PRESERVICE TEACHERS' DEVELOPMENT OF BRIDGING AND BONDING SOCIAL CAPITAL: INFLUENCES OF THEIR FORMAL AND INFORMAL ONLINE SOCIAL NETWORK SITE USE IN COURSES

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ABSTRACT

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This was a study examining the relationship of pre-service teacher education students' use of social network sites and their development of social capital. The prevalence of social network sites in the research literature offered some tentative evidence of the importance of social capital for pre-service teachers as well as the educational potential of social network sites in education as a tool for developing and sustaining social capital. More specifically, this research focused on the development of bonding and bridging social capital by pre-service teachers. The research used an online survey, which was sent to juniors, seniors and interns in a college of education to gather data about pre-service teachers' self-reported frequency and purpose of use of social network sites. Analysis included an examination of the survey data using quantitative methods, a comparison of current data to that collected by Ellison et al. in a similar 2007 study and qualitative analysis of responses to open-ended questions about experience with the social network site Facebook. The levels of social capital found in the present study were generally consistent with previous studies. Bonding social capital and bridging social capital were positively correlated, as were attitudes toward formal Facebook use and informal Facebook use. The relationships of measures of social capital with Facebook intensity were weak. The students' reports of formal Facebook use by their teacher education instructors and informal use among themselves provided further insight into how the context of social network sites use may influence the development of social capital. The results of this

study contribute to an understanding of how individuals develop social capital, as well as how social network sites are being used by students and their instructors in support of learning.

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This dissertation is also dedicated to the current and future technology pioneers who push the boundaries of what is possible, famously described by Steve Jobs as “The crazy ones, the misfits, the rebels, the troublemakers, the round pegs in the square holes ... the ones who see things differently -- they're not fond of rules, and they have no respect for the status quo. ... You can quote them, disagree with them, glorify or vilify them, but the only thing you can't do is ignore them because they change things. ... They push the human race forward, and while some may see them as the crazy ones, we see genius, because the people who are crazy enough to think that they can change the world, are the ones who do."

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CHAPTER 1: INTRODUCTION

Purpose of the Study

This study examines the exchange of social capital through social media by pre-service teachers. ***Social media*** is a broad term referring to media which "employ mobile and web-based technologies to create highly interactive platforms via which individuals and communities share, co-create, discuss, and modify user-generated content (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011)" (Kietzmann et al., 2011). Over the past decade, the use of a particular type of social media, social network sites (SNSs), has grown rapidly as people embrace tools like Facebook, LinkedIn and Twitter to maintain connections with their social networks. Ellison and Boyd (2014) define ***social network sites*** as "a *networked communication platform* in which participants (1) have *uniquely identifiable profiles* that consist of user-supplied content, content provided by other users, and/or system-level data; (2) can *publicly articulate connections* that can be viewed and traversed by others; and (3) can consume, produce, and/or interact with *streams of user-generated content* provided by their connections on the site" (p. 158). Recently, individuals and academic programs have begun to explore ways in which the affordances of social network sites, most prominently Facebook, can be used for educational purposes (Greenhow, Gibbins, & Menzer, 2015) and enhance the accumulation of social capital of pre-service teachers through their undergraduate studies and in support of their job searches. ***Social capital*** is defined here as the capacity of members of a group to give and receive information through socialization, and accumulate resources (e.g., knowledge and information) as a result of those exchanges (Coleman, 1988; Nicole B. Ellison, Steinfield, & Lampe, 2007; Penuel, Riel, Krause, & Frank, 2009; R. D. Putnam, 2000). Social capital has been used to analyze the advantages that accrue to individuals who over time build a network of personal connections to

advance their intellectual and professional endeavors, but little research has been conducted on the social capital exchanges among pre-service teachers, as will be discussed later in this study, especially in light of the rapid growth of social network sites.

The overall aim of this research was to investigate the development of social capital by students in pre-service teacher education programs and examine how social network sites may be used for this purpose. To that end, this study reviews and analyzes literature on pre-service teacher education students using the lens of social capital and attempts to add to the literature in this area. As will be further elucidated throughout this study, social capital provides descriptive power for framing an examination of pre-service teacher relationships and their effects.

Theoretical Framework

There is a history of encouraging social relationships among teachers, but social interaction among teachers is often constrained by the demands of their work in classrooms and schools. Socially connecting with one another through communication and collaboration are commonly encouraged practices for teachers, and teachers perceive these types of interaction as valuable in improving their own practices (Meirink, Imants, Meijer, & Verloop, 2010). As Granger, Morbey, Lotherington, Owston, and Wideman (2002) put it, "Like effective leadership, the importance of collaboration cannot be overestimated: teachers need each other – for team teaching and planning, technical problem solving assistance and learning" (p.486). Unfortunately, a pervasive characteristic of face-to-face classroom teaching in the U.S. is that it is often an isolated task where teachers are unable to reap the benefits of social connections formed through collaboration with colleagues. This history of not connecting is also prevalent within novice teacher communities.

In a recent study on the experiences of novice teachers, Kardos & Moore Johnson (2007) found that many new teachers report feeling isolated and unsupported in their first years of teaching, and that they do not have many opportunities to form social connections and benefit from collaboration with colleagues even despite, in some cases, working in schools with mandatory induction programs. As Lortie (2002) points out in his well-known book *Schoolteacher*, throughout the history of public education in the U.S. teachers are seldom afforded the opportunity to form social connections with one another. This phenomenon, according to a recent Gates Foundation study (2012), has changed very little over the years. According to the study, almost 90% of teachers think that allowing collaboration is essential to retaining good teachers, but only about three percent of each teaching day is devoted to this activity. This is unfortunate since the most successful schools, are those which allowed teachers the most opportunities to form social connections through collaboration with one another (Newmann & Wehlage, 1995).

Zhao and Frank (2003) examined the specific effects of teacher socialization were in a large-scale study of technology use among teachers. They found that "teachers were strongly influenced by help from colleagues" and concluded that "the distribution of technology implementation is very much a function of the distribution of social relations within the school" (p. 831), reinforcing the notion that social connections can play an important role in the practice of teaching.

Like practicing teachers, pre-service teachers face a variety of challenges in learning the craft of teaching. They must endure heavy workloads and increased pressure and anxiety due to a variety of stressors such as high-stakes testing and new teacher accountability standards (Liou et al., 2013). These stressors are often experienced in the final years of teacher education

programs where students are put in situations that mimic the professional responsibilities of a practicing teacher. In a study of secondary pre-service teachers undergoing their practicum experiences, Chaplain (2008) found that "experiencing high levels of stress, caused by disruptive pupils, high workload, and feeling unsupported during the practicum, may well lead to trainees becoming demotivated, suffering ill health, decide not to teach, or leaving teaching prematurely" (pp. 204-205). Ewing and Manuel (2005) also found that high levels of stress can result in high attrition rates among beginning teachers, reinforcing the idea that pre-service teachers often endure many of the same stressors as practicing teachers.

Pre-service teachers are, however, in a somewhat different situation in that they find themselves (especially in the last two years of most teacher education programs) trying to navigate and balance simultaneously the pressures of both college life and professional life. As will be examined in the review of literature that follows, these demands may be alleviated to some extent through acquisition and development of social capital. Increases in social capital may happen when two or more people who have shared goals interact over time (Etcheverry, Clifton, & Roberts, 2001) and may yield several benefits. However, to date, there is no consolidated picture of how pre-service teachers may acquire or, more importantly, potentially benefit from the exchange of social capital.

Therefore, this study will first discuss and further define social capital before reviewing the research on social capital among undergraduate college students as well as pre-service teachers. It was conceived that first identifying the needs of the larger group, college students, might provide valuable insight into the literature on the needs of the sub-group, pre-service teachers. This is because pre-service teachers, particularly teaching interns, are a distinct sub-group of college students; they are simultaneously being taught while training to teach others

professionally, which means they experience to some extent many of the same stressors as practicing teachers. In addition, pre-service teachers, in their role as undergraduate college students, also share in common many of the stresses and pressures experienced by college students in non-education programs. Finally, specific mechanisms of social capital not identified in the undergraduate and pre-service teacher education student research literature will be examined through a review of some social capital literature in an effort to fill gaps in the literature and increase the usefulness of this study for both pre-service teachers and educators. This study will conclude with a discussion of the implications of the work on social capital and its impact on both pre-service teachers and educators at all levels.

Why Social Capital?

The broad benefits of social capital have been studied and written about for many years. In a paper discussing the potential impact of technology on social capital, (Resnick, 2001) describes the broad benefits of social capital by asserting that "a network of people who have developed communication patterns and trust can accomplish much more than a bunch of strangers, even if the two sets of people have similar human, physical, and financial capital available"(p. 1). Some specific benefits of social capital which have been studied and written about include better public health (R. D. Putnam, 2000), better financial markets (Adler & Kwon, 2002), and better educational outcomes (Putnam, 2000).

Robert Putnam, a political scientist and one of the most well-known advocates of social capital research (Patulny & Svendsen, 2007), proposed the idea that "a society that relies on generalized reciprocity is more efficient than a distrustful society, for the same reason that money is more efficient than barter. Trust lubricates social life" (R. D. Putnam, 1993, p. 3). In his popular book on the societal benefits of social capital, *Bowling Alone: The Collapse and*

Revival of American Community, Putnam (2000) argued that social capital is "highly correlated with student scores on standardized tests… as well as with the rate at which students stay in school" (p. 299) and that social capital can also have a positive influence on health. The claimed benefits of social capital, according to Putnam, reflect neither the cause nor the effect of social capital, but rather correlation with particular phenomena. He suggested that by looking carefully at the *nature* of the social phenomena correlated with social capital, we might be able to determine if a cause and effect relationship is present. However, attempts to determine these relationships have raised questions among researchers over the years (Foley & Edwards, 1997). Some have characterized social capital as being more of a cyclical process (Newton, 1997), in which the benefits of social networks feed back into themselves, thereby creating additional benefits. The current research investigated the benefits of social capital for pre-service teachers, but did not seek to prove a causal relationship.

Social Capital Types

Since social capital is a broad concept, in an attempt to gain additional clarity, the current study investigated not only work on social capital in pre-service teacher education, but also two of the most important dimensions along which social capital may vary - ***bridging*** and ***bonding*** (R. D. Putnam, 2000). In a paper aimed at clarifying the bridging/bonding dichotomy, Patulny and Svendsen (2007) proposed, "The bridging/bonding conceptual pair offers a theoretical framework that acknowledges social capital as capable of both collective good and evil, involving both positive and negative externalities" (p. 36). They acknowledged the positive potential of this binary classification, but warned researchers against using it to oversimplify and reduce complex phenomena into separate, opposing forces. Putnam (2000) acknowledged the complex nature of this dichotomy with the following: "Bonding social capital constitutes a kind

of sociological superglue, whereas bridging social capital provides a sociological WD-40… [these] are not "either-or" categories into which social networks can be neatly divided, but "more or less" dimensions along which we can compare different forms of social capital" (p. 23). Depending on the situation or context in which one is located, each type of social capital, bridging and bonding, may provide different ranges of benefits. For example, bridging networks "are better for linkage to external assets and for information diffusion," whereas bonding networks are "good for undergirding specific reciprocity and mobilizing solidarity," and can provide "crucial social and psychological support" for members (R. D. Putnam, 2000, p. 22).

Further illustrating the notion that bridging and bonding social capital co-exist along a spectrum, Patulny and Svendsen (2007) conducted a review of social capital literature and concluded that researchers should seek a "harmonious mix of bridging/bonding social capital" (p. 44). Further, they suggested that because bridging capital tends to focus on larger and more diffuse social networks it is often aligned with quantitative research methods whereas bonding capital, with its focus on smaller, more intimate group connections, tends to be aligned with qualitative research methods. An advantage of using the bridging/bonding lens, they argued, is that it "captures the diffuse nature of social networks" (p. 36) in a way that frameworks such as Social Network Analysis, which tends to focus on quantifying social structures such as gender and income, cannot.

Reviewing the literature through the lenses of bridging and bonding social capital may simultaneously capture the dynamics and potential, both good and bad, inherent in both the inclusive (bridging) and exclusive (bonding) nature of group interactions and identify the corollary needs these types of social capital may be fulfilling for pre-service teachers. A better understanding of the literature from this perspective may also help identify practical

recommendations for the acquisition and use of these particular types of social capital by pre-service teachers as well as educators.

Bridging Capital

Bridging capital tends to be "outward looking and encompass people across diverse social cleavages" (R. D. Putnam, 2000, p. 22). The ties between people in bridging networks are considered inclusive and can be found in groups such as those who participated in the civil rights movement, youth service groups or ecumenical religious organizations (R. D. Putnam, 2000). It is the culmination of these "loose connections between individuals who may provide useful information or new perspectives for one another" (Granovetter, 1983) that makes the weak ties developed in bridging capital useful. Bridging capital ties are considered weak because they often rely on the external connection of groups in which members may or may not know each other well. However, an important consideration to keep in mind is that although the ties in bridging social capital are termed "weak," they are not necessarily less beneficial than their counterpart, bonding capital, which consists of close, strong ties.

According to Weimann (1983), in a study analyzing the flow of information within a community,

> "The importance of weak ties lies in the transmission of information between subgroups, enabling the diffusion of news, ideas, fashions, innovations, gossip and rumors to every segment of the social system. Without the bridging function of weak ties, any momentum generated in the small face-to-face group will not spread beyond the group, so that individuals will be deprived of information from distant parts of the social system and will be confined to the parochial news and views of their close friends" (p. 264).

In relation to pre-service teachers, since bridging capital connects people from different circles (e.g., social, geographic, etc.), these weak ties could potentially alleviate the stress that comes with tasks such as job searching – a pressure not experienced by practicing teachers. Job searching is an undertaking where success is more often, and somewhat counter intuitively, found within the casual connections to networks beyond one's own tightly bonded circles. This is because the potential number of recipients of job information tends to be greater when weak ties are involved (Granovetter, 1995, p. 53). And in the modern era of online social networking, the potential to develop the weak ties characteristic of bridging capital may be even greater since the Internet and social network sites such as Facebook allow users to develop larger and more diffuse networks of casual connections than ever before (Nicole B. Ellison et al., 2007).

Bonding Capital

Bonding capital exists where group membership tends to be exclusive and is often developed through strong, cohesive relationships among members of groups that are typically homogenous (Woolcock, 1998) Ethnic fraternal organizations, church-based women's reading groups, and fashionable country clubs are examples of groups maintaining high levels of bonding capital (R. D. Putnam, 2000).

In contrast with bridging capital, bonding capital has received much less attention in the literature (Patulny & Svendsen, 2007). In a review of social capital research intended to further our understanding of social capital research methodologies and how they align with either bridging or bonding social capital, Patulny and Svendsen concluded that the smaller group relationships involved in bonding capital tend to align with qualitative methods of research, while bridging capital tends to align with quantitative research methods. They posited this is a result of the majority of social capital research being conducted within the domains of political

science and economics, where studies tend to be large in scale. And, by nature, large-scale studies seem to align more closely with quantitative methods, such as social network analysis. Therefore, they claim, since most social capital studies are quantitative in nature and align with bridging capital, bonding capital receives less consideration and investigation (Patulny & Svendsen, 2007).

The lack of attention to bonding capital seems to be present in other social capital research areas as well. For example, it makes sense that the Internet would play some type of role in the building of bonding capital. However, unlike bridging capital, where capital is developed through weak ties, which are common across the Internet, the relationship between Internet use and bonding capital is not quite as clear. Though researchers have speculated that the Internet may impact the development of the close ties and homogenous groups characteristic of bonding capital, it is unclear whether it enhances or displaces these ties (Nicole B. Ellison et al., 2007).

CHAPTER 2: LITERATURE REVIEW

Pre-service teachers' development of social capital

The literature on this topic is not extensive, thus locating and selecting appropriate literature for inclusion in this study was challenging. This review used a selective coding process to initially define criteria for determining relevant literature. Strauss and Corbin (1990) described selective coding as "the process of selecting the core category, systematically relating it to other categories, validating those relationships, and filling in categories that need further refinement and development" (p. 116). The initial broad categories, which defined the initial selection criteria, were based on an initial review of the available literature in relation to the one of the major aims of this investigation: To better understand the role and development of social capital through the use of SNSs among pre-service teacher education students. For the purpose of maintaining focus on the use and potential benefits of social capital *during* students' pre-service teacher education experiences, this review intentionally limited the research to analyses of students actively engaged in college coursework, in contrast to those in which social capital was investigated in relation to college students' experiences before, outside of, and beyond the college experience.

Social capital, broadly interpreted, could potentially include all literature in which two or more persons interact, which would make an investigation of relevant literature practically impossible. For example, the literature on professional learning communities was intentionally excluded from the current review. Although professional learning communities seem to have a logical connection to social capital (i.e., they are each concerned with social interaction, in this case among teachers), professional learning communities are generally limited to examination of collaboration among teachers rather than the network ties teachers acquire and possibly maintain

amongst themselves and with the greater community. This type of research was not included in the present review in order to maintain focus on the role and potential benefits of social capital as a distinct framework, in which bridging and bonding are unique constructs. Therefore, another goal, and potential contribution, of this study is that it is attempts to construct a theoretical framework through which to examine pre-service teacher education literature in a way that has been, for the most part, previously unexplored.

Taking these parameters into account, articles were selected by searching within online databases such as Google Scholar and ProQuest using various combinations of both predetermined and emergent keywords (e.g., pre-service, teachers, social capital, college students, Facebook). The category "Facebook" was one of several sub-categories to emerge and be incorporated into the search process since a large portion of the literature seems to center on college students' exchange of social capital through the use of Facebook. Also included in the search were citations within articles to better ensure discovery of the most relevant resources possible.

It is speculated that Facebook's ubiquity among college students in 2015 and its natural association with fostering social ties (Donath & Boyd, 2004) may have contributed to the volume of research that has been done in relation to social capital among college students.

Searches resulted in articles from peer-reviewed journals, working papers and conference proceedings. With regard to college students and social capital, approximately 50% of the literature reviewed involved the use of Facebook. 40% of the articles reviewed focused on pre-service teachers and social capital, and 50% involve the use of Facebook.

Social network sites

Though the majority of literature on social capital among pre-service teachers and college students centered on the use of online social network sites, in this case Facebook, none of the studies analyzed pre-service teachers' networking within social network sites through the lens of social capital (see Figure 1). The graph below visually represents a breakdown of the literature, highlighting this gap in the research. With regard to the central focus of the current study, pre-service teachers' development of social capital through use of social network sites within teacher education programs, the literature seems to some degree under theorized and disjointed; there does not appear to be a single line of inquiry in which a majority of studies on pre-service teachers and social capital falls, but rather small portions of research loosely held together by similar ideas rather than theoretical frameworks or research methods.

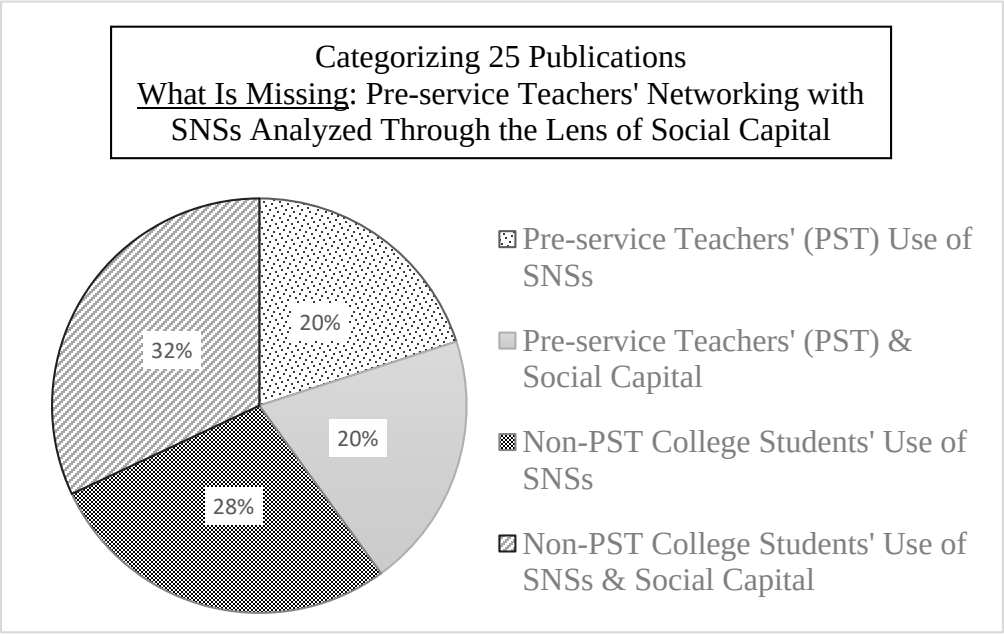


Figure 1. Literature review topic categorization by percent.

