

Social Media as Connected Learning Technology: A Mixed Methods Investigation of
Facebook for Undergraduate Education

Samantha Gwai Lan Won

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John K. Burton, chair
Michael A. Evans, co-chair
Liesl Baum-Walker
Erika Grafsky

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ABSTRACT

Social media technologies are networked technological tools that can provide opportunities for productive socialization and collaboration. While social media are being incorporated increasingly into formal classroom settings, there is very little research available providing specific evidence for the affordances and limitations of social media as educational tools. It is also unclear whether undergraduates are open to, or already using social media for educational purposes. The current study explores *Facebook* as a collaborative and participatory learning tool to provide information on sex-related topics to undergraduate students. Connected learning was used as the guiding framework for exploring the ways that social media blend peer culture, academics, and learner interests to promote learning through interactions with a learning community. Results of the study indicate that undergraduate students were open and willing to using social media in academic contexts. However, students did not contribute comments directly to the study page resulting in a lack of evidence confirming whether connected learning occurred. Based on student responses, instructors hoping to integrate social media into their courses would do well to focus on maintaining responsiveness to students, promoting the development of a learning community, and varying the style and format of posts. It was determined that social media sites such as *Facebook* would serve best as supplemental, but intentional educational technologies rather than the basis for creating entire courses. Further research should center on understanding the participation and lurking patterns of

students in educational social media environments, as well as the driving factors behind these participation patterns.

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Table of Contents

List of Figures	vii
List of Tables	viii
Chapter I: Introduction.....	1
Connected learning and participation	4
Collaborative learning and social media.....	7
Sex education and social media	9
Purpose statement	11
Research Questions.....	11
Organization of Document.....	12
Definition of Terms	13
Chapter II: Review of the Literature.....	15
Learning Through Participation: A Theoretical Perspective	15
Connected learning and the sociocultural perspective.....	15
Communities of practice and collaborative learning	19
Engagement: Exploring personal interest within connected learning	24
Summary	26
The Role of Social Media: Education and Socialization	27
Social media usage and young adults	28
Social media usage in education.....	32
Affordances and limitations of social media as educational tools.....	36
Summary	43
Sex Education Efforts and Social Media	44
Young adult knowledge of sex-related topics.....	45
Efficacy of sex education curricula	48
Sex education efforts through social media	51
Summary	55
Chapter III: Methodology	56
Purpose Statement and Study Design	56
Research Questions.....	57
Participants and Recruitment	59
Sample	59
Role of Researcher.....	60
Instruments.....	61
Procedures.....	63
Data Analysis.....	66
Approval and Data Security.....	70
Summary.....	71
Chapter IV: Results.....	72
Research Question 1	72
Summary	91
Research Question 2	91
Summary.....	98

Research Question 3	99
Summary	106
Chapter V: Discussion	108
Social media and connected learning experience	108
Implications for the integration of social media into educational settings	114
Limitations	119
Summary and Conclusions	121
References.....	123
Appendices	
Appendix A.....	136
Appendix B.....	138
Appendix C.....	140
Appendix D.....	144
Appendix E.....	148

List of Figures

Figures:

<i>Figure 1.</i> Reasons for accessing social media	74
<i>Figure 2.</i> Student support for academic social media use	76
<i>Figure 3.</i> Recommendations for integration of <i>Facebook</i> into academia	80
<i>Figure 4.</i> Challenges of social media use for academia	86
<i>Figure 5.</i> Establishment of community through social media.....	93
<i>Figure 6.</i> . <i>Facebook</i> posts per day, and views over time.	100
<i>Figure 7.</i> Factors driving participation through <i>Facebook</i>	101
<i>Figure 8.</i> Participation in social media sites.....	104

List of Tables

Tables:

Table 1: <i>Final timeline of events for study</i>	65
Table 2: <i>Descriptive and prescriptive assertions for discussion</i>	108

Chapter I: Introduction

Headlines in popular media proclaim that social media are changing the ways in which young adults and teenagers are interacting with one another, influencing the ways that peer relationships may form (Pascoe, 2011). Perhaps as a result, interest in social media as educational tools has also come to the forefront of research in instructional design and the learning sciences as a way of engaging students through the use of familiar technologies (Junco, 2011; Tess, 2013). Due to the increasing popularity of social media among undergraduate populations, undergraduate students present a convenient sample for investigating the ways that social media may be appropriated for educational purposes. While social media are becoming a trending topic of interest in educational research, there is scant evidence to determine the affordances and limitations of social media usage in the classroom environment (Merchant, 2012). The current study aims to contribute to this area of research, exploring the potential of social media as educational tools for undergraduate populations.

