wikipedia.org/wiki/Social_media
- Wright, N. (2010). Twittering in teacher education: reflecting on practicum experiences. *Open Learning: The Journal of Open and Distance Learning*, 25(3), 259–265.
doi:10.1080/02680513.2010.512102
- Wohn, Y., Ellison, N., Kahn, M., Fewins-Bliss, R. & Gray, R. (2013) The role of social media in shaping first-generation high school students' college aspirations: A social capital lens. *Computers & Education*, V63, p. 424–436.
- Yu, A. Y., Tian, S. W., Vogel, D., & Chi-Wai Kwok, R. (2010). Can learning be virtually boosted? An investigation of online social networking impacts. *Computers & Education*, 55(4), 1494–1503. doi:10.1016/j.compedu.2010.06.015
- Zywica, J., & Danowski, J. (2008). The Faces of Facebookers: Investigating Social Enhancement and Social Compensation Hypotheses; Predicting Facebook™ and Offline Popularity from Sociability and Self-Esteem, and Mapping the Meanings of Popularity with Semantic Networks. *Journal of Computer-Mediated Communication*, 14(1), 1–34.
doi:10.1111/j.1083-6101.2008.01429.x

APPENDIX A (SURVEY INSTRUMENT)

Introduction: You have been selected to participate in a research study analyzing social media in higher education.

Participation in the Study: The survey consists of 14 demographic questions and 43 rank style questions. For complete participation you are asked to answer each question to the best of your ability. The survey will take approximately 10 minutes to complete.

Risks: Your name will not appear on the survey. All information on the survey will be kept strictly confidential. Data will only be shared in aggregate (total) form so that it can not be traceable to any individual.

Benefits: The results of this study will be utilized to understand and inform best practices in new technology's use in higher education.

Confidentiality: The information in the study records will be kept confidential. Data will be stored securely and will be made available only to persons conducting the study. No reference will be made in oral or written reports that could link your identifying information to the data.

Contact Information: If you have any questions about your rights as a volunteer in this research, contact Janell Barker, Human Research Administrator at 970-491-1655.

Participation: Your participation in this study is voluntary. You may decline to participate without penalty. If you decide to participate, you may withdraw from the study at anytime without penalty.

Participation Incentive: There is no incentive to participate

Consent: By completing this survey you consent to participate in this research project.

In your experiences at your current college/university during the current school year, how often have you done each of the following?

	Very Often	Often	Sometimes	Never
Asked questions in class or contributed to class discussions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Participated in a community-based project (e.g. service learning) as apart of a regular course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Used an electronic medium (listerv, chat group, internet, instant messaging, etc.) to discuss or complete an assignment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussed grades or assignments with an instructor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Talked about career plans with a faculty member or advisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussed ideas from your readings or classes with faculty members outside of class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worked with faculty members on activities other than coursework (committees, orientation, student life activities, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Had serious conversations with students of a different race or ethnicity than your own	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Had serious conversations with students who are very different from you in terms of their religious beliefs, political opinions or personal values	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

During the current school year, about how often have you done each of the following?

	Very Often	Often	Sometimes	Never
Attended an art exhibit, play, dance, music, theater, or other performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exercised or participated in physical fitness activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Participated in activities to enhance your spirituality (worship, meditation, prayer, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tried to better understand someone else's views by imagining how an issue looks from his or her perspective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Mark the response that best represents the quality of your relationships with people at your

college or university.

	Unfriendly	Unsupportive	Unhelpful	Friendly	Supportive	Helpful
Relationships with other students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Relationships with faculty members	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Relationships with administrative personnel and offices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

To what extent does your college/university emphasize attending campus events and activities (special speakers, cultural performances, athletic events, etc.)

	Very much	Quite a bit	Some	Very little
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How would you evaluate your entire educational experience at this institution?

	Excellent	Good	Fair	Poor
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

About how many hours do you spend in a typical 7-day week doing each of the following?

Preparing for class (studying, reading, writing, doing homework or lab work, analyzing data, rehearsing, and other academic activities)
Participating in co-curricular activities (organizations, campus publications, student government, fraternity or sorority, intercollegiate or intramural sports, etc.)
Actively using Facebook
Actively using Twitter
Sending text messages

Have you done or plan to do community service or volunteer work before you graduate from your college/university?

1. Done
2. Plan to do
3. Do not plan to do
4. Have not decided

How often have you been required to use social media (Facebook, Twitter, Ning, etc.) for college/university level coursework?