Benefits and Drawbacks

In need of further examination are the benefits and drawbacks of social capital for pre-service teachers. Most researchers have adopted the perspective that what is good for the larger

group must also be good for the sub-group. Specifically, researchers described the broad benefits of acquiring social capital in support of their arguments on why particular sub-groups, such as college students or pre-service teachers, might want to attain social capital. For example, in a study by Johnston, Tanner, Lalla and Kawalski (2013), the researchers supported their argument for the importance of the investigation with evidence claiming that "social capital has been shown to be a forecaster of school attrition, academic performance, physical and mental health, children's intellectual development, sources of employment, juvenile delinquency and its prevention, and economic development" (Coleman, 1988; Johnston et al., 2013; McKenzie, Whitley, & Weich, 2002; Portes, 1998; R. D. Putnam, 2000) as cited in (Johnston et al., 2013, p. 26). This study replicated Ellison, Steinfield and Lampe's 2007 study investigating the role Facebook plays in the development and use of social capital among college students. In comparing their findings to those of Ellison et al. (2007), the investigators found a slightly weaker relationship between Facebook use and bridging social capital and no relationship between Facebook use and bonding social capital among university students in South Africa. These findings suggest that Facebook contributes little to the benefits assumed with bridging social capital and nothing to the benefits assumed with bonding social capital. Discussion of the potential drawbacks or benefits imbued by Facebook outside of its relationship with social capital was absent.

The majority of the literature reviewed here examined the correlation between levels of social capital and particular activities of students, not the ways in which it may positively or negatively affect college students or pre-service teachers. In other words, much of the research seems to take the benefits of social capital and generalize them to sub-groups, in this case college students and pre-service teachers. This generalization assumes that what may be a trend for the

whole, society, must also trend within sub-groups, college students. While there may be some truth to this logic, might we be missing specific additional benefits and drawbacks of social capital among these sub-groups? In an attempt to examine this idea further, the following section will discuss and analyze the few studies which have attempted to ascertain through research the benefits and drawbacks of acquiring social capital among undergraduate college students as well as pre-service teachers.

Focus on Bonding Capital

In contrast with the literature that suggests bridging capital tends to receive more research attention than bonding capital (Patulny & Svendsen, 2007), within the domain of teacher education and social capital the opposite may be true since this research often focuses on the interactions of those within a particular sub-group. The research on social capital among pre-service teachers under examination here suggests a focus on the bonding relationships among members of small groups, typically cohorts, and not the development of bridging capital through weak ties to those outside a cohort or program. Of the studies reviewed here, only one study (Maier & Youngs, 2009) focused on bridging capital.

Maier & Youngs (2009) examined the impact of social capital accrual among pre-service teacher education students on job searching. The authors suggest that the accrual of social capital is majorly influenced by social structure and that colleges of education should use this notion to correct inequalities in the placement and subsequent hiring of high quality teacher candidates. They argue, “The expectations of cooperating teachers, university instructors, and peers can strongly shape teaching candidates’ approach to the job search process and limit them from considering positions in high-needs schools" (p. 404). Their framework proposes that colleges of education, which already facilitate the development of *bridging* networks between

pre-service teachers and K-12 schools, leverage this influence to enhance student connections to high needs schools, which historically have a difficult time finding high quality candidates. According to the data, Maier and Youngs claim, students at Michigan State University are much less likely to teach in high needs schools - although they do acknowledge that it is unclear whether the lack of participation high needs schools not to participate with the college of education was the university's decision or that of the cooperating school.

This gap in the literature may indicate a need for more research investigating how pre-service teachers develop bridging capital through communication and collaboration beyond their own tight knit cohorts. Such an understanding may have value in, among other things, assisting teacher educators in teaching pre-service teachers how and why they might benefit from networking and collaboration beyond their cohort groups. This, according to a study on pre-service teacher cohorts by Mandzuk, Hasinoff and Seifert (2003) may have other potential benefits as well.

Mandzuk, Hasinoff and Seifert (2003) sought to better understand the effect of cohort grouping among pre-service undergraduates in a college of education from a social capital perspective. The researchers administered a survey, *Measuring Social Capital in Cohort Groups*, to 239 student teachers and instructors. Of particular significance in this study is the final open-ended question in the student survey, which reads, "If you have any other thoughts about your experiences as a student teacher both inside and outside the cohort, please share them below" (Mandzuk et al., 2003, p. 173). From the responses to this final question, the researchers concluded that the close-knit nature of cohort groups seems to promote bonding, not bridging social capital.

In analyzing the data as a whole, the researchers also concluded that while bonding capital seems to have positive effects for pre-service teachers, such as social and emotional support and sense of community, there can be negative consequences. In particular, the researchers believe that by promoting the development of bonding, and not bridging, networks in undergraduate pre-service teacher education, educators may unintentionally contribute to the following: Crowding out alternative perspectives in courses, supporting weak teachers who may have problems in later practice when this strong support is removed, and stunting pre-service teachers' ability to develop social networks later in their professional careers. In other words, too much bonding could potentially curtail opportunities for outreach by pre-service teachers in their future careers. The development of bridging networks, they argue, is an essential part of a teacher's career as they alleviate some of the isolation and "ideological insularity which currently plagues our field" (Zeichner & Liston, 1990, p. 25) as cited in (Mandzuk et al., 2003, p. 180) in addition to other negative consequences identified above. Mandzuk, Hasinoff and Seifert suggest that colleges of education solve this problem by promoting the development of bridging capital by allowing pre-service teachers more flexibility in scheduling so that they might take courses outside of their tightly bonded cohort groups.

Though the Mandzuk, Hasinoff and Seifert (2003) study, like most, is mainly focused on the medium through which pre-service teachers attain social capital, cohort groups, it goes one step further in positing that the acquisition of social capital can have both positive and negative effects and does so as a part of the investigation, not through citation of outside research; this is a departure from most of the literature identified and analyzed in the current study.

What is particularly interesting about the Mandzuk, Hasinoff and Seifert (2003) study, in relation to others in this area, is that the authors suggest colleges of education offer students a

greater variety of coursework outside of their cohorts in an effort to increase bridging capital and increase the diversity of perspectives and ideas within cohort groups. Since this study was conducted in 2003, the authors did not include suggestions for accomplishing this goal using social network sites, a technology which affords people the opportunity to easily connect with one another and share, among other things, a diversity of perspectives.

However, Lewis and West (2009) counter this notion that social networking spaces may be particularly good at facilitating profitable relationships among college students. Lewis and West explored the extent to which college students were using social network sites (in this case, Facebook) and whether the ties created in this social network were of any value to college students. Based on interviews with 16 third and fourth year undergraduates in the U.K., the researchers concluded that Facebook offered to undergraduate students only "broad, low pressure and low commitment communication with acquaintances" (p. 1223). Their findings suggest that while students were individually building *bridging* groups (those with weak ties), there was no evidence of connection among these bridging groups within the Facebook environment. In other words, where student A is tied to both acquaintance group B and acquaintance Group C, groups B and C are not tied to one another. In fact, students expressed some concern over blending their different groups of friends.

On balance, the authors acknowledge that these attitudes were influenced by the technical and structural nature of Facebook, which had only been released a few years before this study was conducted. With the advent of "Facebook Groups," after this study was conducted, for example, students do not have to worry about blending their groups of friends or acquaintances together. The system allows membership and separation between groups. But with the advanced "friend" suggestion algorithm, the system encourages blending. For example, Facebook may

recognize acquaintances of Student A from isolated group B and isolated group C and recommend they connect with one another, thereby developing bridging capital among individuals from two formerly isolated groups. While this is not the same as bridging together bonded groups of friends who may have bonded over a particular course or interest, it nonetheless speaks to the impact technological innovation has had on the development of both bridging and bonding social networks and research in this area.

Though the Lewis and West (2009) study departs from the focus of the current section on pre-service teachers' use of social network sites in building either bridging or bonding social capital, it speaks to the development of bridging groups with social network sites and counters to some extent the idea that online social network sites naturally develop bridging capital across groups of college students. In other words, the use of social network sites such as Facebook among pre-service teachers may not necessarily inhere within their use an increase in bridging capital and connections outside a teaching cohort. This finding may be particularly important for teacher educators considering whether and/or how to integrate social network sites into courses. The following section will investigate these ideas further through discussion of the impact of social network sites on social capital research.

Research Pre and Post Facebook

After 2007, the majority of studies examine social capital among college students or pre-service teachers in relation to Facebook use. This section will review several studies conducted before, during, and well after the establishment of social network sites as a ubiquitous technology among college students in an effort to examine the effects online social networking have had on both students and research in this area.

Etcheverry, Clifton and Roberts (2001) investigated whether social capital has an effect on the educational attainment of college students. From a social capital survey of 269 students in a college of education, they concluded that certain aspects of social capital affect how well undergraduates perform in school. Specifically, they found that student perception of support from other students (i.e., the acquisition of social capital) was positively correlated with achievement. The authors argue the social capital framework provides "a theoretically informed way for universities, faculties, and professional schools to attend intentionally to social structural factors that have important effects on students" (pp. 35-37). They suggest that higher education institutions pay close attention to the social structural factors that influence the acquisition of social capital among students in "achieving one of the university's most important goals, that of educating students" (p. 37).

Hasinoff and Mandzuk (2005) used a questionnaire they piloted in an earlier 2003 study measuring the impact of cohort groups on social capital, but this time they were interested in whether social capital has an impact on teacher identity, not their perception of their cohort experiences. The researchers found that bridging capital was not prominent in the program and had little impact on teacher identity. "The resources that students generated and accessed outside their cohort did not appear to have a significant effect on how students anticipated their roles as teachers or the degree to which they valued teaching as a priority in their lives" (pp. 242-243), whereas the development of bonding capital related positively to pre-service teachers' development of identity. "Students who developed common understandings, trust, reciprocity, and a sense of community in their cohort anticipated becoming teachers and became committed to their teacher role" (p. 242). In conclusion, the researchers suggest that the accrual of social capital does indeed have an impact on pre-service teacher identity and that the theory, scales and

models they used may be useful to future studies investigating the impact of social capital on pre-service teachers.

The above studies were conducted prior to the advent of the pervasive use of social network sites among college students (Duggan, Ellison, Lampe, Lenhart, & Madden, 2014). With the advent of social network sites, research on social capital among college students went from studying face-to-face interaction to studying online interaction. The following study illustrates the transition of research before and after social network site use spread among college campuses.

In a study that seems to bridge the gap between social capital research that focuses on face-to-face interaction and that which focuses on online interaction, Ellison et al. (2007) conducted a study on 286 undergraduate students in an effort to examine he relationship between the students' use of Facebook and the formation of bridging, bonding and maintained social capital and determine if online social networking sites such as Facebook can generate offline social capital. They concluded, “We can definitively state that there is a positive relationship between certain kinds of Facebook use and the maintenance and creation of social capital. Although we cannot say which precedes the other, Facebook appears to play an important role in the process by which students form and maintain social capital" (p. 1161).

Further, their findings show “a robust connection between Facebook usage and indicators of social capital, especially of the bridging type” (p. 1164). This is not surprising since Facebook makes connecting to others, especially those outside of one’s close-knit circles, an extremely simple task. "Because bridging social capital provides benefits such as increased information and opportunities, we suspect that participants who use Facebook in this way are able to get more out of their college experience…such connections could have strong payoffs in

terms of jobs, internships, and other opportunities. Colleges may want to explore ways to encourage this sort of usage" (pp. 1163-1164). This is very relevant to pre-service teachers as they often seek assistance with jobs and internships, usually in quick succession.

This study marks a pivotal point in social capital research for several reasons. First, the authors found that Facebook is especially valuable for promoting bridging capital among college students, a problem Hasinoff and Mandzuk (2003) thought might only be remedied through increasing course variety. Second, the authors developed and validated an instrument for measuring social capital both on and offline; an instrument which has been used several times since in similar studies. Finally, this study was conducted soon after the advent of one of the most popular brands of social network site in the world, Facebook, and explores the worlds of face-to-face and electronic interaction through social network sites. After 2007, 18 out of 20 studies, including this one, examine social capital among college students or pre-service teachers focusing on Facebook as a medium through which social capital might be attained.

For example, Bosch (2009) conducted a virtual ethnography and qualitative content analysis of 200 University of Cape Town (UCT) student Facebook profiles. The researcher also conducted semi-structured qualitative interviews with a purposive sample of 50 undergraduates and five lecturers currently engaging with students via Facebook. The results of this study suggest that a potential positive benefit to using Facebook in a higher education setting appears to be the development of educational micro-communities. "Facebook is widely used on the UCT campus for connecting members of student societies, and to a range of student groups, residence halls and sporting societies. Many of these groups appear to serve the purpose of community building, keeping members of specific academic programmes in touch with one another via the website, or for information sharing among people who meet in 'real world' environments"

(Bosch, 2009, p. 193). The results of this study suggest that online social network sites are being used by students to develop bridging networks in the form of micro-communities and that students are reaping certain benefits by accruing social capital in this way. This study contrasts with the findings in the 2009 Lewis and West study in which college students gain social capital from belonging to groups with weak ties, even if these groups do not crossover or influence one another.

The studies reviewed here provide some evidence of the potential of social network sites to enhance students' development of social capital. However, there are several gaps in the extant literature, which should be addressed.

First, there is no research on pre-service teachers' networking with social network sites analyzed through the lens of social capital. For example, in a study on post-B.A. teaching interns at a public four-year university, Boriack, Alford, Braziel Rollins, & Waxman (2012) examined how a Facebook Group could facilitate communication among the interns, who did not meet often in person. In their analysis of the interns' interactions, the researchers evaluated the Facebook Group posts for emergent themes and interviewed the teaching assistant, who monitored the Group, for further insight. The researchers reported their findings as being comparable to the findings of a similar study by English and Duncan-Howell (2008) in which researchers suggested that Facebook Groups can foster a sense of community among pre-service teaching interns. The researchers noted, "the Facebook Group appeared to offer a positive approach for students to communicate in an informal environment" (Boriack et al., 2012, p. 40). In addition, the teaching assistant who participated in the study thought that Facebook Groups could be a useful tool for facilitating communication among interns as well as first year teachers.

Though small in scale, these studies lend some insight into Facebook's potential as a useful tool for facilitating asynchronous communication and collaboration among teaching interns. However, the results of these studies are somewhat difficult to compare, as they do not share a common framework. The exchange and benefits of social capital are implied, but not directly measured in a way that might allow better comparison among groups. Given the rapidly growing realm of social network sites and the established value of social capital to students, research embracing the theoretical framework of social capital is needed.

Second, though some research does exist on the benefits of social capital for pre-service teachers, few studies frame this issue within the bridging and bonding construct. Further, the research that does use this framework tends to focus on the bonding aspect of social capital. Research on bridging social capital may be especially useful in light of widespread adoption of social network sites among pre-service teachers and the potential usefulness of bridging capital for things like job seeking and staying informed on the latest developments and trends in education.

Third, though research on bonding social capital among pre-service teachers is more prevalent than bridging research, there is still more work to be done in this area as well. Since teachers tend to work in isolation, research into how teachers might find alternative ways to connect with one another and collaborate or how pre-service teachers connect with larger networks for activities such as job seeking could be useful. Examining use of Facebook in a teacher education context may also lend insight into the circumstances under which integrating social network sites into teacher education programs may impact social capital exchanges among pre-service teachers. To this end, the current study will attempt to fill gaps in the literature using the social capital framework developed by Ellison et al. (2007) to examine the relationship

between Facebook use and social capital and then extend this framework to examine particular uses of Facebook by pre-service teachers. This will be accomplished through employment of a Facebook use typology developed from responses to existing survey data.

A Facebook Use Typology

The Facebook typology proposed for use in the current study was developed using data from a survey deployed to juniors and seniors enrolled in a 400-level education technology course. The survey asked participants how they have used or have participated in courses that used Facebook within the context of a teacher education program. In coding the open-ended responses, a dichotomy emerged: formal and informal uses of Facebook. This dichotomy will frame the in depth examination of Facebook use that follows.

Formal uses of Facebook are those in which pre-service teachers initiated use whereas informal uses are those in which an instructor initiated use. Out of 220 respondents, 75% reported using Facebook within the context of the teacher education program. 51% reported informal use of Facebook for activities such as forming online study groups and sharing school related information. 43% reported using Facebook formally within a course for activities such as completing group projects and participating in instructor led discussion forums. 17% of respondents reported using Facebook for both formal and informal activities. This data suggests that social network sites are being widely used among juniors and seniors within a teacher education program for both formal and informal purposes. It is hoped that this typology might assist in the examination of Facebook uses by focusing on the different ways in which Facebook is being used within a teacher education program. This, in turn, might assist teacher educators and students in deciding which uses of Facebook may be most profitable.

Informal Facebook use. Informal uses of Facebook reflect intrinsic motivation by students to connect and communicate with one another in rich social capital exchanges. In a recent exploration of the types of learning that take place on Facebook among students in informal settings, Greenhow et al. (2015) concluded, "Informal, non-school, social media environments… can provide opportunities for young people to engage in debate about socio-scientific issues, which in turn, serve as powerful facilitators for developing learners' contemporary scientific literacy (p. 9)." In terms of social capital, this research suggests that informal online social network affinity spaces (places where individuals who share common interests can meet, exchange ideas or participate in common activities) have the potential to facilitate rich social capital exchanges. There are several other studies pre-dating the Greenhow et al. study, which also examine student behavior in informal Facebook spaces.

In a study by Schroeder (2009), 128 undergraduates enrolled in an introductory chemistry course were invited to either join a Facebook group or use the course learning management system, WebCT, to communicate with classmates on course related matters. Findings of the study indicated that students used the Facebook group more frequently than the WebCT discussion forum. Even though only 41% of students joined the group, they posted 400% more on the Facebook group than WebCT. The authors speculate the difference in use may indicate that students are already accessing Facebook daily and therefore are more inclined to post and respond to the posts of others. This might suggest a sort of proximity effect within an informal environment where the benefit of utilizing the system may outweigh the cost due to the low barrier to participation.

In another 2009 study, (Valenzuela, Park, & Kee) examined life satisfaction, social trust, civic and political participation, intensity of Facebook use, intensity of Facebook Group use, and

socio-demographics of over 2,600 undergraduate Facebook users. Findings suggested a positive relationship between Facebook intensity and social trust, life satisfaction, civic engagement, and political participation – all factors thought to contribute to higher levels of social capital. What is not clear, however, is the specific type of Facebook use contributing to higher levels of social capital.

In an effort to understand what types of Facebook uses students find useful, Gray, Annabell and Kennedy (2010) investigated how four groups of medical students used Facebook Groups to support their learning at a large metropolitan university. The researchers surveyed 759 students, and of these selected six who indicated belonging to Facebook study groups for interviews. Interviewees reported the following uses of Facebook: facilitating exam review by posting and answering questions, sharing comments on graded essays, facilitating in-class learning and sharing class-related resources, and updating one another while studying in various places. The researchers noted that the students interviewed "made no connection with more professionally oriented social networking sites that might be worthwhile for their future professional learning, nor with other aspects of how social web technologies might support professional practice" (p. 975). Further, some participants reported the absence of established norms for use of the Facebook group such as the lack of ground rules for what type of information is appropriate to post within the group negatively affected their participation in the group.

The researchers concluded, "These findings may suggest that medical educators could have a role in advising students on how to conduct online study groups so as to get better value from them, or even in monitoring or guiding their activities. However, educators should exercise caution about intervening directly in Facebook. Students in this study consistently regarded

Facebook as a social study space beyond the reach of university staff. It appears problematic for staff to try to formalize Facebook use in education" (p. 976).

Lampe, Wohn, Vitak, Ellison, & Wash (2011) examined "how undergraduate students use Facebook to engage in classroom-related collaborative activities (e.g., arranging study groups, learning about course processes) to show how Facebook may be used as an informal tool that students use to organize their classroom experiences, and explore the factors that predict type of use" (p. 1). They conducted two surveys of college students at a large Midwestern university on their use of Facebook for "classroom-related collaborative activities" (p. 329). Survey results indicate that students used Facebook for four classroom-related collaborative activities: arranging meetings for Group projects, asking classmates for help in the course, managing group project tasks, and collaborating on course-related exercises.

Sgambato (2011) distributed a questionnaire similar to that used in the Ellison et al. 2007 study. The researchers hypothesized that students actively using Facebook to connect with colleagues would engage in more activities on campus. "In a way similar to Ellison et al. (2007), our findings indicate that Facebook usage is a significant factor in campus life at ECSU. It contributes to building both bridging and bonding social capital by students. This increase in social capital has implications on many departments within the university. Thus, the university's division of student affairs can integrate the use of Facebook to create lasting relationship among students. This can lead to a higher participation in events this department holds and others such as academic affairs, student clubs and others." (p. 512)

Steinbrecher & Hart (2012) examined and the Facebook pages of 54 pre-service teachers. Data indicate limited use of Facebook pages for educational purposes. The educational uses of

Facebook in this study, albeit limited, included reaching out to classmates for instructional ideas and support.

These findings suggest several dynamics worth keeping in mind when considering ways in which social networking sites might be productively integrated into the undergraduate college experience: 1. The closer the proximity to a social networking site, the lower the barrier to participation, which may lead to increased participation. 2. Higher Facebook frequency leads to higher social capital. 3. Informal Facebook use by students should be encouraged, but staff should not intervene in that use. 4. Students tend to use Facebook informally as a platform for giving and receiving assistance.