Today, web-based digital technology usage is integrated seamlessly into American culture. Americans of all ages are interacting in new ways with new technologies, as evidenced by current reports. The Pew Internet Research Center reports that 95% of teenagers aged 12-17, 95% of young adults aged 18-29, 89% of adults aged 30-49, 77% of adults aged 50-64, and 52% of older adults aged 65 and above access the internet on a regular basis (Madden, Lenhart, Duggan, Cortesi, & Gasser, 2013b). The ability to seek information at any time could extend the learning environment beyond the classroom, blurring the boundary between formal and informal learning (Arnold & Paulus, 2010).

Current statistics by Pearson Education in 2013 show interesting trends in online technology usage in higher education (Seaman & Tinti-Kane, 2013). Over half (59%) of faculty

favorably look upon online technologies, agreeing that they help to create better learning environments by providing greater opportunities for interaction. This is pertinent given that 56% of faculty also agree that online technologies have a tendency to be more of a distraction than a benefit for student academic work. The majority of faculty (79%) have also reported that communication with students has increased as a result of digital communication. Nevertheless, perhaps as a result of instantaneous communication capabilities, faculty also report that digital communication has increased their stress level (48% of faculty) and added hours to their work week (65% of faculty).

The broad statistics presented indicate that young adults and teenagers in the United States are utilizing web-based digital technologies not only in their personal lives, but also in formal classroom settings. Smartphones and laptops are increasingly common in college classrooms, but undergraduate students do not limit their use to strictly academic or strictly recreational functions dependent on the environment. For example, students may use laptops to take notes via word processing software, but they may also keep social media tabs open to coordinate after class activities with friends. Perhaps as a result of this blending of functions, the integration of social media as educational tools may provide a way for learners to bridge the boundary between their casual, personal interactions through social media and the concepts that they have learned in class (Ito et al., 2013). Social media, for the purposes of this study, are defined as a variety of networked technological tools that allow for and encourage social interaction and communication as well as productivity and creative collaboration. This aligns with the definition of Dabbagh and Kitsantas (2011) in their review of social media for self-regulated learning. In the classroom, 8% of public school teachers report the use of social networking sites “sometimes” or “often,” and 16% of public school teachers report the use of

blogs of wikis (Gray, Thomas, & Lewis, 2010). Outside of the classroom, social media provide ways that young adults and teenagers interact with not only members of their offline social networks, but also online friends and communities that share similar interests (Madden et al., 2013a; Ophus & Abbitt, 2009). Aside from recreational use for interaction with friends, social media are also being increasingly utilized within formal and informal educational settings as a strategy for enhancing the learning process and promoting collaboration (Tess, 2013). For example, current research examines the usage of social media as an integral component of the design and development of educational activities for middle school aged youth in afterschool settings (Evans, Won, & Drape, 2014). Hrastinski and Aghaee (2012) also report that social media are one of the three major types of interactions driving the undergraduate experience, with the other two being face-to-face interactions with instructors and interactions through course management systems. The potential affordances and limitations of social media technologies, while outlined in a number of literature reviews (Dabbagh & Kitsantas, 2011; Tess, 2013) and studies (Gikas & Grant, 2013; Li, Helou, & Gillet, 2012; Wolf, Wolf, Frawley, Torres, & Wolf, 2012), have yet to be confirmed through thorough investigation.

The use of social media as educational tools can be explored in many different contexts from formal college courses to less formal interest groups for specific topics. The topic of sex education provided a channel to explore connected learning in this study, as it has been identified as an area of need for the undergraduate population (Frost, Duberstein, & Finer, 2012; Polis & Zabin, 2012). It was also proposed that connected learning could serve as a particularly relevant framework since sex education may appeal to the interests of the population (Wynn, Foster, & Trussell, 2009). Sex education is also integrated into peer culture, since many young adults cite peers as important sources of information on sex-related topics (Hoff et al., 2003). Sex education

efforts conducted through social media are relatively rare, and are recognized as such by Gold et al. (2011), who state that much of social media usage for sex education goes unreported in the literature. The work that has been done focuses heavily on intervention strategy. Behavioral change is commonly measured through self-report surveys (Bull, Levine, Black, Schmiede, & Santelli, 2012), and sexual health knowledge may be assessed through qualitative analysis of submitted questions or concerns (Wynn, Foster, & Trussell, 2009). These topics tend to be the predominant areas of examination when considering sex education through social media or other internet based methods. While the promotion of healthy sexual behaviors and practices remains important in the United States, there has been little research addressing the perceptions that learners have towards learning about sex-related topics through social media. This is true despite the high prevalence of social media usage among teen and young adult populations, including the typical age range for college undergraduates (Madden et al., 2013a).