1. Never
2. 1 course
3. 2 courses
4. 3 courses
5. 4 courses
6. 5 courses
7. 6 courses
8. 7 courses
9. 8 courses
10. 9 courses
11. 10 or more courses

How often did you use social media out of your own will to complete coursework (set up study groups, communicate about assignments, work on assignments, etc.)

1. Very often
2. Often
3. Sometimes
4. Never

You have indicated you used social media as a part of a college/university level coursework. What media have you used?

1. Facebook
2. Twitter
3. Ning
4. Linked-in
5. Blog
6. In-house University built social network
7. Other

Rate your experience with faculty's use of the following items in the college curriculum:

	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied	N/A
Facebook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Twitter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How do you feel about faculty using the following methods to communicate with you as a student:

	Strongly Disapprove	Disapprove	Neutral	Approve	Strongly Approve
Office hours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Facebook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Twitter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online text chat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Video chat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I prefer faculty require students to use the following for coursework:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Online content management system (D2L, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Facebook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Twitter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

To what degree do you plan on using social media in your future profession?

1. Very Often
2. Often
3. Sometimes
4. Never

My faculty's use of social media has:

1. Inspired me to use it in my future career
2. Left me ambivalent about using social media in my career
3. Dissuaded me from using it in my future career

I believe social media can be used to enhance the education environment.

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree

Current Age

What is your ethnic background?

1. African American / Black
2. Indian / American Indian
3. Asian American / Asian
4. Hispanic / Latino / Mexican / Puerto Rican
5. White / Caucasian
6. Other

What is your current academic major or program of study?

How many college/university credits will you have completed as of May 10th, 2012?

Are you currently enrolled in an education track that is preparing you for teaching in the K-12 system?

1. Yes
2. No

What is your current cumulative college/university GPA?

What was your high school average or grade point average upon graduation?

What was your composite ACT score?

Upon admittance to this college / university, I entered as a:

1. Traditional admitted
2. Division 1 Athlete
3. Honors
4. Veteran
5. Returning/readmitted student
6. Other

While in college, I live:

1. on campus (residence hall, town house, apartment, etc.)
2. off campus apartment
3. at home/my permanent address
4. Other

How many miles from home is this college from your permanent home?

1. 5 or less
2. 6-10
3. 11-50
4. 51-100
5. 101-500
6. Over 500

Using your best estimate, what was your household total income during 2011? (for most students this includes your parents/guardians if they claim you as a dependent)

1. Less than \$20,000
2. \$20,000 to \$39,999
3. \$40,000 to \$59,999
4. \$60,000 to \$79,999
5. \$80,000 to \$99,999
6. \$100,000 or more
7. Other

What is the highest level of formal education obtained by your father?

1. No College
2. Some College
3. Certificate Only
4. Associate Degree
5. Bachelor's Degree

6. Some graduate school
7. Master's degree
8. Doctorate degree
9. Other terminal degree (M.D., J.D., D.O., D.D.S., D.V.M.)
10. Other

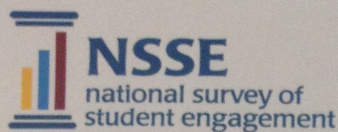
What is the highest level of formal education obtained by your mother?

1. No College
2. Some College
3. Certificate Only
4. Associate Degree
5. Bachelor's Degree
6. Some graduate school
7. Master's degree
8. Doctorate degree
9. Other terminal degree (M.D., J.D., D.O., D.D.S., D.V.M.)
10. Other

What is your gender?

1. Male
2. Female
3. Transgendered

APPENDIX B (NSSE AGREEMENT)



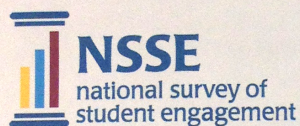
The College Student Report Item Usage Agreement

The National Survey of Student Engagement's (NSSE) survey instrument, *The College Student Report*, is copyrighted and the copyright is owned by The Trustees of Indiana University. Any use of survey items contained within *The College Student Report* is prohibited without prior written permission from Indiana University. When fully executed, this Agreement constitutes written permission from the University, on behalf of NSSE, for the party named below to use an item or items from *The College Student Report* in accordance with the terms of this Agreement.