Formal Facebook use. Velasquez, Graham, & McCollum (2009) examined integration of social networking tools within an instructional technology course for pre-service teachers with mixed results. Some pre-service teachers in this study thought that Facebook was convenient since they were already using the system while others thought it intermixed their personal and academic lives too much.

Ractham, Kaewkitipong, and Firpo (2012) explored the use of Facebook among 75 first-year students in three Management Information Systems courses at Thammasat University, Thailand. They investigated whether Facebook could foster an engaging constructivist learning environment and help form a community of practice that would enable students to achieve learning through social interaction. The results indicate that students overall liked using the Facebook environment for communicating with their classmates and instructors. Although many students thought the system was a good tool for communicating, they did not equate improved communication with increased learning. The researchers concluded that "there is great potential for informal learning environments where users utilize Facebook as a centralized space to

communicate, collaborate, and achieve complementary learning to the in-class material" (p. 180).

O'Bannon, Beard, & Britt (2013) examined how 82 pre-service teachers in a required educational technology course at the University of Tennessee used a Facebook Group to acquire knowledge of technology topics. They examined student attitudes toward using Facebook in an educational setting as well. The results indicate there was little communication among students. Rather, their participation was limited to accomplishing the learning goals set forth by the course instructors. What is interesting here is not the communication and collaboration present among students in this setting, but the lack thereof. In this context, where use of Facebook was prescriptive and a required part of the course, student participation was low. The researchers concluded that in order for a Facebook Group to be successfully integrated into the course, "students must consider the activity valuable" (p. 3328) and added that low participation was observed in the posting of comments. These findings suggest that even though students, in socially connecting with others, might see a particular technology as generally useful, they may not consider it useful when use is prescriptive and enforced.

These studies, which examine formal use of Facebook, seem to suggest that productive use may be characteristically similar to that suggested by studies of informal spaces: social network sites such as Facebook seem to be used most productively when students take the lead in defining and integrating this third space into the course experience. However, both formal and informal studies suggest that instructor guidance in the establishment of norms for ensuring a productive online experience may be valuable.

Summary of Existing Research on Formal and Informal Uses

These studies examining the formal and informal uses of Facebook in the higher education context seem to give some clues as to what productive and unproductive use of Facebook might look like for college students. In the following section, research questions aim at gaining an even better understanding of productive and unproductive uses of Facebook within teacher education. Though the findings discussed here may be generalizable to some extent from college students to pre-service teacher education students, a sub-group of college students, it would be valuable to understand on a more granular level what differences exist, if any, and further what productive social network site integration in a teacher education programs might look like. This would be valuable for teacher education institutions, instructors and students.

Research Questions

In research examining the connection strategies of Facebook users, Ellison, Steinfield, and Lampe (2011) point out that while some studies provide support for a connection between social capital and Facebook use, we still do not know which uses of Facebook contribute to positive social capital outcomes. Given the ubiquity of use of social network sites in higher education, this study will provide a connection between Ellison et al.'s work and the context in which teacher education students are forming their sense of how Facebook might be used for educational purposes. Questions of quantitative and qualitative open-ended formats are presented to try to capture a sense of the context of Facebook use among instructors and pre-service teacher education students at a large Midwestern university in 2014-15.

The current study aims to add to the literature by replicating previous work on the connection between Facebook use and social capital, and then exploring what particular activities may contribute positively to social capital exchanges. Anecdotal and statistical

evidence suggest pre-service teacher education students are using Facebook. However, we do not yet have a full understanding of if, or how, these social capital exchanges are useful to students or teacher educators. Therefore, the following research questions will examine social capital exchanges among pre-service teachers using an existing, tested social capital framework and extend this work within the framework of formal and informal uses of Facebook.

The proposed study will address the following questions:

RQ 1: How does Facebook use and social capital of pre-service teachers (a sub-group of college students) in the current study compare to the greater population (college students) examined in a similar 2007 study?

RQ 2.1: What is the relationship between pre-service teachers' Facebook use and their self-reported level of bonding social capital?

RQ 2.2: What is the relationship between pre-service teachers' Facebook use and their self-reported level of bridging social capital?

RQ3: What is the relationship between Facebook use and year in the pre-service teacher education program?

RQ 4.1: What is the relationship between students' reports of instructor-initiated (formal) uses of Facebook within the teacher education program and their self-reported bridging and bonding social capital?

RQ 4.2: What is the relationship between students' reports of student-initiated (informal) uses of Facebook within the teacher education program and their self-reported bridging and bonding social capital?

RQ 5: How do pre-service teachers describe their experiences with Facebook use in the teacher education program?

CHAPTER 3: METHODS

The purpose of the proposed study is to investigate the relationship between Facebook use and social capital among pre-service teachers with the aim of gaining a better understanding of the potential benefits and drawbacks of integrating social network sites into teacher education. It is acknowledged that Facebook is only one of many SNSs. But, as Ellison, Steinfield and Lampe (2007) put it, "Facebook constitutes a rich site for researchers interested in the affordances of social networks" (p. 1144). In addition, because of its large participant base, 1.01 billion daily active users on average for September 2015 (http://newsroom.fb.com/company-info/), and "technical ability to foster relationships" (Tong & Walther, 2011), in this case the exchange of social capital among pre-service teachers, it was thought that Facebook would be a fertile ground for studying the impact of social network sites on pre-service teachers. The following describes the methods and instruments used in this study.

Research Design

A mixed-method design was used to conduct this study due to its unique ability to afford both generalization and precision in describing the in-depth experience of individual perspectives (Creswell, 2013). A population of pre-service teachers from the College of Education at a large Midwestern university in the United States participated in a survey measuring their use of Facebook, their perceptions of bridging and bonding social capital and how they use Facebook in the teacher education program. The survey captured both quantitative and qualitative data in the form of multiple choice and open-ended questions.

Participants

The target population for this study was a group of 1,102 pre-service teachers at the junior, senior and intern levels from a large Midwestern university in the United States. The

sample consisted of 391 pre-service teachers at the junior, senior and intern levels who responded to an electronic survey emailed to the target population. Using a cross-section of students (i.e., juniors, seniors and interns) in the teacher education program may lend additional insight into changes in the relationship between social capital and Facebook use over time, especially the transition from the classroom to the internship.

Data Collection

The survey in this study incorporates modified versions of three scales developed and validated by Ellison et al. (2007) which measure the relationship between intensity of Facebook use, bridging social capital and bonding social capital (see Appendix A). The modification to these three scales is limited a single change to the items used in each scale: the word "MSU" was replaced with "College of Education." Also included in the survey were questions measuring attitudes and frequency of several types of Facebook use in the form of both closed and open ended questions.

Changes to questions which replicated those used by Ellison et al. (2007) were limited to a single word change to ensure valid comparisons between the means and standard deviations of the current target population, pre-service teachers, and the greater population of undergraduate college students used in the 2007 study. This comparison is intended to provide insight into the change over time and between groups with regard to Facebook use and social capital.

Measures

The latent variable **Facebook Frequency** was measured using the following *three* survey items. Note that the first item uses a nine-point scale and the second a six-point scale.

1. **About how many total Facebook friends do you have at MSU or elsewhere?**

   Scale: 1=less than 10, 2=11-50, 3=51-100, 4=101-150, 5=151-200, 6=201-250, 7=251-300, 8=301-400, 9=more than 400.

2. **In the past week, on average, approximately how many minutes per day have you spent on Facebook?**

   Scale: 1=less than 10 minutes, 2=10-30 minutes, 3=31-60 minutes, 4=1-2 hours, 5=2-3 hours, 6=more than 3 hours.

3. **Please rate the following:**

   Facebook is part of my everyday activity

   I am proud to tell people I'm on Facebook

   Facebook has become part of my daily routine

   I feel out of touch when I haven't logged onto Facebook for a while

   I feel I am part of the Facebook community

   I would be sorry if Facebook shut down.

   Scale: 1=Strongly Agree, 2=Agree, 3=Not Sure, 4=Disagree, 5=Strongly Disagree

The latent variable **Bonding Social Capital** was measured using the following survey item:

Please rate the following:

There are several people at the College of Education I trust to solve my problems

If I needed an emergency loan of $100, I know someone at the College of Education I can turn to

There is someone at the College of Education I can turn to for advice about making very important decisions

The people I interact with at the College of Education would be good job references for me

I know people at the College of Education well enough to get them to do something important for me.

Scale: 1=Strongly Agree, 2=Agree, 3=Not Sure, 4=Disagree, 5=Strongly Disagree

The latent variable **Bridging Social Capital** was measured using the following survey item:

Please rate the following:

I feel I am part of the College of Education community

I am interested in what goes on at the College of Education

The College of Education is a good place to be

I would be willing to contribute money to the College of Education after graduation

Interacting with people at the College of Education makes me want to try new things

Interacting with people at the College of Education makes me feel like a part of a larger community

I am willing to spend time to support general College of Education activities

At the College of Education, I come into contact with new people all the time

Interacting with people at the College of Education reminds me that everyone in the world is connected

Scale: 1=Strongly Agree, 2=Agree, 3=Not Sure, 4=Disagree, 5=Strongly Disagree

The latent variable **Formal Facebook Use** was measured using the following *two* survey items:

How beneficial have you found the following formal (instructor initiated)

Facebook activities within your experience in the teacher education program?

Facilitate work on a group project (instructor initiated)

As a way to ask or answer school/course related questions of an instructor

Answering discussion questions posted by an instructor

Submitting assignments to an instructor

Getting updates from an instructor

Scale: 1=Never used for this purpose, 2=Not at all beneficial, 3=Moderately beneficial, 4=Very beneficial, 5=Extremely beneficial

In addition to the examples of formal (instructor-initiated) uses in the question above, please describe any other instructor-initiated uses that you have experienced.

The latent variable **Informal Facebook Use** was measured using the following survey item:

How beneficial have you found the following informal (student initiated) Facebook activities within your experience in the teacher education program?

Facilitate work on a group project (student initiated)

Facilitate a study group (student initiated)

As a way to ask or answer school/course related questions of other students

As an alternative to email for communicating with other students in the program

Sharing job related information with other students in the program

Scale: 1=Never used for this purpose, 2=Not at all beneficial, 3=Moderately beneficial, 4=Very beneficial, 5=Extremely beneficial

In addition to the examples of formal (instructor-initiated) uses in the question above, please describe any other instructor-initiated uses that you have experienced.

Additional **Facebook use** not captured in the latent variables above were captured using the following two open-ended survey items:

1. **Please describe any other ways you think you might use Facebook or social media in your job search or ongoing professional development in the future.**

2. **Is there anything else you would like to say about social media in education, including Facebook? Or any comments about this survey?**

Procedures

The anonymous survey was deployed online using SurveyMonkey. All students identified as junior, senior or intern status at the beginning of Fall semester 2015 within the college of education were invited to participate in the survey, 1,102 students in total. A small monetary incentive was included in an attempt to increase participation.

Data Analysis

SPSS was primarily used in the analysis of quantitative data. Qualitative data were transferred to a spreadsheet, reviewed and coded for emergent themes. The following describes the specific types of analyses used to examine each research question.

For research question one, data from the three scales measuring Facebook intensity, bridging social capital and bonding social capital were standardized in order to calculate overall means standard deviations since these items were standardized in the 2007 study. Then, descriptive statistics including means and standard deviations were calculated for individual items and the overall scales. Multiple t-tests (with Bonferroni correction) were used to compare individual and overall scale means. Reliability analyses were also conducted and compared. Because the Facebook intensity scale revealed higher reliability with the removal of a single scale item, number of Facebook friends, principal axis factor analysis with promax rotation was used to examine the factor loadings of this scale.

Research question two used correlation analysis to determine whether a relationship was present and, if so, the strength of that relationship. Interpretation of correlation strength for results in this question and all subsequent correlations was based on the commonly accepted

boundaries suggested by Cohen (1988) where $r<1$.=negligible correlation, $.1<r<.3$=weak correlation, $.3<r<.5$=moderate correlation, $r>.5$=strong correlation.

Research question three utilized a 1-Way ANOVA test to examine differences in the formal and informal Facebook use among juniors, seniors and interns.

Research question four used descriptive statistics to analyze the overall and single item means of the formal and informal use scales. This question also used reliability analysis as well as principal axis factor analysis with promax rotation to examine the factor loadings of each scale individually and together. A correlation table was used to assist in further examination of the strength of the relationships among the four variables of interest, formal/informal Facebook use and bonding/bridging social capital.

Research question five used qualitative methods to analyze the data. A process of abstract category generation through open-coding provided boundaries within which the text data was sorted (Elo & Kyngas, 2008). Themes were generated from emergent categories and compared. Interesting examples were included to illustrate and provide context to the abstract emergent themes.

CHAPTER 4: RESULTS

Demographics

The online survey link was sent via email to 1,102 juniors, seniors and interns in the College of Education at a large Midwestern U.S. university. 81% of the target population was female and 19% were male. Of the 418 who completed the survey, 391 (93.5%) indicated that they had used Facebook at some point during their time in the College of Education (see Figure 2), which resulted in an overall response rate of 35.5%.

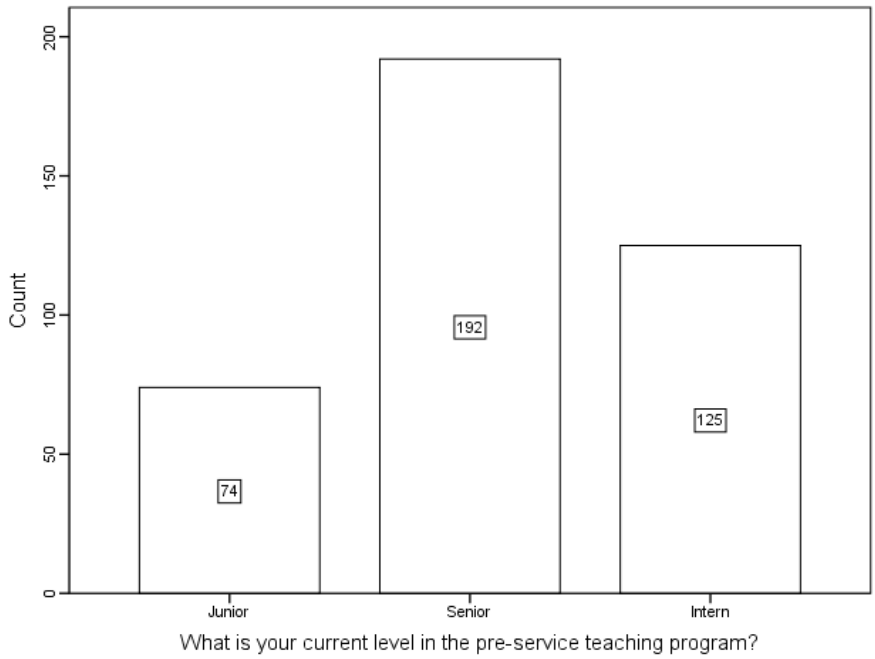


Figure 2. Year/level of pre-service teacher participants.

2007 to 2015: A Comparison of Facebook Use

Facebook intensity and social capital were measured using slightly modified instruments developed by Ellison et al. (2007). Tables and figures of descriptive data are used to examine and compare the 2007 data to the current study. T-tests are also included to help analyze

whether mean differences exist between the overall scales and the individual items which make up the scales.

The current study used Z-score standardization in the Facebook Intensity scale to ensure consistency between measures for comparison purposes since the original instrument used three different scales. Two items used in the Facebook intensity scale in the 2007 study were measured using non-standard scales; number of Facebook friends used a 9-point scale and time spent on Facebook used a 6-point scale. The rest of the questions in this scale used the same 5-point Likert scale. In order to calculate the overall mean and standard deviation of the scale, the 2007 study standardized all items using z-scores. Because of this, the reported overall mean and standard deviation of the Facebook Intensity scale may appear inconsistent with the individual item results.

The Facebook intensity scale. The reliability statistics of the Facebook Intensity scale suggest the variables combine to form a reliable measure of Facebook use, where Cronbach's Alpha = .848 (Table 1). However, factor analysis data (Table 2) suggest that reliability of the scale may be improved slightly if the item *number of Facebook friends* was removed. Data suggests that removing the *number of Facebook friends* item from the Facebook Intensity scale may increase Cronbach's Alpha from **.848 to .867** (see Appendix B). This is the only variable in which this is the case, which led to the question of whether the number of Facebook friends is a necessary variable in measuring overall Facebook Intensity.

Table 1. Facebook intensity scale reliability.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.779	.848	8

Table 2. Pattern Matrix: Factor Analysis of the Facebook Intensity Scale

	Facebook Intensity Scale Factor Loadings	
	1	2
About how many total Facebook friends do you have at MSU or elsewhere?		.667
In the past week, on average, approximately how many minutes per day have you spent on Facebook?	.590	
Facebook is part of my everyday activity	.825	
I am proud to tell people I'm on Facebook	.561	
Facebook has become part of my daily routine	.818	
I feel out of touch when I haven't logged onto Facebook for a while	.744	
I feel I am a part of the Facebook community	.681	
I would be sorry if Facebook shut down	.637	

Extraction Method: Principal Axis Factoring.
Rotation Method: Promax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

Facebook intensity. The bar graph comparison data illustrated in Figure 3 suggests several differences between the 2007 data set and the current study.

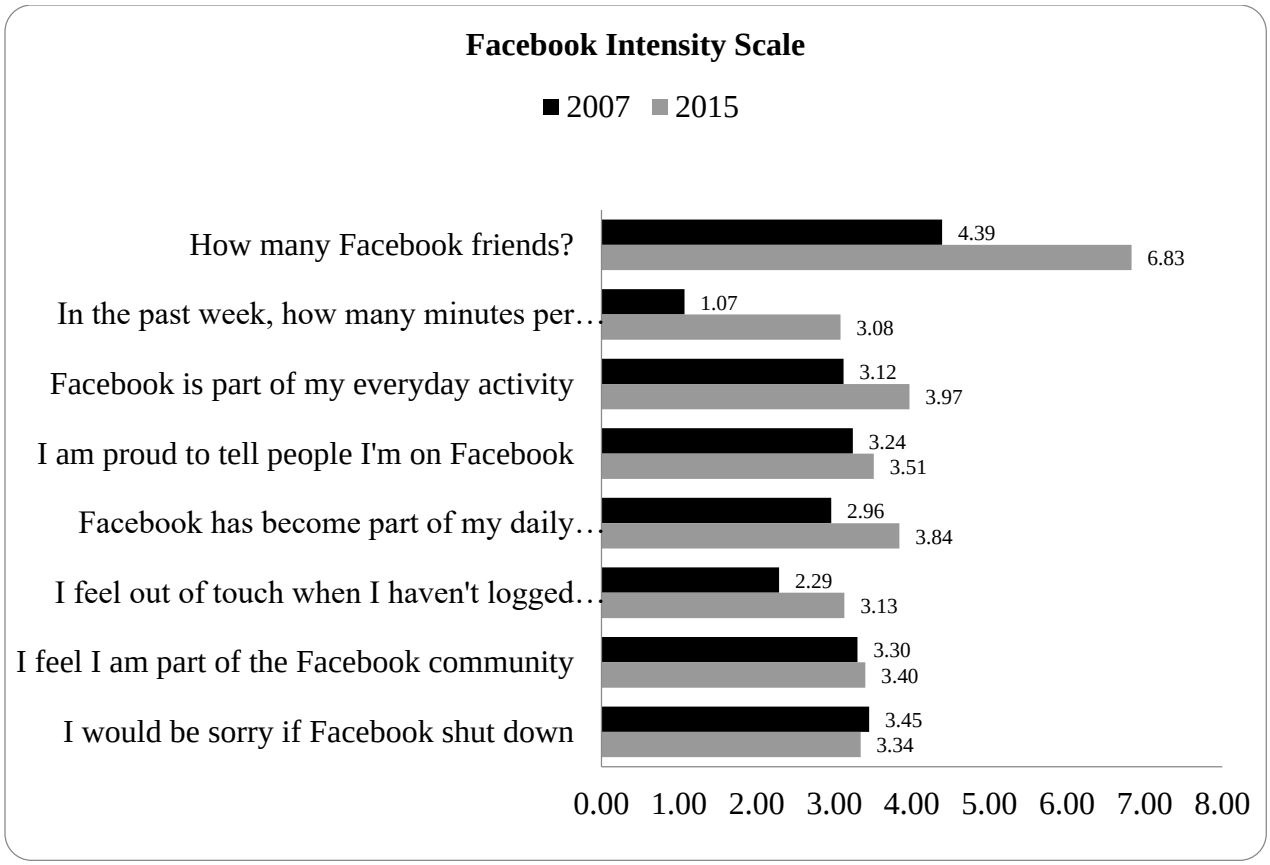
College students in 2007 reported spending less time on Facebook (1.07=less than 10 minutes) than pre-service teachers in 2015 (3.08=31-60 minutes) and did not have as many Facebook friends as pre-service teachers in 2015. In 2007, college students reported having fewer friends (4.39=151-200 friends) than pre-service teachers in 2015 (6.83=251-300 friends). These item statistics suggest that, while the overall Facebook Intensity measure may not be significantly different between 2007 and 2015 ($t(675) = 1.39$, $p=.1638$), overall frequency of Facebook use and the size of individual networks has increased.