This introduction is meant to provide the reader with the need and theoretical basis for the proposed study. In the next section, the theoretical framework guiding the study will be discussed, establishing connections to the instructional design and learning sciences fields. A discussion of social media usage for collaborative learning will then be included, followed by background information related to the use of social media as educational tools for sex education. The introduction will conclude with descriptions of the problem statement, research questions, and organization for the rest of the document.

Connected learning and participation

The analytical framework for the current study draws heavily from the theory of connected learning (Ito et al., 2013). The basis behind connected learning theory is that the internet and new digital media allow learners to acquire support and guidance from others as

they engage in self-directed exploration of new topics. This process is driven by the personal interest of the individual, and leads to the establishment of learning communities that can be inclusive of members of the home, school, and peer social networks. Ito et al. (2013) recognize learning as a social process, which heavily emphasizes active participation and the establishment of connections. The formation of learning communities can provide opportunities for learners to interact with more knowledgeable others and develop expertise (Wenger, 1998). These interactions can be facilitated through the use of social media and the ability to access social media using both stationary and mobile technologies (Lai, Khaddage, & Knezek, 2013). As seen by the increasing presence of young adults and teenagers on the internet (Madden et al., 2013b), the opportunity to engage in self-directed inquiry and to connect with more knowledgeable others is widely available. Connected learning theory, while only recently appearing as a way of conceptualizing learning in the digital age, can be associated with more foundational work including participatory learning (Sfard, 1998), community of practice theory (Wenger, 1998; Lave & Wenger, 1991), and sociocultural learning theory (Vygotsky, 1978).

Participatory learning is not a new idea within educational research and instructional design. In a paper by Sfard (1998), two major metaphors are identified to describe how learning takes place. The first is the acquisition metaphor where learning is described as a passive internalization of knowledge. The second is the more relevant participation metaphor in which students learn through joining and interacting with learning communities (Sfard, 1998). The participation metaphor is therefore consistent with the connected learning theory of Ito et al. (2013), which describes the importance of interaction and connection with others. In discussing the ways that instructors and learners may interact through the internet and social media, there is inevitably discussion of learning as a social and active process.

The social aspect of learning is further emphasized when discussing the specific idea of learning communities as described by Wenger (1998), and Lave and Wenger (1991). Wenger's community of practice theory is particularly relevant in discussing learning through the internet and digital media. According to Wenger (1998), communities of practice consist of a central core of individuals responsible for passing on information and organizing the community, a variety of individuals who are involved and invested in the community in different ways and different amounts, and periphery members who are new to or marginally involved with the community. Communities of practice each have their own methods of operation, boundaries, and traditions that are passed on from more knowledgeable participants to novice participants. While the internet does not physically bring people together, it provides the opportunity to share ideas and form communities across distances and independent of time.

The formation of learning communities has important implications for examining education through social media, and is consistent with the sociocultural theory of Vygotsky in which learning is an inherently social process (Vygotsky, 1978). Oh, Lauckner, Boehmer, Fewins-Bliss, and Li (2013) conducted an analysis of the effects of social support for health through the social networking site, *Facebook*. They found that emotional support for people seeking health information was a strong predictor of self-efficacy. The emotional support of others through *Facebook* is related to connected learning theory in which supportive others assist in their learning. With one third of teenagers and 72% of young adults in the 18-29 year age range seeking health related information through the internet (Kelly, 2010), it is important to examine the social aspect of sex education and the ways that individuals may participate in learning communities centered around sex-related topics. In using connected learning as an educational framework, the interactions that community members have with one another become

important as a way to provide support and to pass on information from more knowledgeable others to less knowledgeable members.

Due to the emphasis of connected learning theory on social interactions, social media serve as a relevant area of interest. It was previously mentioned that social media are heavily integrated into the peer culture of young adults and teenagers, who use them as a way to connect with friends and maintain their personal lives (Ophus & Abbitt, 2009). In addition to this, social media are being more commonly integrated into classrooms as a way for instructors to maintain contact with students. Connected learning emphasizes the potential for learning at the boundary between academics, peer culture, and student interest. Thus, with the use of social media occurring in personal and academic settings, social media have been proposed as technologies that may bridge the gap between formal and informal learning (Dabbagh & Kitsantas, 2011).