In consideration of the mutual promises below, the parties hereby agree as follows:

- 1) The University hereby grants **Greg Heiberger** ("Licensee") a nonexclusive, worldwide, irrevocable license to use, reproduce, distribute, publicly display and perform, and create derivatives from, in all media now known or hereafter developed, the item(s) listed in the proposal attached as Exhibit A, solely for the purpose of including such item(s) in the survey activity described in Exhibit A, which is incorporated by reference into this Agreement. This license does not include any right to sublicense others. This license only covers the survey instrument, time frame, population, and other terms described in Exhibit A. Any different or repeated use of the item(s) shall require an additional license.
- 2) In exchange for the license granted in section 1, Licensee agrees:
 - a) there will be no licensing fee to use NSSE items for the purposes described in Exhibit A;
 - b) to provide to NSSE frequency distributions and means on the licensed item(s);
 - c) on the survey form itself, and in all publications or presentations of data obtained through the licensed item(s), to include the following citation: "Items xx and xx used with permission from *The College Student Report*, National Survey of Student Engagement, Copyright 2001-13 The Trustees of Indiana University";
 - d) to provide to NSSE a copy of any derivatives of, or alterations to, the item(s) that Licensee makes for the purpose of Licensee's survey ("modified items"), for NSSE's own nonprofit, educational purposes, which shall include the use of the modified items in *The College Student Report* or any other survey instruments, reports, or other educational or professional materials that NSSE may develop or use in the future. Licensee hereby grants the University a nonexclusive, worldwide, irrevocable, royalty-free license to use, reproduce, distribute, create derivatives from, and publicly display and perform the modified items, in any media now known or hereafter developed; and
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3) This Agreement expires on February 28, 2013.

The undersigned hereby consent to the terms of this Agreement and confirm that they have all necessary authority to enter into this Agreement.

For The Trustees of Indiana University:

[Redacted Signature]

Alexander C. McCormick
Director
National Survey of Student Engagement

2/27/2012
Date

For Licensee:

[Redacted Signature]

Greg Heiberger
Graduate Student
Colorado State University

3/15/12
Date

[Redacted Signature]

James Folkestad, PhD
Dissertation Advisor
Colorado State University

3-5-2012
Date

APPENDIX C (IRB APPROVALS)



Research Integrity & Compliance Review Office
Office of Vice President for Research
Fort Collins, CO 80523-2011
(970) 491-1553
FAX (970) 491-2293

DATE: February 8, 2012

TO: James Folkestad, Education
Greg Heiberger, Education



FROM: Janell Barker, IRB Administrator
Research Integrity & Compliance Review Office

TITLE: Perceived Efficacy of Social Media Platforms in Enhancing Student
Engagement, Grades & Persistence

IRB ID: 014-13H

Review Date: February 8, 2012

The Institutional Review Board (IRB) Administrator has reviewed this project and has declared the study exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b)(2): Research involving the use of educational tests,....survey procedures, interview procedures or observation of public behavior, unless: a) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects.

The IRB determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as proposed in the Exempt application**, including obtaining and documenting (signed) informed consent if stated in your application or if required by the IRB.
- **Any modification of this research should be submitted to the IRB through an email to the IRB Administrator, prior to implementing any changes**, to determine if the project still meets the Federal criteria for exemption. If it is determined that exemption is no longer warranted, then an IRB proposal will need to be submitted and approved before proceeding with data collection.
- **Please notify the IRB if any problems or complaints of the research occur.**

Please note that you must submit all research involving human participants for review by the IRB. **Only the IRB may make the determination of exemption**, even if you conduct a similar study in the future.



Research Integrity & Compliance Review Office
Office of Vice President for Research
Fort Collins, CO 80523-2011
(970) 491-1553
FAX (970) 491-2293

Date: January 24, 2013

To: James Folkestad, Education
Greg Heiberger, Education



From: Janell Barker, IRB Coordinator

Re: Experiences with Social Media in the Collegiate Curriculum and
Co-Curriculum: Connections to K-12

IRB ID: 010-14H

Review Date: January 24, 2013

The Institutional Review Board (IRB) Coordinator has reviewed this project and has declared the study exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b)(2): Research involving the use of educational tests, survey procedures, interview procedures or observation of public behavior, unless: a) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects.

The IRB determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as proposed in the Exempt application**, including obtaining and documenting (signed) informed consent if stated in your application.
- **Any modification of this research should be submitted to the IRB Coordinator through an email prior to implementing any changes**, to determine if the project still meets the Federal criteria for exemption. If it is determined that exemption is no longer warranted, then an IRB protocol will need to be submitted and approved before proceeding with data collection.
- **Please notify the IRB Coordinator if any problems or complaints of the research occur.**

Please note that you must submit all research involving human participants for review by the IRB. **Only the IRB may make the determination of exemption**, even if you conduct a similar study in the future.