For example, current pre-service teachers report spending an average of *31-60 minutes per day on Facebook*, whereas college students reported spending only around *10 minutes per*

day on Facebook in 2007. Pre-service teachers agree that Facebook use has become a part of their daily routine, whereas college students in 2007 somewhat disagreed with this statement.

With regard to the overall significance of difference between the 2007 study and the current study, using the Bonferroni correction (α/n) for estimating significance when multiple t-tests are involved, the significance would have to be less than .00625 (.05/8) in order to reject the null hypothesis that there is not an overall difference between the data sets. T-test results shown in Table 3, where p=.1638, suggest that while there are several items which are below the .00625 threshold, and therefore significantly different, there is not a statistically significant difference in overall Facebook intensity between 2007 and the current study.

The similarities and differences between the data sets appear to align themselves to some extent within a dichotomous pattern. Items in which there is no statistically significant difference appear to align well with ***attitude*** related statements, such as "I would be sorry if Facebook shut down," $t(675) = 1.24$, p=.2154, and "I feel I am part of the Facebook community" $t(675) = 1.25$, p=.2114, . Items in which there are statistically significant differences appear to align well with ***activity*** related items, such as number of Facebook friends $t(675) = 13.29$, $p<.0001$, and amount of use per day $t(675) = 21.09$, $p<.0001$.



How many Facebook friends? *0 = 10 or less, 1 = 11–50, 2 = 51–100, 3 = 101–150, 4 = 151–200, 5 = 201–250, 6 = 251–300, 7 = 301–400, 8 = more than 400*

In the past week, how many minutes per day have you spent on Facebook? *0 = less than 10, 1 = 10–30, 2 = 31–60, 3 = 1–2 hours, 4 = 2–3 hours, 5 = more than 3 hours*

Unless provided, response categories ranged from *1 = strongly disagree to 5 = strongly agree.*

Figure 3. Facebook intensity scale mean comparison.

Table 3. Facebook intensity scale t-test comparison.

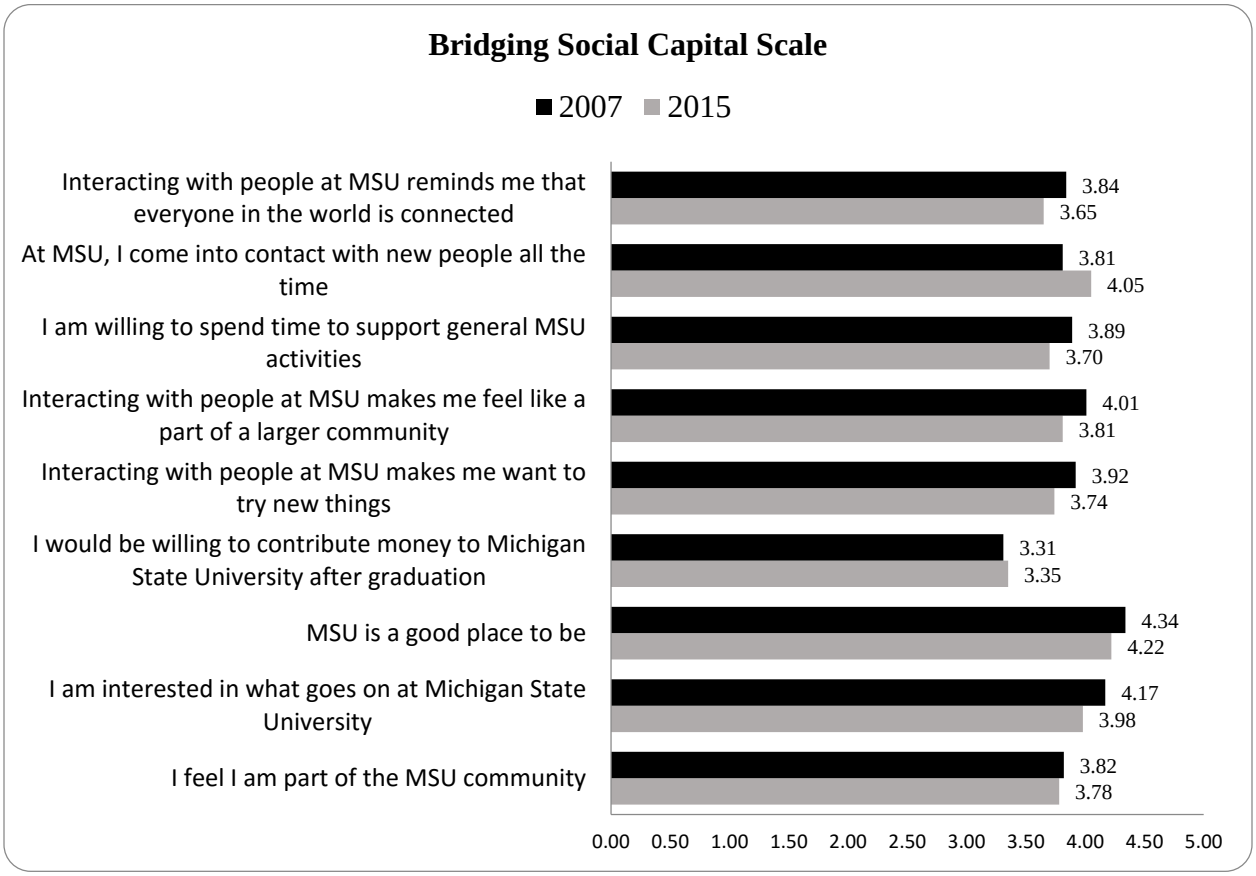
	2007 (n = 286) *Cronbach's Alpha = .83*				**2015 (n = 391)** *Cronbach's Alpha = .78*	
	Mean	S.D.	T-Test	P-value	Mean	S.D.
Facebook Intensity[1]	**-0.08**	**0.79**	**1.39**	**0.1638**	**0.0004**	**0.69**
How many Facebook friends? *0 = 10 or less, 1 = 11–50, 2 = 51–100, 3 = 101–150, 4 = 151–200, 5 = 201–250, 6 = 251–300, 7 = 301–400, 8 = more than 400*	4.39	2.12	13.29	0.0001*	6.83	2.52
In the past week, how many minutes per day have you spent on Facebook? *0 = less than 10, 1 = 10–30, 2 = 31–60, 3 = 1–2 hours, 4 = 2–3 hours, 5 = more than 3 hours*	1.07	1.16	21.09	0.0001*	3.08	1.27
Facebook is part of my everyday activity	3.12	1.26	9.59	0.0001*	3.97	1.04
I am proud to tell people I'm on Facebook	3.24	0.89	3.84	0.0001*	3.51	0.91
Facebook has become part of my daily routine	2.96	1.32	9.65	0.0001*	3.84	1.05
I feel out of touch when I haven't logged into Facebook for a while	2.29	1.20	8.91	0.0001*	3.13	1.22
I feel I am part of the Facebook community	3.30	1.01	1.25	0.2114	3.40	1.04
I would be sorry if Facebook shut down	3.45	1.14	1.24	0.2154	3.34	1.14

Notes: 1. Individual items were first standardized before taking an average to create scale due to differing item scale ranges. 2. Unless provided, response categories ranged from 1 = strongly disagree to 5 = strongly agree.

Bridging social capital. Individual items in the bar graph comparison of bridging capital data between 2007 and the current study in Figure 4 appear to visually indicate similarities among items, and comparative t-test data ($\alpha = .0055$ using the Bonferroni correction) indicate that the overall mean difference between the 2007 and the current data is not statistically

significant. Five items of nine in the bridging scale, highlighted in Table 4, have means which are statistically different (where p <.0055).

Out of the five cases where there is a difference in means, only one has a mean which is lower in the current study, "At MSU/the College of Education, I come into contact with new people all the time." ($t(675) = 3.74$, $p<.0002$).



Note: Response categories ranged from 1 = strongly disagree to 5 = strongly agree

Figure 4. Bridging social capital scale mean comparison.

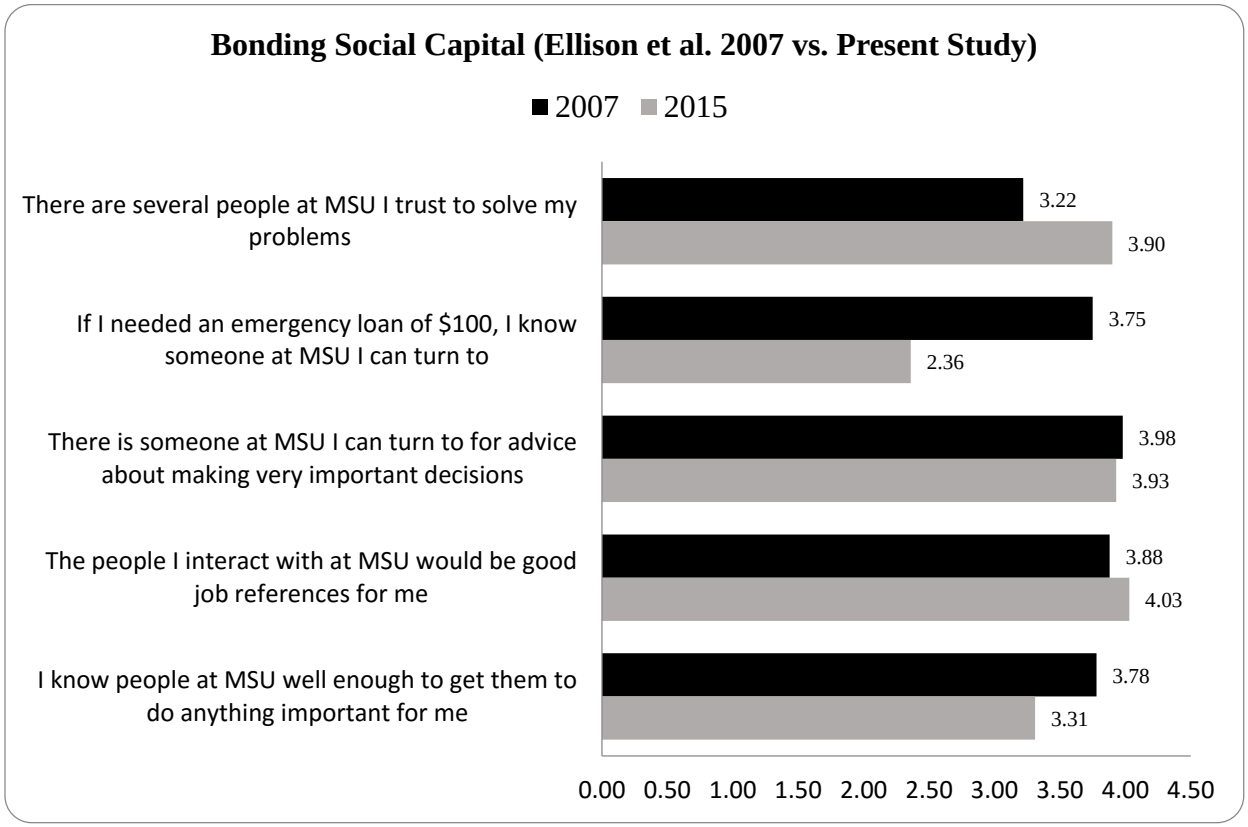
Table 4. Bridging social capital scale t-test comparison.

	2007 (n=286) *Cronbach's Alpha = .87*				**2015 (n=391)** *Cronbach's Alpha = .90*	
	Mean	S.D.	T-Test	P-value	Mean	S.D.
Bridging Social Capital Scale (Overall)	**3.81**	**0.53**	**2.02**	**0.0434**	**3.90**	**0.60**
I feel I am part of the MSU community	3.78	0.80	0.59	0.5554	3.82	0.92
I am interested in what goes on at Michigan State University	3.98	0.64	3.85	**0.0001***	4.17	0.63
MSU is a good place to be	4.22	0.78	2.25	0.0251	4.34	0.61
I would be willing to contribute money to Michigan State University after graduation	3.35	0.95	0.54	0.5863	3.31	0.94
Interacting with people at MSU makes me want to try new things	3.74	0.68	3.05	**0.0024***	3.92	0.81
Interacting with people at MSU makes me feel like a part of a larger community	3.81	0.68	3.45	**0.0006***	4.01	0.79
I am willing to spend time to support general MSU activities	3.70	0.77	3.15	**0.0017***	3.89	0.78
At MSU, I come into contact with new people all the time	4.05	0.69	3.74	**0.0002***	3.81	0.91
Interacting with people at MSU reminds me that everyone in the world is connected	3.65	0.88	2.7	0.0070	3.84	0.92

Note: Response categories ranged from 1 = strongly disagree to 5 = strongly agree

Bonding social capital. According to t-test data in Table 5, the mean difference of the bonding social capital measure between the 2007 study and the current study is statistically significant $t(675) = 3.99$, $p<.0001$. The only two items in this scale which do not differ statistically are the statements, “There is someone at MSU/the College of Education I can turn to

for advice about making very important decisions" $t(675) = .63$, $p=.5268$, and "The people I interact with at MSU/the College of Education would be good job references for me" $t(675) = 2.35$, $p=.0189$. The largest mean item difference in this scale is the statement, "If I needed an emergency loan of $100, I know someone at MSU/the College of Education I can turn to." The graph in Figure 5 provides a visual illustration of this difference.



Note: Response categories ranged from 1 = strongly disagree to 5 = strongly agree

Figure 5. Bonding social capital scale mean comparison.

Table 5. Bonding social capital t-test comparison.

	2007 (n = 286) *Cronbach's Alpha = .75*				**2015 (n = 391)** *Cronbach's Alpha = .83*	
	Mean	S.D.	T-Test	P-value	Mean	S.D.
Bonding Capital Scale	**3.72**	**0.66**	**3.99**	**0.0001***	**3.50**	**0.74**
There are several people at MSU, the College of Education I trust to solve my problems	3.22	1.01	9.6	**0.0001***	3.90	0.83
If I needed an emergency loan of $100, I know someone at MSU/the College of Education I can turn to	3.75	1.09	16.31	**0.0001***	2.36	1.12
There is someone at MSU/the College of Education I can turn to for advice about making very important decisions	3.98	0.85	0.63	0.5268	3.93	1.12
The people I interact with at MSU/the College of Education would be good job references for me	3.88	0.79	2.35	0.0189	4.03	0.84
I know people at MSU/the College of Education well enough to get them to do anything important for me	3.78	0.87	6.14	**0.0001***	3.31	1.06

Note: Response categories ranged from 1 = strongly disagree to 5 = strongly agree

Social capital and Facebook intensity. The correlation between *Facebook Intensity* and *Bonding Capital* in the current study was r=.13, p<.05, whereas in the 2007 study by Ellison et al. the correlation was r=.37, p< .0001. The correlation between *Facebook Intensity and Bridging Capital* in the current study was r=.19, p<.01, whereas in the 2007 study by Ellison et al. it was r=.34, p< .0001. The data indicate that Facebook use was weakly correlated with both bridging and bonding social capital among pre-service teachers whereas social capital was moderately correlated with Facebook use among college students in 2007 (see Tables 6, 7 and 8).

Table 6. Correlation comparison: Facebook and social capital.

	2007	2015
Correlation between Facebook Intensity and Bridging Capital	.34	.19
Correlation between Facebook Intensity and Bonding Capital	.37	.13

Table 7. Correlation: Facebook intensity and bonding capital.

		Bonding Capital
Facebook Intensity	Pearson Correlation	.126*
	Sig. (2-tailed)	.012
	N	391

*. Correlation is significant at the 0.05 level (2-tailed).

Table 8. Correlation: Facebook intensity and bridging capital.

		Bridging Capital
Facebook Intensity	Pearson Correlation	.185**
	Sig. (2-tailed)	.000
	N	391

**. Correlation is significant at the 0.01 level (2-tailed).

Facebook use, program level and social capital

A 1-way ANOVA (Table 9) test suggests that Facebook Intensity among the different levels of pre-service teachers is not significantly different. It appears there may exist a significant difference in Facebook intensity between juniors and interns where $p<.05$ (Table 10).

Table 9. ANOVA Summary: Facebook Intensity across level in school.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.162	2	1.081	2.254	**.106**
Within Groups	186.051	388	.480		
Total	188.213	390			

Table 10. ANOVA table: Facebook intensity across level in school.

LSD

					95% Confidence Interval	
(I) Level?	(J) Level	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Junior	Senior	.110	.010	.248	-.080	.300
	Intern	.213*	.102	**.037***	.013	.413
Senior	Junior	-.110	.010	.248	-.300	.080
	Intern	.103	.080	.196	-.053	.300
Intern	Junior	-.213*	.102	**.037***	-.413	-.013
	Senior	-.103	.080	.196	-.300	.053

*The mean difference is significant at the 0.05 level.

This finding prompted further investigation into possible differences between juniors and interns with regard to the relationship between Facebook intensity and social capital. Further analyses indicate that the correlations between Facebook intensity and social capital are weaker than the overall mean at the junior (bonding: r=.037, bridging: r=.144) and intern levels (bonding: r= .060, bridging: r=.092), while these correlations are statistically significant and higher at the senior level (bonding: r=.223, $p<.01$, bridging r=.247, $p<.01$), though still considered weak.

Table 11. Correlations: Facebook Intensity and Social Capital (Juniors)

		Bonding Capital	Bridging Capital
Facebook Intensity	Pearson Correlation	.037	.144
	Sig. (2-tailed)	.752	.221
	N	74	74

Table 12. Correlations: Facebook Intensity and Social Capital (Seniors)

		Bonding Capital	Bridging Capital
Facebook Intensity	Pearson Correlation	.223**	.247**
	Sig. (2-tailed)	.002	.001
	N	192	192

**. Correlation is significant at the 0.01 level (2-tailed).

Table 13. Correlations: Facebook Intensity and Social Capital (Interns)

		Bonding Capital	Bridging Capital
Facebook Intensity	Pearson Correlation	.060	.092
	Sig. (2-tailed)	.509	.310
	N	125	125

Formal and Informal Facebook Use

Description of the scales. Two scales were developed to measure attitudes toward different types of Facebook use among teacher education students. The scale items were developed through an open coding process of pre-existing qualitative data on pre-service teacher

Facebook use. Coding of open-ended responses yielded several patterns of Facebook use, which became the individual items in the formal and informal use scales, and a categorical dichotomy which became the formal and informal Facebook use measurement instruments. The instruments serve two measurement purposes: 1. Measure the prevalence of Facebook use among pre-service teachers for the indicated purposes. 2. Measure attitudes toward using Facebook for each indicated purpose.

For pre-service teachers who indicated they have used Facebook for the purposes specified in each scale, the rating question asked, "How beneficial have you found the following formal/informal (instructor initiated/student initiated) uses of Facebook activities within your experience in the teacher education program?"

The formal Facebook scale used a 5-point Likert scale with the following rating system: 0 = Never used for this purpose, 1 = Not at all beneficial, 2 = Moderately beneficial, 3 = Very beneficial, 4 = Extremely beneficial. (Individuals reporting never having used for this purpose were treated as missing data.)

The Formal Facebook Use scale consists of the following questions:

1. Facilitate work on a group project
2. As a way to ask or answer school/course related questions of an instructor
3. Answering discussion questions posted by an instructor
4. Submitting assignments to an instructor
5. Getting updates from an instructor

The informal Facebook scale used a 6-point Likert scale with the following rating system:

0 = Never used for this purpose, 1= Not at all beneficial, 2 = Slightly beneficial, 3 = Moderately beneficial, 4 = Very beneficial, 5 = Extremely beneficial. (Individuals reporting never having used for this purpose were treated as missing data.)

The Informal Facebook Use scale consists of the following questions:

1. Facilitate work on a group project (student initiated)
2. Facilitate a study group (student initiated)
3. As a way to ask or answer school/course related questions of other students
4. As an alternative to email for communicating with other students in the program
5. Sharing job related information with other students in the program

Formal/informal use scale analysis. Reliability analysis data suggest that the formal Facebook use attitude scale (Table 14) and the informal Facebook use attitude scale (Table 15) are each highly reliable.

Table 14. Reliability: Formal Facebook use scale.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.818	.820	5

Table 15. Reliability: Informal Facebook use scale.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.914	.916	5

A factor analysis was performed on both the informal and formal use scale in an effort to determine on how many factors each scale loads. Factor analysis of both the formal and

informal scales (Table 16) suggest that items in each scale load independent of one another and within the scale from which they reside.

Table 16. Pattern Matrix: Factor analysis of formal and informal Facebook use scales.

	Factor Loadings	
	Informal Facebook Use	Formal Facebook Use
Facilitate work on a group project		.482
As a way to ask or answer school/course related questions of an instructor		.686
Answering discussion questions posted by an instructor		.742
Submitting assignments to an instructor		.882
Getting updates from an instructor		.598
Facilitate work on a group project (student initiated)	.892	
Facilitate a study group (student initiated)	.854	
As a way to ask or answer school/course related questions of other students	.906	
As an alternative to email for communicating with other students in the program	.883	
Sharing job related information with other students in the program	.528	

Extraction Method: Principal Axis Factoring.
Rotation Method: Promax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

Descriptive Statistics – Formal Use. As shown in Table 17, reported attitudes for each formal use scale item fall within one standard deviation of the mean. Individual item attitude means suggest that pre-service teachers believe the most beneficial formal use of Facebook is getting updates from an instructor (2.61 = Moderately to Very Beneficial). Asking and answering questions (2.58= Moderately to Very Beneficial) and facilitating work on group projects (2.46= Moderately to Very Beneficial) follow close behind. The data also suggest a possible relationship between the number of pre-service teachers who have experienced each

particular use and their attitudes toward that use; in other words, as N increases, so does mean attitude. The overall mean of pre-services teachers' attitudes toward formal Facebook use is 2.42, which means on average they find formal Facebook use **moderately to very beneficial**.

Overall, the data showed that pre-service teachers have positive attitudes toward formal uses of Facebook by instructors in courses, but these positive attitudes toward formal uses in courses are not strongly related to the amount of social capital reported by these students. The correlation (Table 21) between attitudes toward *formal Facebook* use and *bonding social capital* was r=.230, p< .01, a weak correlation, and the correlation between attitudes toward *formal Facebook use* and *bridging social capital* was r=.319, p<.01, a moderate correlation.

Table 17. Mean attitudes toward formal Facebook use.

	N	Mean	Std. Deviation
Overall	**279**	**2.42**	**.669**
Facilitate work on a group project	224	2.46	.757
As a way to ask or answer school/course related questions of an instructor	236	2.58	.860
Answering discussion questions posted by an instructor	197	2.38	.828
Submitting assignments to an instructor	138	2.07	.940
Getting updates from an instructor	228	2.61	.861

Four-point scale: 1 = Not at all beneficial, 2 = Moderately beneficial, 3 = Very beneficial, 4 = Extremely beneficial

Descriptive Statistics – Informal Use. As shown in Table 18, reported attitudes for each informal use scale item also fall within approximately one standard deviation of the mean. The overall mean for attitudes toward informal Facebook use is 3.546, which means that students' attitudes toward informal Facebook use are also moderately to very beneficial.

Individual item attitude means suggest that pre-service teachers find informal uses approximately equally useful (Table 18), with the exception of sharing job related information

with other students in the program. A bar chart is included (Figure 6) to visually illustrate the mean differences between these groups (juniors, seniors and interns). The data in Figure 6 suggests that mean attitudes toward sharing job related information slightly increases from junior to senior to internship year.

Table 18. Mean attitudes toward informal Facebook use.

	N	Mean	Std. Deviation
Overall	**373**	**3.55**	**.977**
Facilitate work on a group project (student initiated)	343	3.58	1.076
Facilitate a study group (student initiated)	324	3.53	1.105
As a way to ask or answer school/course related questions of other students	348	3.68	1.108
As an alternative to email for communicating with other students in the program	354	3.80	1.111
Sharing job related information with other students in the program	274	3.26	1.194

1= Not at all beneficial, 2 = Slightly beneficial, 3 = Moderately beneficial, 4 = Very beneficial, 5 = Extremely beneficial

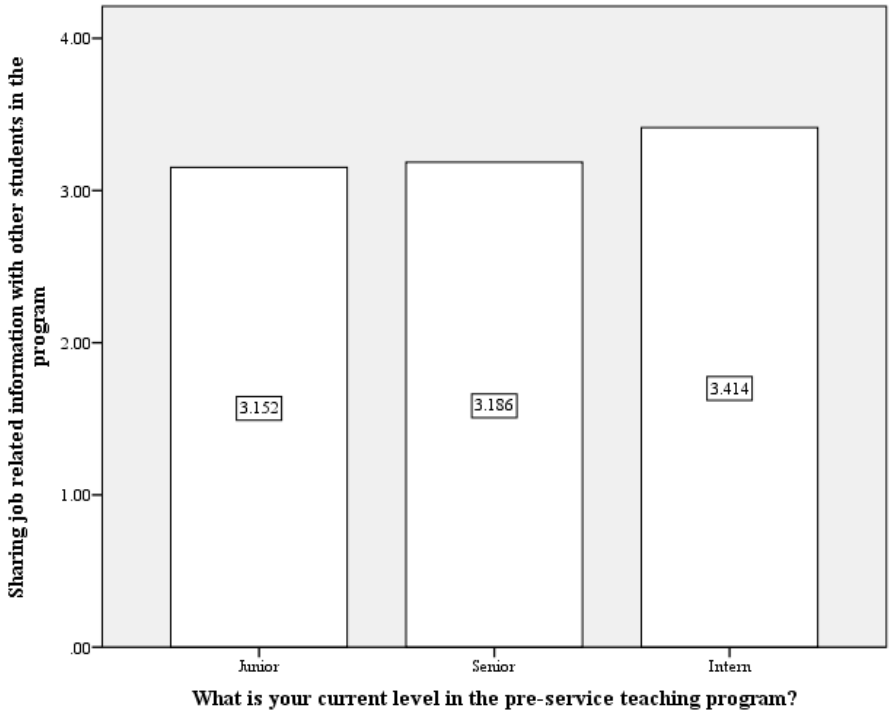


Figure 6. Mean attitudes toward sharing job related information via Facebook by level.

The correlations (Table 21) between attitudes toward *informal Facebook use* and *bonding social capital* was r=.149, p<.01, and the correlation between attitudes toward *informal Facebook use* and *bridging social capital* was r=.199, p<.01 among pre-service teachers.

Formal and informal use comparison.The overall *N* for informal Facebook use is 373 while formal Facebook use is 279. This means that 95.4% of pre-service teachers' report having used Facebook in some informal way (e.g., while 71.4% of pre-service teachers' report having used Facebook in some formal way in the college of education. Though experience with informal use is more common than formal use, overall attitudes toward each type of use seem to be roughly equal, *moderately to very beneficial*.

With regard to differences among pre-service teachers' attitudes toward formal and informal Facebook use, a 1-way ANOVA test of informal (Table 19) and formal (Table 20)

Facebook use among juniors, seniors and interns indicates that there exist no significant differences between groups for both formal and informal Facebook use.

Table 19. ANOVA: Informal Facebook use across level in school.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.362	2	2.181	2.303	**.101**
Within Groups	350.359	370	.947		
Total	354.721	372			

Table 20. ANOVA: Formal Facebook use across level in school.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.160	2	.080	.178	**.837**
Within Groups	124.469	276	.451		
Total	124.629	278			

Overall, the data showed that pre-service teachers had positive attitudes toward both formal and informal uses of Facebook, but that these positive attitudes were not strongly related to the amount of social capital reported. Although statistically significant, data indicate weak relationships between pre-service teachers' attitudes toward informal Facebook use and social capital and moderate correlations between pre-service teachers' attitudes toward formal Facebook use and bridging and bonding social capital.

Facebook use, attitudes, and social capital

While the overall relationship between Facebook use among pre-service teachers and bonding and bridging social capital could be categorized as weak to moderate, the data indicate several significant relationships among other variables of interest in the current study (Table 21). Moderate correlations (r>.3) are present in the relationships among the following variables:

bonding social capital and *bridging social capital* (*r*=.641, *p*<.01), attitudes toward *formal Facebook use* and *informal Facebook use* (*r*=.483, *p*<.01), attitudes toward *formal Facebook use* and *bridging capital (r*=.319, *p*<.01) and attitudes toward *informal Facebook use* and *Facebook intensity* (*r*=.302, *p*<.01).

Table 21. Correlations: Social capital and Facebook use.

		Bonding Capital	Bridging Capital	Informal Facebook Use	Formal Facebook Use	Facebook Intensity
Bonding Capital	Pearson Correlation		**.641****	.149**	.230**	.126*
	Sig. (2-tailed)		.000	.004	.000	.012
	N		391	373	279	391
Bridging Capital	Pearson Correlation			.199**	**.319****	.185**
	Sig. (2-tailed)			.000	.000	.000
	N			373	279	391
Informal Facebook Use	Pearson Correlation				**.483****	**.302****
	Sig. (2-tailed)				.000	.000
	N				276	373
Formal Facebook Use	Pearson Correlation					.205**
	Sig. (2-tailed)					.001
	N					279

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).
Moderate (.3<*r*<.5) and *Strong* (*r*>.5) correlations are bolded.

Qualitative Data Analysis

Overview. Qualitative data was collected from four open-ended survey questions. This data was collected in follow up to research questions 4.1 and 4.2 in an effort to capture attitudes

and additional ways in which Facebook may be used in the teacher education program not captured by the "Formal" and "Informal" Facebook use scales.

Two follow-up questions were designed to capture formal/informal uses of Facebook not present in the formal/informal Facebook attitude scales:

1. In addition to the examples of **formal** (instructor-initiated) uses in the question above, please describe any other instructor-initiated uses that you have experienced.
2. In addition to the examples of **informal** (student-initiated) uses in the question above, please describe any other student-initiated uses that you have experienced.

Two follow-up questions, designated in the analysis below as "Other reported Facebook uses" were designed to capture attitudes toward Facebook use in pre-service teacher education beyond the formal/informal boundaries:

1. Please describe any other ways you think you might use Facebook or social media in your job search or ongoing professional development in the future.
2. Is there anything else you would like to say about social media in education, including Facebook?

The following is an analysis of these four follow-up questions.

Reported formal Facebook uses. Three categories under the central theme of *sharing* emerged from the responses of 30 pre-service teachers who responded to this question. The categories, along with the number of students reporting each use, include the following: 1. Pre-service teachers report using Facebook for peer reviewing course work (4). 2. Facebook is being used to share content to extend course ideas and objectives (19). 3. Facebook is being used for sharing student work with others (9). (Two students reported use in more than one category.)

The following coding scheme emerged in the open-coding process: 6 = Peer review; 7 = Sharing extension ideas/content; 8 = Sharing work with others.

Example coded responses illustrating the theme of sharing as well as the three emergent categories include the following (see *Appendix C* for additional examples):

- "I had a class were the instructor create a group for everyone in the class. The students were able to introduce themselves on the page, ask other members questions about classwork, receive feedback, etc." (6)
- "Posting pictures of projects we do in class and giving feedback to other classmates work." (6)
- "In one of my classes we use Facebook to comment on each other's work." (6)
- "One of my instructors has used Facebook for our class to post pictures and videos of things we have done in class." (8)
- "I have had professors post articles and supplementary materials onto our Facebook page. They also included job listings and news about our subject area." (7)

Reported informal Facebook uses. Two categories which also fell under the central theme of *sharing* emerged from the responses of 40 pre-service teachers who responded to this question. The categories, along with the number of pre-service teachers reporting each use, include the following: 1. Facebook is being used by pre-service teachers for sharing non-course related education information (15). 2. Facebook is also being used by pre-service teachers for peer support (25).

The following scheme emerged in the open-coding process: 6 = Sharing non-course information; 7 = Peer support.

Example coded responses illustrating the theme of sharing as well as the two emergent categories include the following (see *Appendix C* for additional examples):

- "Right now my TE 407 section has a Facebook group, and we've invited students from the other section as well. I feel as though it's bringing us closer together, making communication about assignments much easier, and helping to create a sense of community that carries over to the classroom. We have so far used it to plan one non-academic event where we could all get together and get to know each other outside of the classroom." (7)
- "The options described my experiences well; additionally, be friends [sic] with other TE students helps relieve stress. We have fun and support each other." (7)
- "I belong to a Facebook group of my fellow math interns, and it is the primary reason I still use Facebook. I am able to ask questions to anyone in my class, and we as a group are able to answer each other's questions and set up meetings. If this group did not exist on Facebook, I would not have a Facebook, nor would I feel as connected to my fellow interns." (7)
- "We used facebook in our cohort to create a community and support group. We frequently post about the happenings in our specific placement schools, ask questions about assignments and due dates and post encouraging or discouraging events that we have encountered to hear it from different perspectives." (7)
- "Our TE Eng Ed Interns have a Facebook group where we post about everything from problems/successes in the classroom, MSU homework questions, job postings, motivational quotes, and random Spartan pride things. It has [been] more beneficial and helpful than anything else in the college of Ed." (7)

The theme of sharing appears to underlie the informal use categories as well. In aggregate, this qualitative data may provide useful insight into particular ways in which social network sites such as Facebook may, or may not, be useful in pre-service teacher education.

Other reported Facebook uses. Four themes emerged from a careful reading and categorizing of these two questions. Two themes emerged that expressed concern: Separating personal and professional online presence, and fear of looking unprofessional. Two themes emerged expressing positive uses of Facebook: Keeping in touch with cohort members and professional groups, and following professional organizations for professional development and job related purposes.

1. **Separating personal/professional online social presence (e.g., LinkedIn for professional, Facebook for personal).**
    - "I personally tend to hesitate to link my social media like facebook [sic], or my personal twitter (not professional) act [sic] because I like to keep some aspects of my life separated at least a little bit. I recognize that employers might search or look at my social media and I have nothing to be worried or ashamed about through my social media, but I like to picture my life with different spheres between work and home and family and social that cross all the time but how I allow them to."
    - I don't use Facebook in education, I think every person in the history of the world has told me to keep social media and my education separate as education equals jobs and social media can be detrimental to job prospects."
2. **Fear of seeming unprofessional because they are using Facebook.**

- "Facebook is seen as a liability, so the only way I would use it in searching for jobs is to make sure it looks professional in case a potential employer looks at it."
- "I feel as though Facebook is seen as "unprofessional" even though it is a great way to make connections. Maybe if more people saw it as a way to connect versus as [sic] being unprofessional, we could take advantage of it."

3. **Good way to keep in touch with cohort members and former instructors for information purposes.**
    - "To communicate with old TE classmates and exchange ideas about lesson planning"
    - "Having an informal Facebook group for the subject specific section of my cohort really helped the cohort bond."
4. **Following professional organizations for PD and job related information.**
    - "I think it is helpful when you follow the College of Education on social media because oftentimes they are posting information that I had previously not heard before. I think that it would potentially be useful for finding jobs especially if you are connected to teachers in a specific district that you as a job candidate are interested in."

CHAPTER 5: DISCUSSION

Discussion of the Results

The aim of this investigation was two-fold: 1. Replicate the study by Ellison et al. (2007) on the impact of Facebook on social capital among college students. 2. Examine students' reports of pedagogical uses of Facebook, both formal and informal, within their teacher education program. Following is a summary of findings, an examination of the limitations of this research, as well as a discussion of the implications of this study on teacher education and directions for future research. Discussion and interpretation of correlations uses the following guidelines suggested by Cohen (1988): $r<1$.=negligible correlation, $.1<r<.3$=weak correlation, $.3<r<.5$=moderate correlation, $r>.5$=strong correlation.

Facebook intensity: 2007-2015. It is interesting that despite the rise and spread of non-Facebook SNSs such as LinkedIn and Twitter, attitudes toward using Facebook among college students in the 2007 study and pre-service teachers in the current study appear to be stable. With 93.5% of pre-service teachers sampled in this study reporting active Facebook use, it would appear that Facebook is still a fertile ground for research on the affordances of social network sites (Nicole B. Ellison et al., 2007). College students have an ongoing desire to connect with one another, as evidenced by statistics collected in the 2007 study and the current study.

Overall, there was not a significant difference in overall Facebook intensity between college students in 2007 and pre-service teachers in the current study. However, the Facebook activity of pre-service teachers in 2015 was higher than that of college students in 2007. College students in 2007 spent less than 10 minutes per day on Facebook than pre-service teachers in 2015 who reported spending 31-60 minutes per day on the social network site. Pre-service teachers also reported having substantially more Facebook friends than college students in the

2007 study. Attitudes toward Facebook use, as measured in the Facebook Intensity scale, remain mostly unchanged between college students in 2007 and pre-service teachers in 2015. It was not entirely unexpected that the college students measured in the study by Ellison et al. in 2007 did not have as many friends on the site or use it as much as pre-service teachers in 2015 since Facebook was new at this time.

Pre-service teachers did not differ in their Facebook use across year (i.e., junior, senior, intern) in the teacher education program. This was interesting when considering that the interns who participated in the current study may have less free time than the undergraduates. The interns in the current study are engaged in classroom observations, teaching and graduate level course work.

Bridging and bonding social capital: 2007-2015. There was no statistical difference in the amount of bridging social capital reported by college students in 2007 and pre-service teachers in 2015. This was a somewhat unexpected finding since, intuitively, one might assume that since pre-service teachers' networks are larger than college students in 2007, there would be an increase in their overall social capital, especially bridging (Nicole B. Ellison et al., 2007). The only individual Bridging Social Capital scale item which was statistically significantly different and lower for pre-service teachers' than college students in 2007 were responses to the statement, "At MSU/the College of Education, I come into contact with new people all the time." ($t(675) = 3.74$, $p<.0002$). Use of cohorts within the College of Education may explanation this finding. As Maier & Youngs (2009) suggested, the accrual of social capital is majorly influenced by social structure. This might indicate that pre-service teachers are somewhat insulated from the rest of the University, which one might expect to lead to an increase in bonding social capital among pre-service teachers.

However, mean bonding capital among pre-service teachers was lower than that of college students in 2007. This finding was unexpected given the emphasis in the teacher education program on cohorts, which previous research has suggested promotes bonding social capital among pre-service teachers (Mandzuk et al., 2003). Individual bonding social capital items which were not significantly different between pre-service teachers and the 2007 college students included responses to the following statements: "There is someone at MSU/the College of Education I can turn to for advice about making very important decisions," and "The people I interact with at MSU/the College of Education would be good job references for me." It would appear that between 2007 and 2015 some types of bonding social capital which inhere calls for assistance have not changed while others have drastically changed.

For example, the individual bonding social capital scale item with the largest mean difference between 2007 and 2015 emerged in responses to the statement, "If I needed an emergency loan of $100, I know someone at MSU/the College of Education I can turn to." On the 1-5 Likert scale ranging from 1=strongly disagree to 5=strongly agree, the overall mean for college students in 2007 on this item was 3.75, while the overall mean for pre-service teachers in the current study was 2.36. Pre-service teachers seemed to lean toward the "disagree" end of the scale while college students in 2007 leaned much closer to the "agree" end of the scale. The reason for focusing on this single item from the bonding social capital scale is that this result, coupled with the difference in means between these two groups, may indicate that social capital exchanges among pre-service teachers are not only be quantitatively lower for pre-service teachers in the current study than for college students in 2007, but characteristically different.

The stability of attitudes toward Facebook use and mean bridging social capital coupled with increases in number of friends and time spent on Facebook suggested that pre-service

teachers have extended their bridging (weak) social network ties through Facebook more than college students in 2007. Extending one's weak ties, according to Granovetter (1995), may have the added benefit (among others) of assisting with tasks such as job searching, a benefit likely welcomed by interns.

However, Facebook Intensity was weakly correlated with Bridging Social Capital (.19) as well as Bonding Social Capital (.13) among pre-service teachers. These relationships were much weaker than those of college students in 2007, where Ellison et al. (2007) found moderate correlations between Facebook intensity and bridging (.34) and bonding (.37) social capital. As the data suggest, pre-service teachers are exchanging social capital on Facebook and likely benefitting from these exchanges, but the relationship between reported levels of social capital and Facebook use are unexpectedly low. This may suggest a need to measure and study social capital among pre-service teachers in a slightly different way.

As will be discussed in the following sections, the accrual and exchange of social capital among pre-service teachers may be characteristically different than that of college students and may therefore require a more nuanced examination in order to explore ways in which Facebook may or may not be useful in the pre-service teacher education classroom.

The formal and informal Facebook use scales. Two new scales were developed to capture students' reports of formal and informal uses of Facebook. Each scale indicated high reliability and consistent factor item loadings for each latent variable measured, formal and informal Facebook use. Students were asked to report their attitudes toward five different types of Facebook uses initiated by instructors (formal) and five different types of uses initiated by students (informal) (these are described in detail in the measures section).

Formal and informal Facebook use comparison. On average, pre-service teachers had positive attitudes toward both formal and informal Facebook use. According to the scales they found these uses *moderately* to *very beneficial*. It was interesting that the overall mean attitude toward informal Facebook use was similar to formal Facebook use - moderately to very beneficial. This suggests that whether exposure to Facebook in the teacher education program is required or voluntary, it was viewed as being a positive experience.

Equally interesting was the fact that pre-service teachers reported much more participation in informal activities (n=373) than formal activities (n=279). Informal uses are by definition unassigned activities, whereas formal uses are typically part of an in-class assignment. Substantially fewer students reported "Submitting assignments to an instructor" in the formal Facebook scale (n=138). The mean attitude toward using Facebook to hand in assignments was 2.07, indicating pre-service teachers' attitudes toward using Facebook in this way bordered on being considered "Not at all beneficial."

The lowest reported informal Facebook use was "Sharing job related information with other students in the program" (n=274). The mean attitude toward this use was moderately to very beneficial (3.26). Interns reported better attitudes toward this use than any other group (3.41). This was not surprising since interns are closer to the job market than juniors or seniors surveyed in this study.

One use that appeared to be the most popular and highest rated among pre-service teachers in both the formal and informal attitude scales was asking and answering questions. Asking and answering questions represented the highest mean attitudes in both the formal and informal Facebook use scales. This was especially interesting because asking and answering questions is a reciprocal transaction common in the exchange of social capital over social

network sites such as Facebook, and can contribute to community building (Nicole B Ellison, Gray, Lampe, & Fiore, 2014).

Even though there appeared to be weak correlations between Facebook intensity and bridging and bonding social capital among pre-service teachers, the qualitative data (discussed below and illustrated in Appendix C) as well as quantitative data from the formal/informal attitude scales provide additional insight into both the positive and negative ways in which pre-service teachers use Facebook.

Attitudes toward formal and informal Facebook use. Attitudes regarding formal and informal Facebook use reported by pre-service teachers yielded several interesting relationships. For example, the correlation between pre-service teachers' attitudes toward Formal Facebook Use and Informal Facebook Use was strong. This was not surprising since pre-service teachers' mean attitudes toward formal and informal Facebook use were each positive to similar degrees. This finding might suggest that even though fewer pre-service teachers reported experience using Facebook formally within the teacher education program, such use could prove profitable, assuming pre-service teachers' attitudes are an indicator of acceptance and usefulness.

However, enthusiasm over the positive attitudes among pre-service teachers and the strong correlation between formal and informal Facebook use should be tempered with recognition that some aspects of formal Facebook integration may not be met with such enthusiasm. For example, medical students in the Gray et. al. (2010) study regarded their own informal Facebook use as intentionally existing outside the formal confines and control of the classroom and instructor. Medical students' attitudes were that formal instructor intervention in this space would have a negative impact on its usefulness. As Velasquez et. al. (2009) noted, some college students also believe that their personal and academic lives are separate and that

formal instructor led uses of Facebook may intermix these two worlds making participation uncomfortable. This finding was also observed in the qualitative data of the current study (see results section and Appendix C). The perception of mixing personal and professional, or academic, "lives" was a recurring concern among college students as well as pre-service teachers. Formal Facebook use which is too prescriptive (e.g., limited to giving out or handing in assignments) was also viewed by some college students as not being useful (O'Bannon et al., 2013).

Acknowledging the potential negative consequences of formally integrating Facebook into a teacher education course is not intended to dissuade pre-service teacher educators from considering this endeavor, but rather to guide consideration into the most profitable decision possible.

The positive attitudes of pre-service teachers in the current study were limited by the individual items which comprised the latent variables Formal Facebook Use and Informal Facebook Use. Formal use attitude measures were limited to using Facebook for facilitating work on instructor led group projects, Q&A with instructors, answering discussion questions posted by an instructor, submitting assignments to an instructor and getting updates from an instructor. Informal Facebook use attitude measures were limited to using Facebook for facilitating student led work on group projects, forming study groups, Q&A among students, as an alternative to email, and sharing job related information. Thus, pre-service teacher educators should weigh the strength and nature of these positive attitudes against uses which could be potentially seen as negative in attempting to achieve a productive balance when integrating social network sites into the classroom.

Social capital and formal/informal Facebook use. The correlation between bonding social capital and bridging social capital among pre-service teachers was r=.641, p<.01. In simple terms, pre-service teachers who have one type of social capital tend to have the other. However, neither type of social capital appeared to result from Facebook use among pre-service teachers. For example, bridging social capital between pre-service teachers and the college students in the 2007 study did not significantly differ, despite the pre-service teachers' larger number of Facebook friends. One might expect an increase in Facebook friends to translate into an increase in bridging capital, but this was not the case. Coupled with the unexpected finding that bonding social capital levels were lower among pre-service teachers than college students in 2007, and the weak correlations between Facebook use and social capital among pre-service teachers, it is posited that social capital exchanges among pre-service teachers' may be happening outside of Facebook and/or within the more nuanced framework of formal and informal Facebook use.

For example, moderate correlations were present in the relationships between the variables Informal Facebook Use and Facebook Intensity. Essentially, the more pre-service teachers used Facebook, the more positive their attitudes toward the informal uses, as measured in the survey. Since informal use is entirely voluntary, it might make sense that increased use would translate into more positive attitudes toward this use. This could suggest that pre-service teachers who are active on Facebook are forming the types of informal communities described by Greenhow et al. (2015) and augmenting their educational experience within these groups.

Moderate correlations were also present between the variables Formal Facebook Use and Bridging Social Capital. This correlation might make intuitive sense since pre-service teachers required to interact with a larger group on a social network site where they have "*uniquely*

identifiable profiles that consist of user-supplied content… can *publicly articulate connections* that can be viewed and traversed by others… and can consume, produce, and/or interact with *streams of user-generated content* provided by their connections on the site" (N. B. Ellison & boyd, 2014, p. 158). In contrast with other electronic methods of communication such as email, social network sites such as Facebook afford the unique ability for users, in this case pre-service teachers, to interact and potentially expand their social networks. In the case of formal Facebook use in this example, it is possible that these networks are traversing between both bridging and bonding social capital.

Though the correlation between Bridging Social Capital and Formal Facebook Use (r=.32, p<.01) was stronger than the correlation between Bonding Social Capital and Formal Facebook Use (r=.23, p< .01), the two are not far apart. This is interesting because it is possible that the social capital exchanges taking place among pre-service teachers within formal Facebook use environments may be oscillating between bridging and bonding social capital. As discussed earlier in this study, the concepts of bridging and bonding social capital are not intended to provide ""either-or" categories into which social networks can be neatly divided, but "more or less" dimensions along which we can compare different forms of social capital" (R. D. Putnam, 2000, p. 22). Since sharing personal profiles, content streams and, in the case of formal use, possibly course work, is inherent in social network site use, it is plausible that pre-service teachers become closer over time and are potentially converting course-centric bridging networks into bonding networks. However, these bonding networks may be characteristically different than those described and defined by Putnam and others. The bonding networks of pre-service teachers may be driven by continuously evolving combination of mechanical (e.g., studying for a test or asking questions about assignments) and emotional (e.g., emotional support

among interns) needs. In other words, acquisition of bonding social capital among pre-service teachers may be more nuanced than, for example, having the ability to get someone to lend $100, an item in the current bonding scale. The nuanced characteristics of bridging and bonding social capital among pre-service teachers suggested here will be further elaborated on and discussed in the qualitative data section that follows.

Pre-service teachers' reported experiences using Facebook. Following is a discussion of pre-service teachers' self-reported uses of Facebook as captured in four open-ended survey questions (see Measures section and Appendix C). The first two survey questions asked pre-service teaches to report Facebook uses in addition to those listed in the formal/informal use scales. The remaining two questions asked for comments on Facebook for professional and job search related uses as well as any other uses participants deemed relevant. The purpose of including these four open-ended questions was to capture those experiences not measured in the quantitative survey questions.

Formal uses of Facebook reported by pre-service teachers reflected common face-to-face instructional practices (e.g., sharing work, ideas and feedback). Reported *informal* uses focused on sharing educational, non-course related information and peer support. Both the formal and informal uses reported by pre-service teachers aligned closely with reported uses by college students in past studies (Boriack et al., 2012; Bosch, 2009; Duncan-Howell, 2012; Gray et al., 2010; Lampe et al., 2011; Steinbrecher & Hart, 2012).

Themes which emerged regarding Facebook use beyond those reported in the formal/informal open-ended questions included attitudes reflecting concern about separating personal/professional online social presence and a fear of seeming unprofessional by using Facebook, which align with the findings of Velasquez et al. (2009) in a study on technology

integration in a pre-service teacher education course. Themes also included viewing Facebook as a good way to keep in touch with former cohort members/instructors and follow professional organizations for career development and job related information, uses which align with benefits described by Weimann (1983), Granovetter (1983) and Putnam (2000).

Implications

One of the aims of this study was to replicate a previous study examining the impact of Facebook use on social capital among pre-service teachers. Instruments from previous research showing a relationship between social capital and Facebook use were used in the current study. Unlike previous research, the resulting data in the current study suggest weak connections between social capital and Facebook use among pre-service teachers.

Another aim was to extend previous work by examining students' reports of pedagogical uses of Facebook within their teacher education program. Data in the current study indicate Facebook may be facilitating the exchange of social capital among pre-service teachers. For example, pre-service teachers had overall positive attitudes toward formal and informal uses of Facebook. Coupled with emergent themes such as sharing and community building, these findings might provide guidance to teacher educators deciding if or how they should integrate online social networking into the curriculum.

Further, the specific types of formal Facebook uses described by pre-service teachers (e.g., sharing work and ideas) and informal uses (e.g., building community, support networks and sharing questions and answers) may help instructors decide the most appropriate ways in which to formally integrate social networking or encourage informal use. For example, geographic boundaries tend to be more substantial for interns than for juniors or seniors in communicating with fellow classmates (i.e., interns may not see one another face-to-face as often). An intern

supervisor integrating a Facebook group for the purpose of facilitating support among interns may fulfill a need not present among juniors or seniors.

Learning the intricacies involved in becoming a professional teacher in the information age is a challenging task. Add to that the pressures of trying to find employment post-program and adjusting to running a classroom within a profession that tends to be solitary in nature, it is no wonder why many new teachers feel stress, anxiety or even leave the profession.

Building personal learning networks is a commonly encouraged activity in teacher education programs for good reason: pre-service teachers need support. Learning to teach is a difficult and taxing endeavor. It is hoped that this research will provide some guidance to teacher educators on how social networking can have both positive and negative effects on pre-service teachers and how new technologies might be integrated into the curriculum to support the building of social capital.

Limitations and Future Research

The findings in this study are subject to at least four major limitations. First, these results cannot be generalized to the broader population of college students because the sample consists of pre-service teachers.

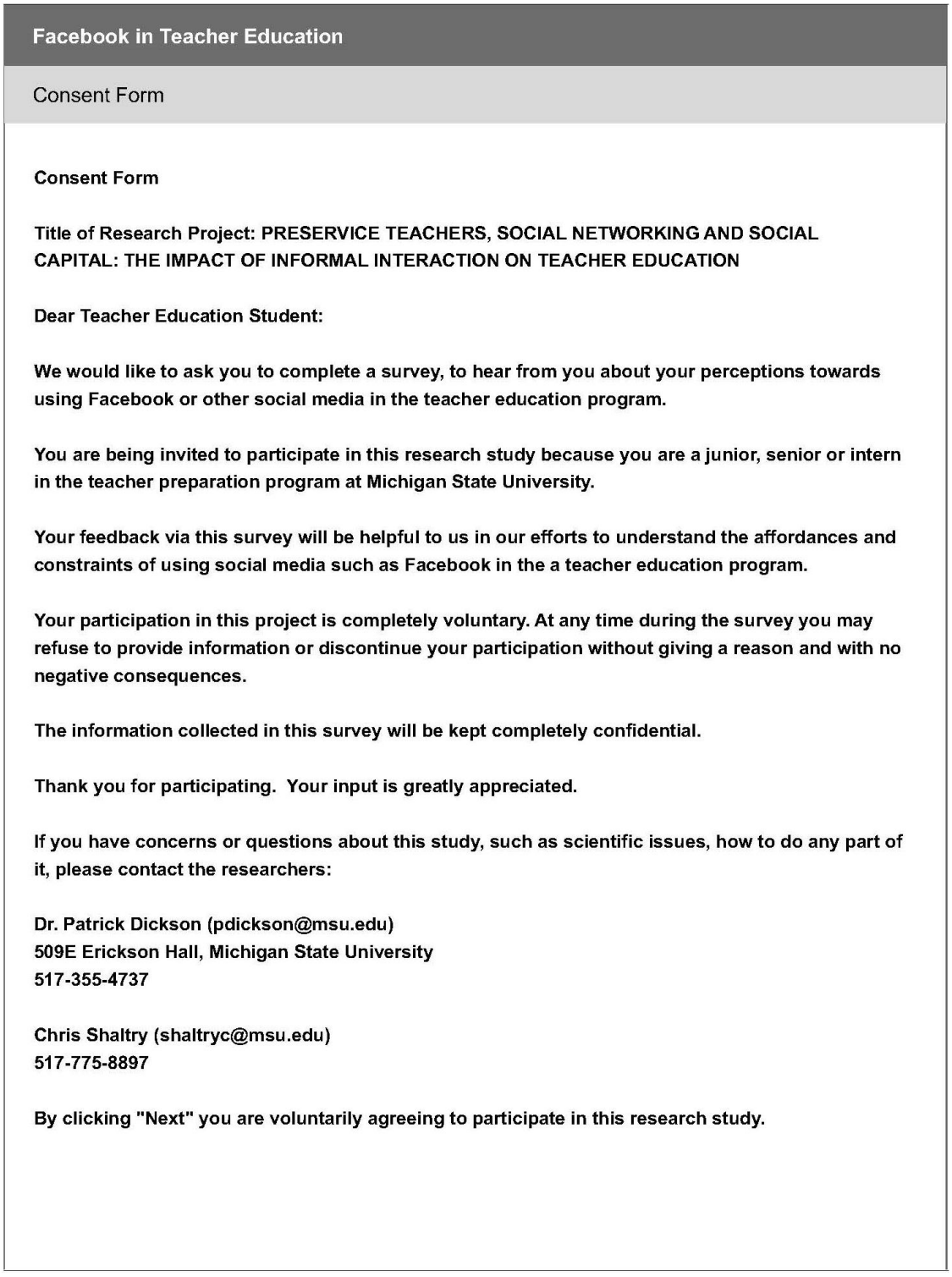
Second, the interns measured in the current study were just beginning their internship year at the time data was collected. If measured closer to the end of the school year, behaviors such as those observed in the Boriack et al. (2012) study, in which interns were observed creating informal support groups on Facebook, may influence some of the attitudes or activities reported by interns. Future research might examine Facebook use by interns toward the end of the internship year to get a better sense of the ways in which Facebook is used as they near the end of their internship year.

Third, the extensive use of cohorts in this pre-service teacher education program may have skewed some of the results, meaning that these pre-service teachers may be more likely to develop social capital offline than online. For example, the quantitative data suggest weak relationships between pre-service teachers' Facebook intensity and their levels of social capital, though data indicate that social capital is being exchanged via Facebook and attitudes toward Facebook use are high. Face-to-face interaction may be a stronger predictor of social capital development for pre-service teachers. Future researchers may want to devise ways in which to measure social capital offline as well and compare to the online measures.

Fourth, though it is interesting that the qualitative data appear to indicate additional uses of Facebook not included within the formal/informal use framework, it cannot communicate the number of pre-service teachers who might be using Facebook for the purposes listed. For example, 20 pre-service teachers reporting a particular use out of a total sample of 391 is not a representative group. The formal and informal Facebook use scales were derived from open-ended qualitative data culled for categories and themes and then quantified into an instrument intended to measure amounts and attitudes toward specific types of Facebook use. Future research could quantify the categories and themes discovered in the qualitative section of the current research in a similar manner in an effort to determine quantitatively the frequency of and attitudes toward these uses.

APPENDICES

APPENDIX A: Survey Instrument



Facebook in Teacher Education

Consent Form

Consent Form

Title of Research Project: PRESERVICE TEACHERS, SOCIAL NETWORKING AND SOCIAL CAPITAL: THE IMPACT OF INFORMAL INTERACTION ON TEACHER EDUCATION

Dear Teacher Education Student:

We would like to ask you to complete a survey, to hear from you about your perceptions towards using Facebook or other social media in the teacher education program.

You are being invited to participate in this research study because you are a junior, senior or intern in the teacher preparation program at Michigan State University.

Your feedback via this survey will be helpful to us in our efforts to understand the affordances and constraints of using social media such as Facebook in the a teacher education program.

Your participation in this project is completely voluntary. At any time during the survey you may refuse to provide information or discontinue your participation without giving a reason and with no negative consequences.

The information collected in this survey will be kept completely confidential.

Thank you for participating. Your input is greatly appreciated.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, please contact the researchers:

Dr. Patrick Dickson (pdickson@msu.edu)
509E Erickson Hall, Michigan State University
517-355-4737

Chris Shaltry (shaltryc@msu.edu)
517-775-8897

By clicking "Next" you are voluntarily agreeing to participate in this research study.

Figure 7. Survey Instrument.

Figure 7 (cont'd).

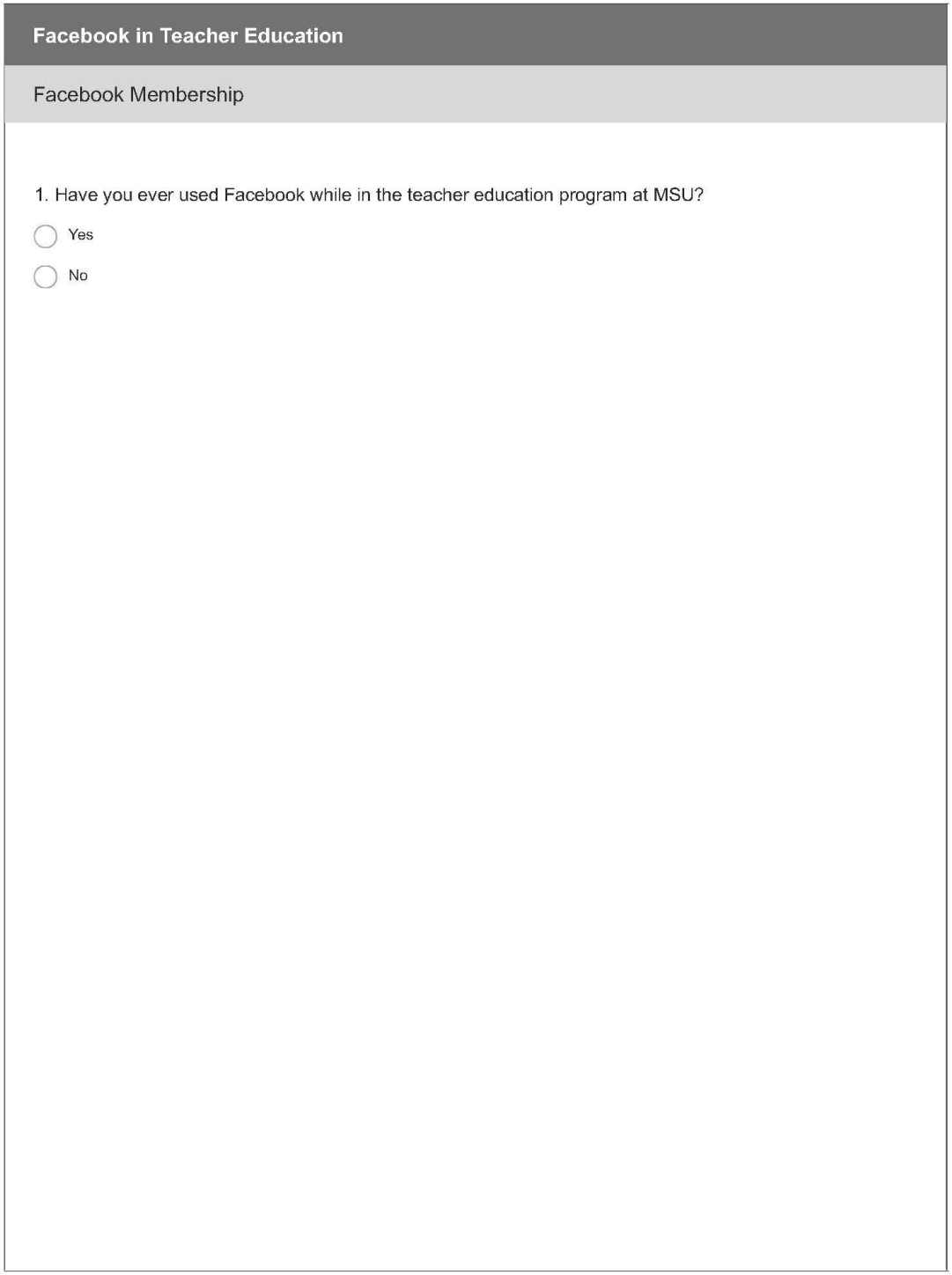


Figure 7 (cont'd).

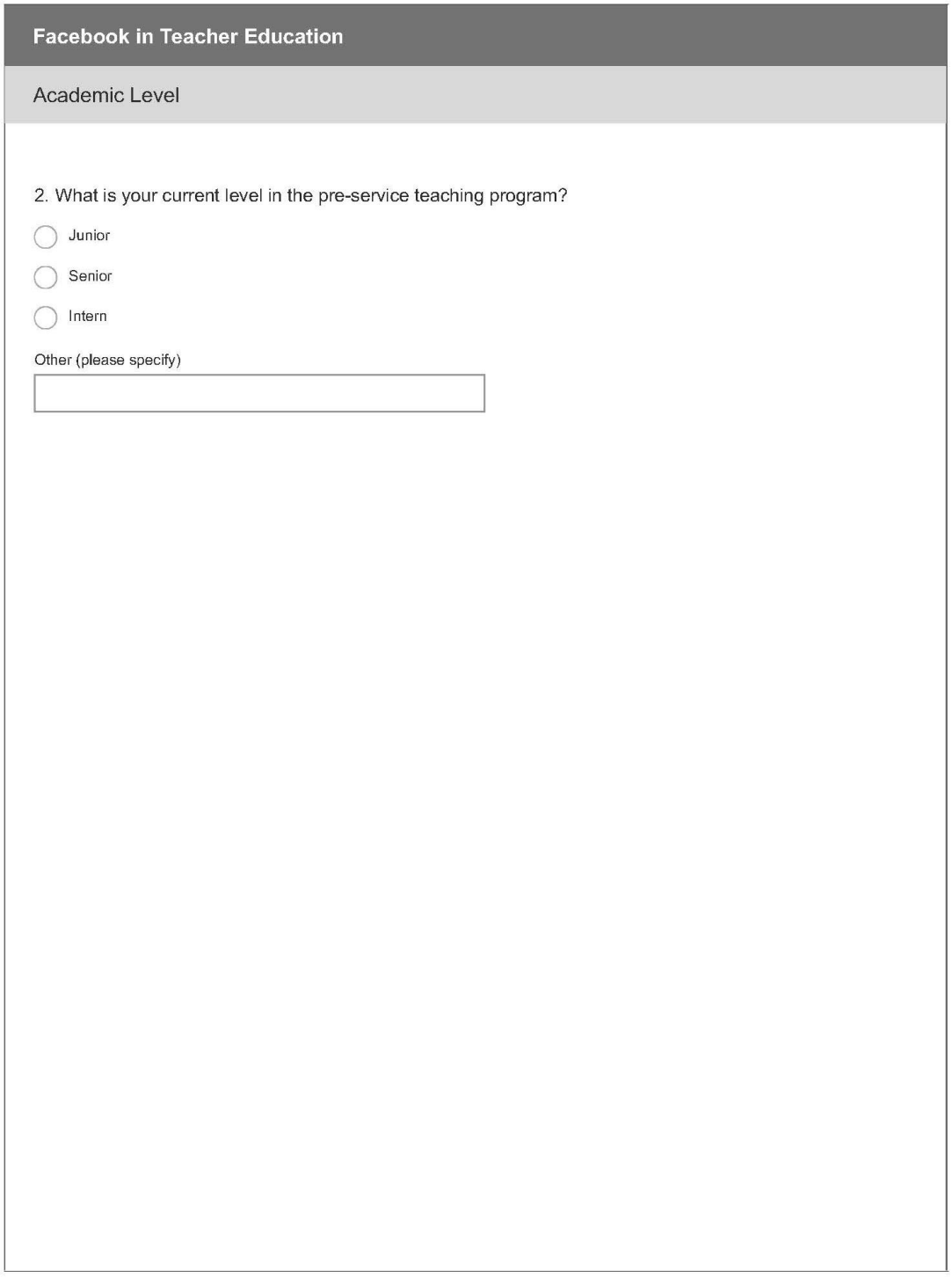
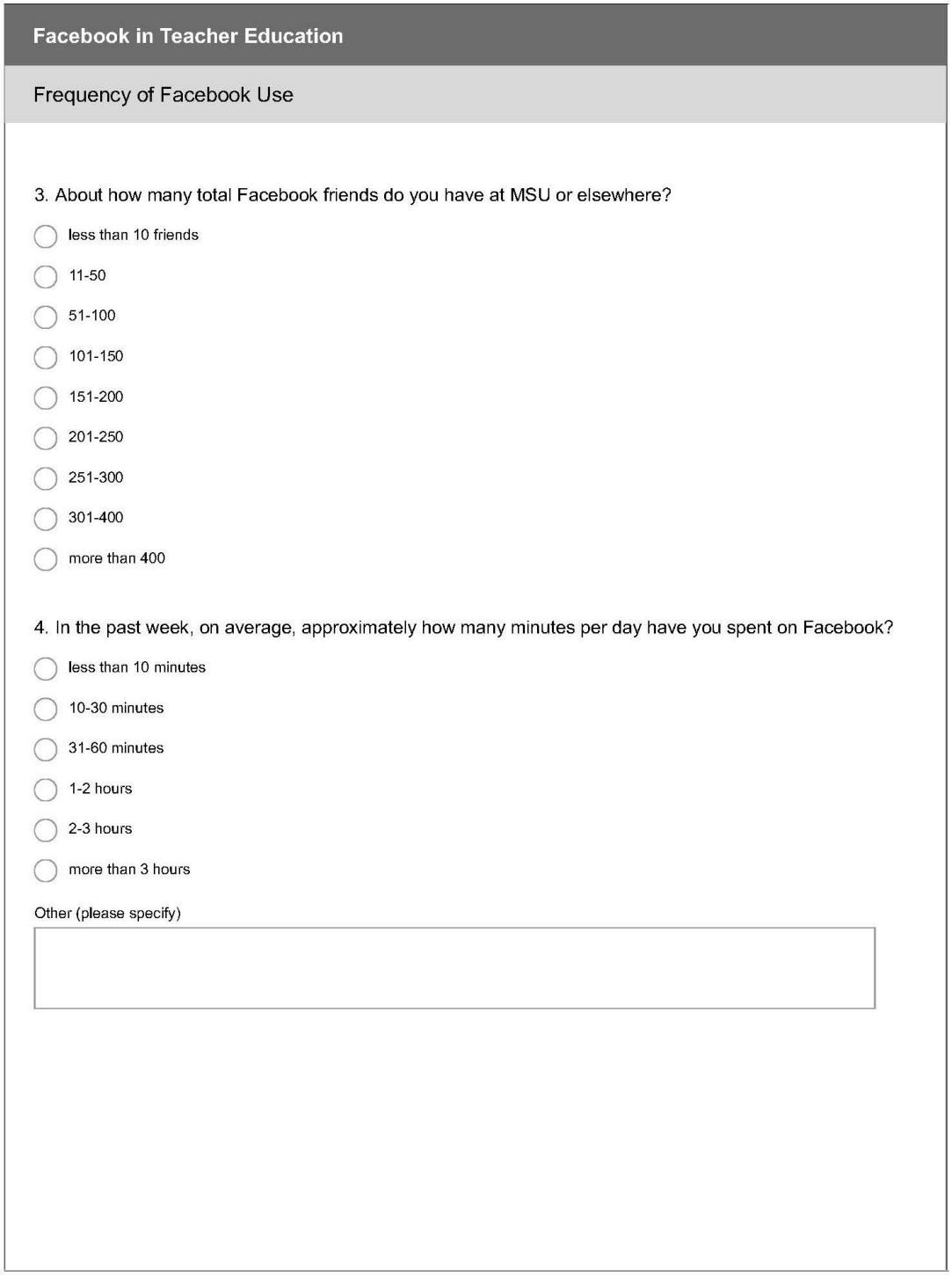


Figure 7 (cont'd).



Facebook in Teacher Education

Frequency of Facebook Use

3. About how many total Facebook friends do you have at MSU or elsewhere?

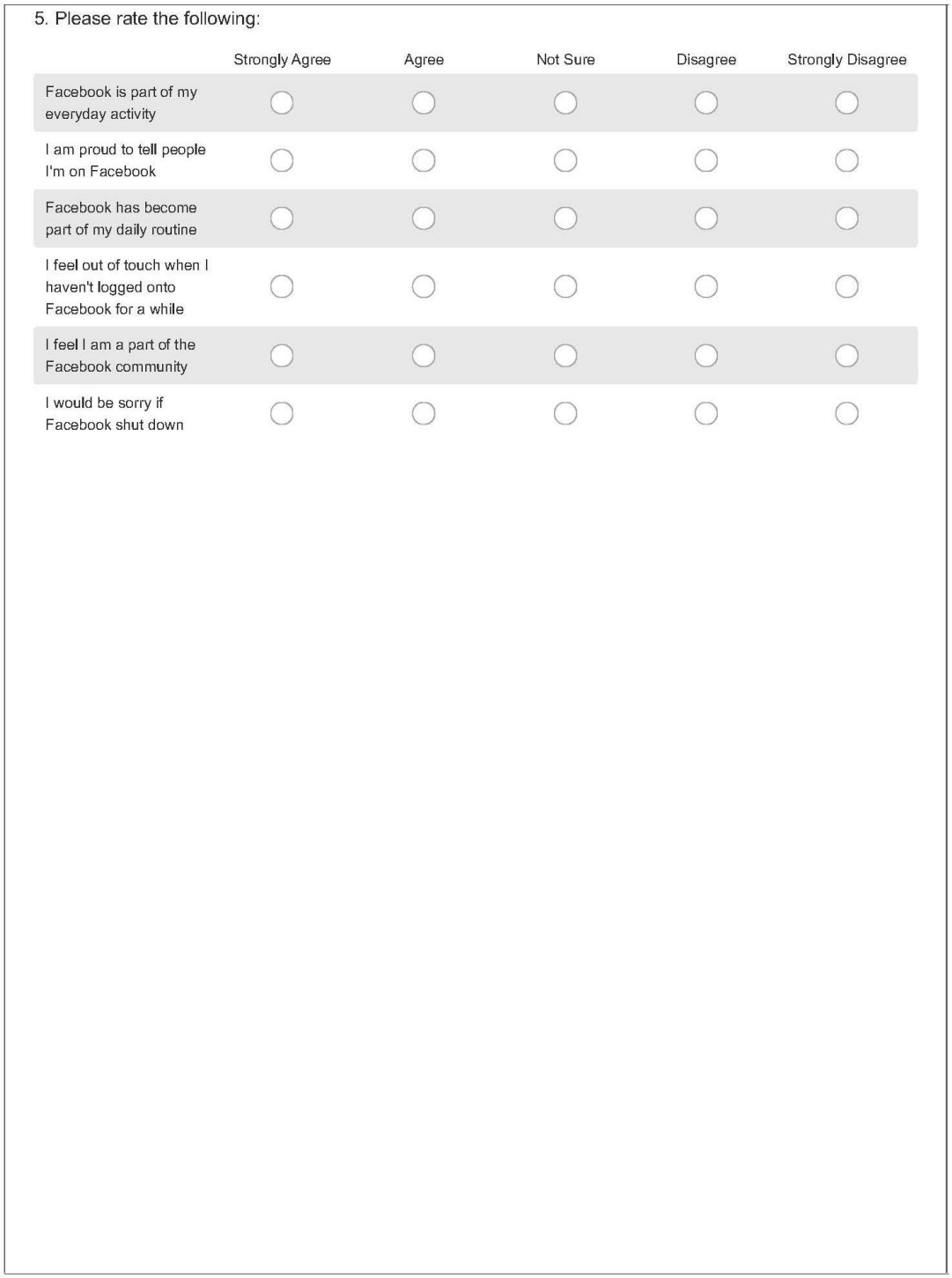
- ◯ less than 10 friends
- ◯ 11-50
- ◯ 51-100
- ◯ 101-150
- ◯ 151-200
- ◯ 201-250
- ◯ 251-300
- ◯ 301-400
- ◯ more than 400

4. In the past week, on average, approximately how many minutes per day have you spent on Facebook?

- ◯ less than 10 minutes
- ◯ 10-30 minutes
- ◯ 31-60 minutes
- ◯ 1-2 hours
- ◯ 2-3 hours
- ◯ more than 3 hours

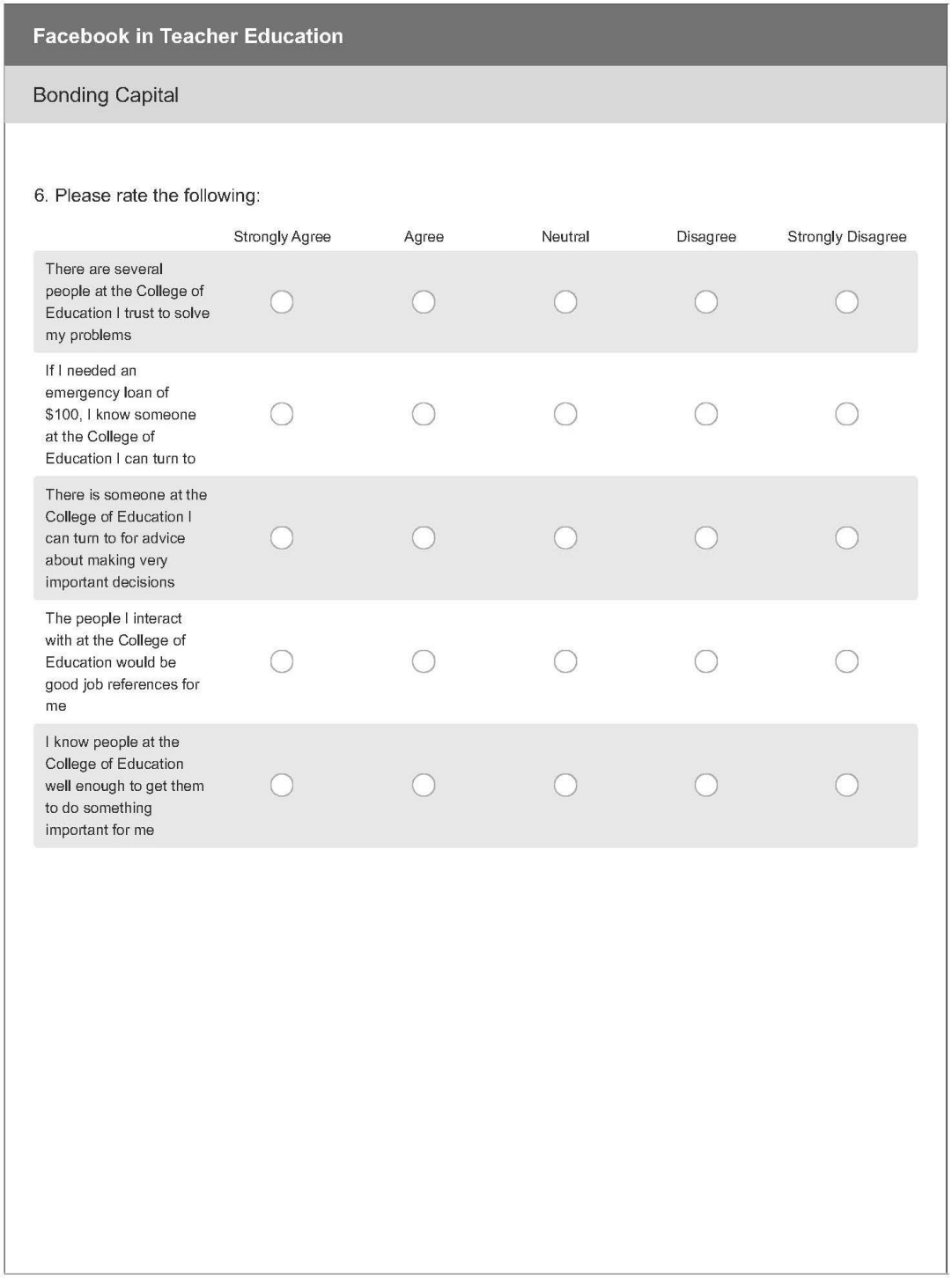
Other (please specify)

Figure 7 (cont'd).


5. Please rate the following:

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
Facebook is part of my everyday activity	○	○	○	○	○
I am proud to tell people I'm on Facebook	○	○	○	○	○
Facebook has become part of my daily routine	○	○	○	○	○
I feel out of touch when I haven't logged onto Facebook for a while	○	○	○	○	○
I feel I am a part of the Facebook community	○	○	○	○	○
I would be sorry if Facebook shut down	○	○	○	○	○

Figure 7 (cont'd).



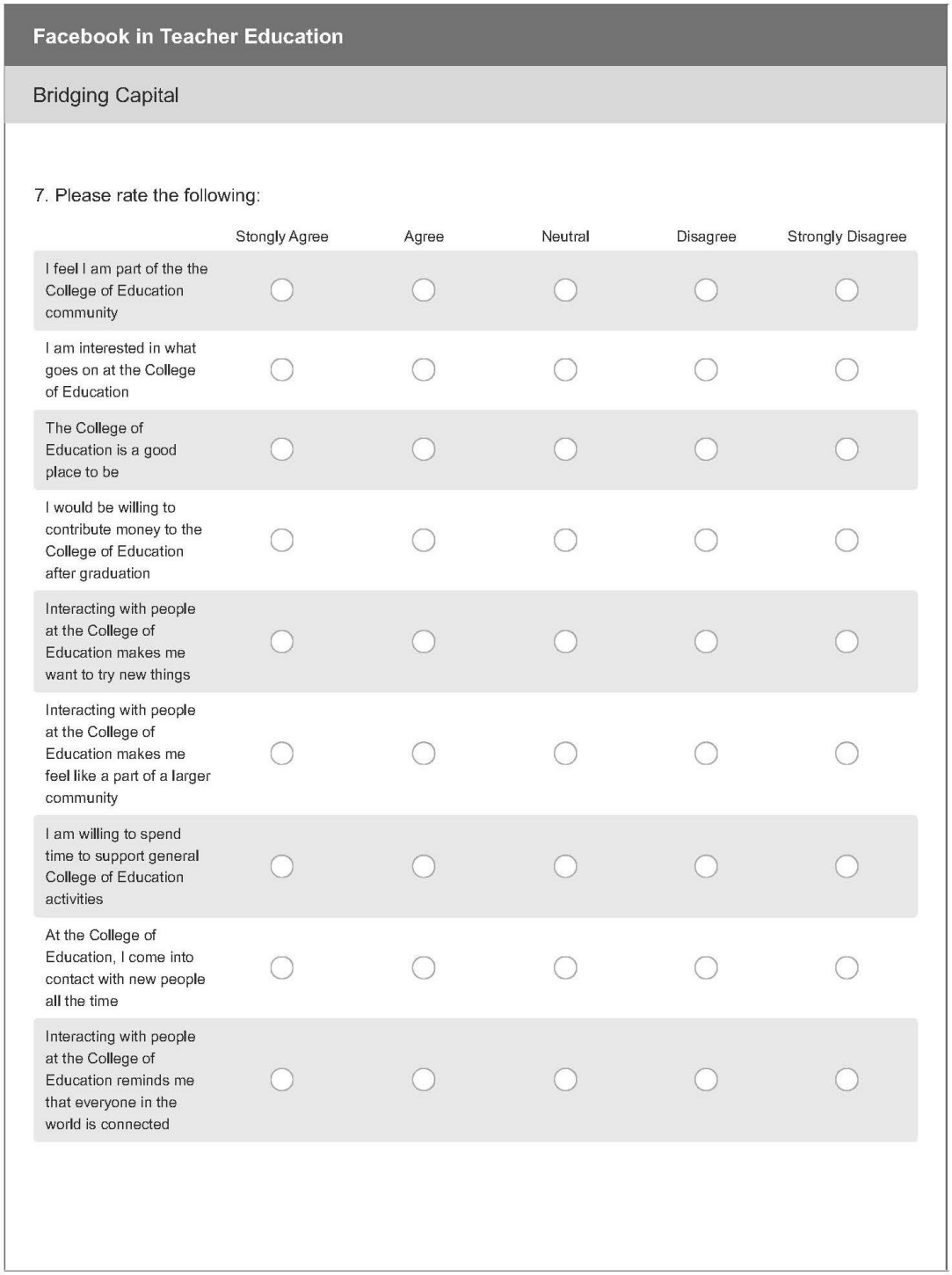
Facebook in Teacher Education

Bonding Capital

6. Please rate the following:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
There are several people at the College of Education I trust to solve my problems	○	○	○	○	○
If I needed an emergency loan of $100, I know someone at the College of Education I can turn to	○	○	○	○	○
There is someone at the College of Education I can turn to for advice about making very important decisions	○	○	○	○	○
The people I interact with at the College of Education would be good job references for me	○	○	○	○	○
I know people at the College of Education well enough to get them to do something important for me	○	○	○	○	○

Figure 7 (cont'd).



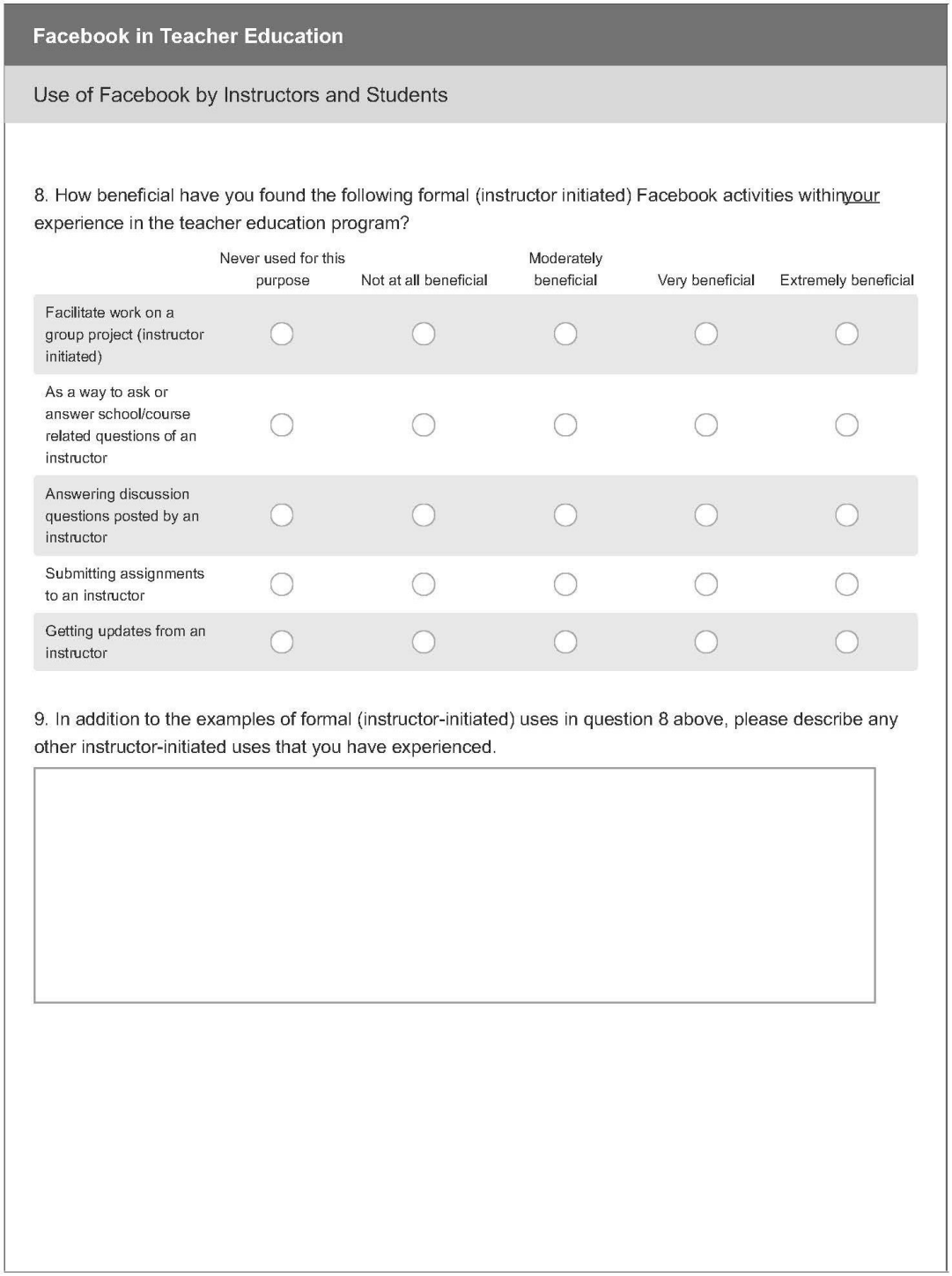
Facebook in Teacher Education

Bridging Capital

7. Please rate the following:

	Stongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I feel I am part of the the College of Education community	○	○	○	○	○
I am interested in what goes on at the College of Education	○	○	○	○	○
The College of Education is a good place to be	○	○	○	○	○
I would be willing to contribute money to the College of Education after graduation	○	○	○	○	○
Interacting with people at the College of Education makes me want to try new things	○	○	○	○	○
Interacting with people at the College of Education makes me feel like a part of a larger community	○	○	○	○	○
I am willing to spend time to support general College of Education activities	○	○	○	○	○
At the College of Education, I come into contact with new people all the time	○	○	○	○	○
Interacting with people at the College of Education reminds me that everyone in the world is connected	○	○	○	○	○

Figure 7 (cont'd).



Facebook in Teacher Education

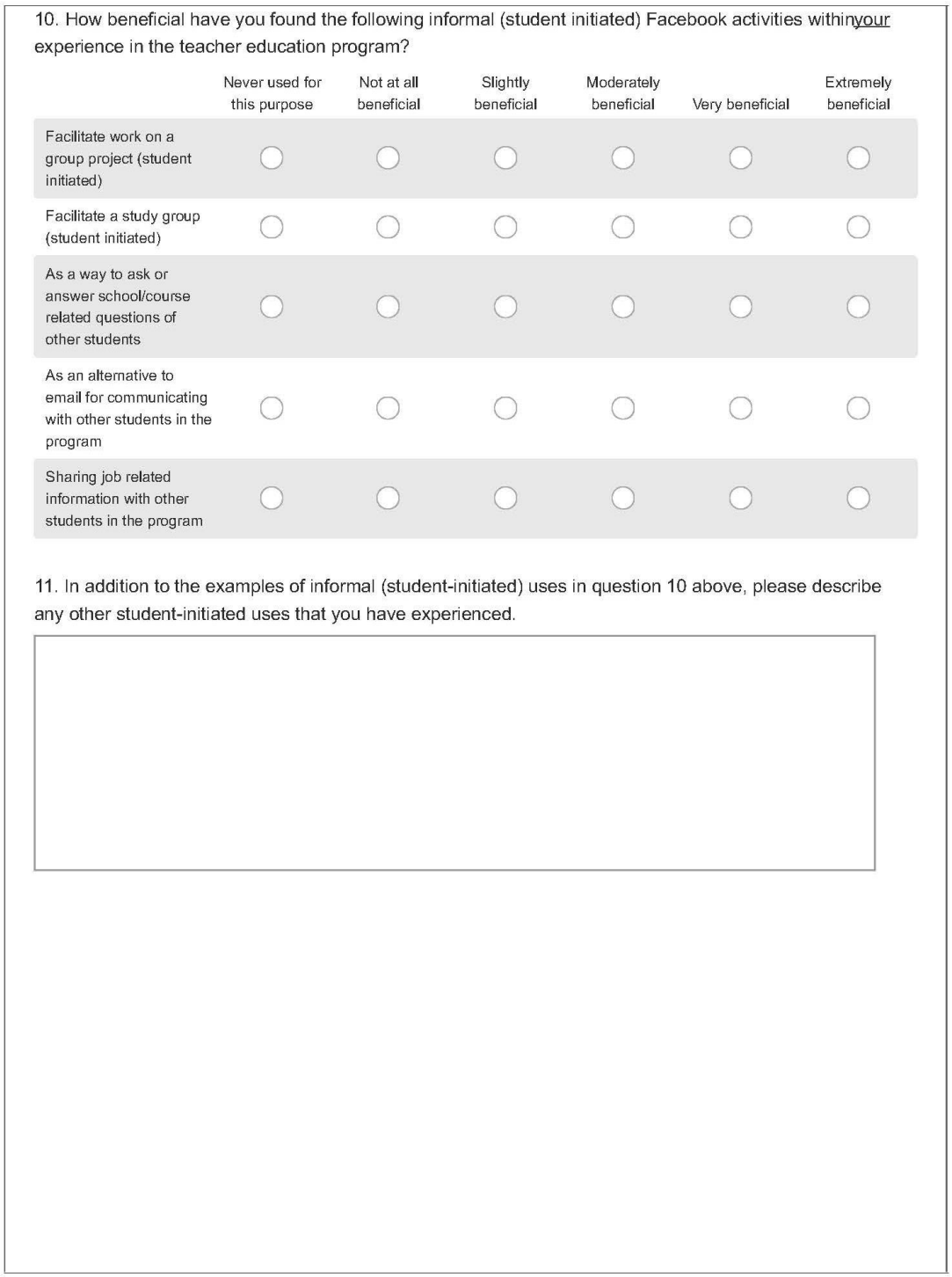
Use of Facebook by Instructors and Students

8. How beneficial have you found the following formal (instructor initiated) Facebook activities within your experience in the teacher education program?

	Never used for this purpose	Not at all beneficial	Moderately beneficial	Very beneficial	Extremely beneficial
Facilitate work on a group project (instructor initiated)	○	○	○	○	○
As a way to ask or answer school/course related questions of an instructor	○	○	○	○	○
Answering discussion questions posted by an instructor	○	○	○	○	○
Submitting assignments to an instructor	○	○	○	○	○
Getting updates from an instructor	○	○	○	○	○

9. In addition to the examples of formal (instructor-initiated) uses in question 8 above, please describe any other instructor-initiated uses that you have experienced.

Figure 7 (cont'd).

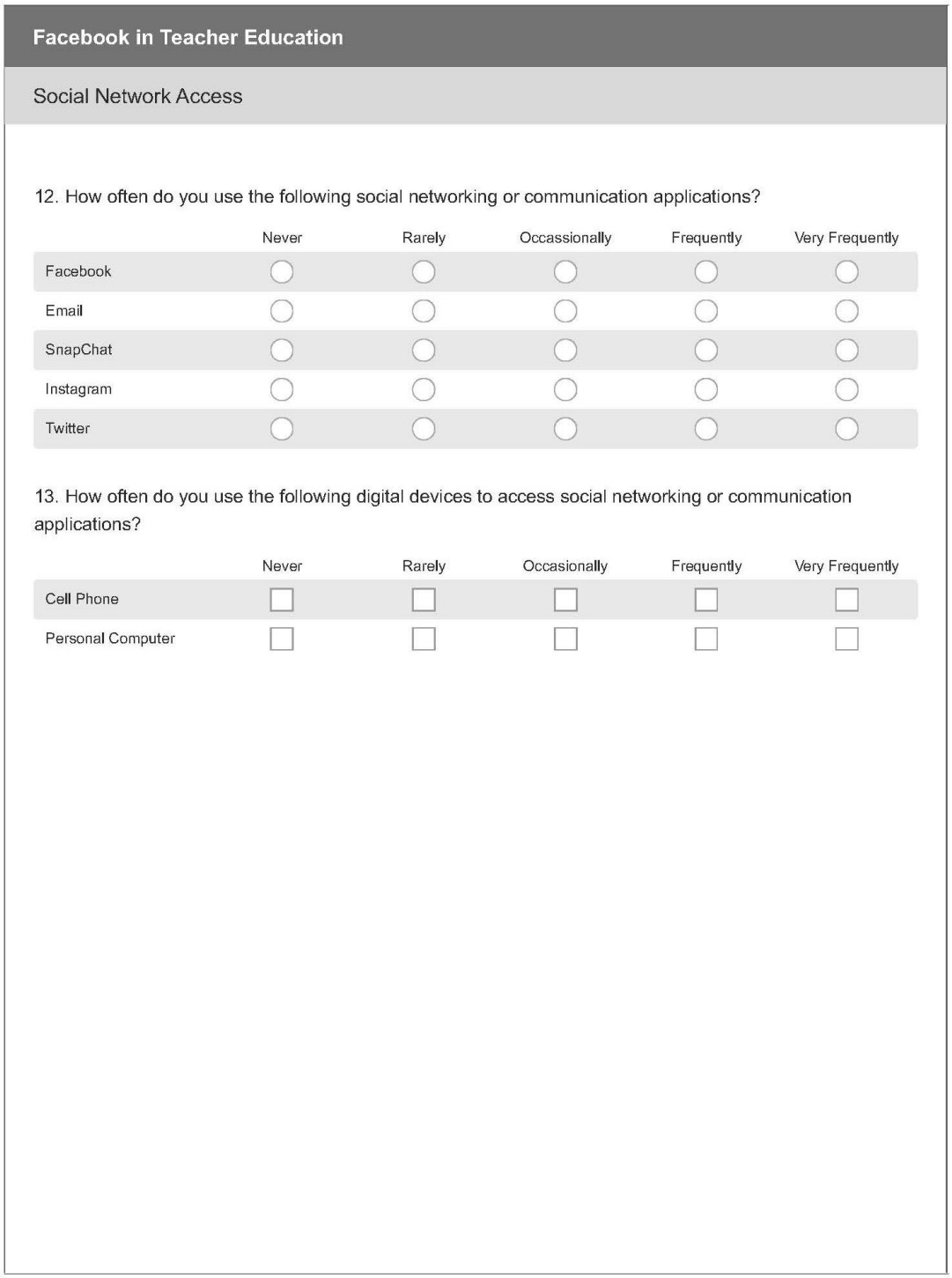


10. How beneficial have you found the following informal (student initiated) Facebook activities within your experience in the teacher education program?

	Never used for this purpose	Not at all beneficial	Slightly beneficial	Moderately beneficial	Very beneficial	Extremely beneficial
Facilitate work on a group project (student initiated)	○	○	○	○	○	○
Facilitate a study group (student initiated)	○	○	○	○	○	○
As a way to ask or answer school/course related questions of other students	○	○	○	○	○	○
As an alternative to email for communicating with other students in the program	○	○	○	○	○	○
Sharing job related information with other students in the program	○	○	○	○	○	○

11. In addition to the examples of informal (student-initiated) uses in question 10 above, please describe any other student-initiated uses that you have experienced.

Figure 7 (cont'd).



Facebook in Teacher Education

Social Network Access

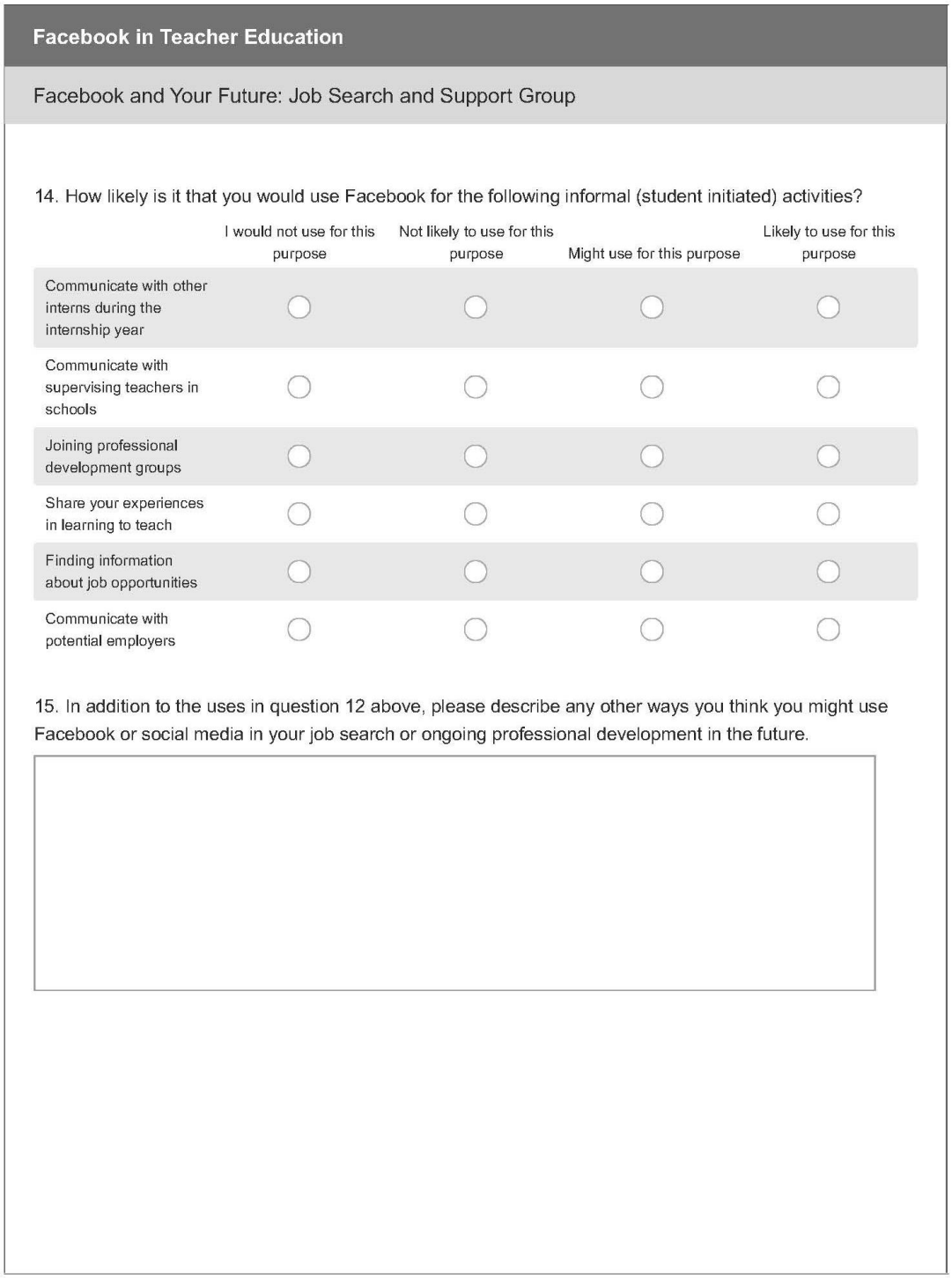
12. How often do you use the following social networking or communication applications?

	Never	Rarely	Occassionally	Frequently	Very Frequently
Facebook	○	○	○	○	○
Email	○	○	○	○	○
SnapChat	○	○	○	○	○
Instagram	○	○	○	○	○
Twitter	○	○	○	○	○

13. How often do you use the following digital devices to access social networking or communication applications?

	Never	Rarely	Occasionally	Frequently	Very Frequently
Cell Phone	☐	☐	☐	☐	☐
Personal Computer	☐	☐	☐	☐	☐

Figure 7 (cont'd).



Facebook in Teacher Education

Facebook and Your Future: Job Search and Support Group

14. How likely is it that you would use Facebook for the following informal (student initiated) activities?

	I would not use for this purpose	Not likely to use for this purpose	Might use for this purpose	Likely to use for this purpose
Communicate with other interns during the internship year	○	○	○	○
Communicate with supervising teachers in schools	○	○	○	○
Joining professional development groups	○	○	○	○
Share your experiences in learning to teach	○	○	○	○
Finding information about job opportunities	○	○	○	○
Communicate with potential employers	○	○	○	○

15. In addition to the uses in question 12 above, please describe any other ways you think you might use Facebook or social media in your job search or ongoing professional development in the future.

Figure 7 (cont'd).

APPENDIX B: Facebook Intensity Reliability Table

Table 22. Facebook Intensity Reliability Table.

Reliaibility of Facebook Intensity Scale if Items Deleted

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
About how many total Facebook friends do you have at MSU or elsewhere?	.029	27.342	.258	.868
In the past week, on average, approximately how many minutes per day have you spent on Facebook?	.022	24.624	.551	.834
Facebook is part of my everyday activity	.020	22.935	.739	.810
I am proud to tell people I'm on Facebook	.018	24.525	.555	.833
Facebook has become part of my daily routine	.019	23.164	.715	.813
I feel out of touch when I haven't logged onto Facebook for a while	.010	23.527	.674	.819
I feel I am a part of the Facebook community	.019	23.786	.642	.823
I would be sorry if Facebook shut down	.020	24.462	.568	.832

APPENDIX C: Open-ended Pre-Service Teacher Survey Responses

The following survey responses are intended to add additional texture to the discussion of formal and informal uses of Facebook by pre-service teachers. The full coding scheme is included to elucidate the coding process. In each coding scheme, codes in italics (1-5) reflect questions from the Facebook use survey instrument and were therefore not included.

Informal Facebook use

Informal Facebook use coding scheme:

0=Didn't answer question

1=Facilitate work on group project

2=Facilitate a study group

3=Ask/answer course questions

4=Alternative to email for communicating

5=Sharing job related info.

6=Sharing non-course information

7=Peer support

9=Other

10=Non-use

Informal Facebook use quotes:

- "There are future teacher organizations on Facebook that I wouldn't even know existed if I hadn't been invited to the Facebook page." (6)
- Planning activities for placement school extracurricular activities, e.g. making an event for fellow students to go see a band or orchestra concert, football game, etc" (6)

- "It is just a nice informal way to chat about what is happening in the education field." (6)
- "I have had students initiate a Facebook group for my Global Cohort within the College of Education to communicate about events and things like that." (6)
- "Bonding and gaining trust in other students" (7)
- "Sharing of experiences during the internship and tips on how to handle certain situations." (7)
- "My cohort uses Facebook to bounce teaching ideas off of one another and to get emotional/mental support." (7)
- "My English Chort [sic] currently has a facebook group. We support one another, we talk about our highs, lows, and questions we have about our internships in the schools. We love it and we use it every day." (7)

Formal Facebook use

Formal Facebook use coding scheme:

0=Didn't answer question

1=Facilitate work on group project

2=Ask/answer course questions

3=Discussion questions (assigned)

4=Submit assignments

5=Get updates from instructor

6=Peer review

7=Sharing extension ideas/content

8=Sharing work with others

9=Other

10=Non-use

Formal Facebook use quotes:

- "My geography classes use it as a way for the online sections to connect and post news about geographic related subjects. To be honest, none of the students, including myself, care about the news. We care about what is happening in the class and they barely posted anything when it came to the class. I'm sure some students interested in geography liked it, but for me, it was a waste of my time." (7)
- "Former instructors have been available on Facebook for a certain amount of time before an exam or a project deadline. Additionally, former instructors have given supplementary articles or cool news stories in relation to the course material." (7)
- "Used a classroom Facebook page to ask any questions we may have and to post pictures and ideas of what is going on within class." (8)
- "We have just had updates for experiments we have done in class on the page so everyone can view all of the fun results and ask questions." (8)
- "Class pages to share projects." (8)

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