Collaborative learning and social media

The increasing utilization of online learning environments provides a multitude of ways for students to access and interact with course material as well as instructors and peers involved with that course (Dabbagh & Kitsantas, 2011). In an article discussing the implications of digital connectivity for educational practice, McLoughlin and Lee (2010) state that instructors are faced with students that are constantly multitasking and socializing, expecting immediate and consistent access to the internet. Instruction making use of the internet and online technologies should therefore adopt a more student-centered focus, with students given the opportunity to explore external resources and ideas. Based on the connected learning theory of Ito et al. (2013), learners can shift between casually perusing information associated with areas of interest, and becoming actively involved in deeper exploration of resources and skills when they have the support of a social community. For example, peers, and caring adults within a learner's offline

and online social networks can encourage learners to make connections between what may have been presented in a formal classroom setting and the information that they explore out of personal interest.

Peer relationships have been identified as a particularly significant source of informal sex education among teenagers and young adults. Secor-Turner, Sieving, Eisenberg, and Skay (2011) performed a study to determine the effect of informal sources of sexual health information on the sexual behaviors of teenagers and young adults between the ages of 13 and 20. The study determined that peers and siblings were the most commonly reported sources of sexual health information. Specific results showed that ninth grade students reporting any informal sources had a significantly higher chance of having used contraception during the last instance of sexual intercourse. Ninth and twelfth grade students reporting any of the informal sources were also significantly less likely to be involved with having been involved with a pregnancy. These results indicate that informal sources of information on sexual health do have important effects on the sexual behaviors and practices of young adults and teenagers. Because one potential affordance of social media is the formation of learning communities providing emotional support (Oh et al., 2013), social media may provide an effective way to promote collaborative learning for sex education purposes.

Understanding whether the internet and social media may be used effectively for educational purposes has been reviewed multiple times. Tess (2013), in a literature review exploring the role of social media in higher education, recognizes the increasing presence of social media usage in universities as well as the lack of empirical research conducted to support this increase. Merchant (2012) also recognizes the lack of empirical evidence adequately exploring the affordances and limitations of social networking, and seeks to define social

networking through the context of social science. In doing this, Merchant (2012) proposes three ways to approach social media usage in educational settings. Learning *about* social networking sites refers to the exploration of how social media are utilized in the lives of learners. Learning *from* social networking sites refers to the exploration of the ways that learners can use social media in order to engage in informal learning and social interaction. This approach also encourages researchers to give thought to the ways that social media can be integrated into current pedagogy. Finally, learning *with* social networking sites refers to the idea that learners maintain profiles through social media on their own, and that making use of these existing profiles can extend learning environments and promote collaborative learning. For the purposes of this study, learning *about* the ways that undergraduates use social media should help in understanding how undergraduates learn *from* academic efforts conducted using social media. This is especially true in establishing connections to the connected learning framework, where the ways that students use social media based off of their interests and culture may contribute to the amount of blending that occurs with academic life.

Sex education and social media

Formalized sex education curricula in the United States varies from state to state and school to school, making it difficult to assess its effects on the behaviors and knowledge of students entering college. The Guttmacher Institute (2014) reports that 22 states and the District of Columbia require sex education, 20 of which also require education on HIV. Guidelines are present for sex education in 27 states, but are also state dependent with only 13 states requiring that information presented be medically accurate, 26 states requiring that information presented be age appropriate, 8 states requiring that information presented be unbiased by gender or

cultural background, and 2 states requiring that sex education may not promote a specific religion.

Further variation in American sex education systems stems from the content covered in sex education curricula. For example, 18 states and the District of Columbia require that contraception be covered, 19 states require instruction on the importance of abstinence until marriage, 12 states require discussion of sexual orientation, and 26 states require the presentation of information on healthy decision making (Guttmacher Institute, 2014). College environments bring together large numbers of young adults from a large number of locations. As a result, undergraduate populations are diverse in terms of sexual knowledge, behaviors, and practices. It is therefore beneficial to provide opportunities for undergraduate students to access information on safe sexual behaviors and practices at the college level.

The use of social media to provide information on sex-related topics to young adults is a relatively new area of research. Guse et al. (2012) conducted a review to determine the extent of current literature in exploring the efficacy of using digital media for this purpose. Out of 942 abstracts analyzed, only 10 met the criteria to be included in the review. Criteria for inclusion included that at least 50% of study participants analyzed be between 13 and 24 years of age, that studies must have empirically analyzed the impact of the sexual health intervention on sex-related knowledge, attitudes, and behaviors, and that studies must have measured outcomes in the topic areas of sex, reproduction, STIs, HIV, condoms, and methods of contraception. Of the 10 studies that were included in the literature review, the majority (eight) involved web-based interventions, one was conducted using mobile phones, and only one was conducted through a social media website. Analysis of study results indicated that networked media have potential to promote healthy sexual behaviors and practices, to influence attitudes associated with sexual

behaviors (for example, self efficacy with contraceptives), and to increase knowledge of sex-related topics. The review by Guse et al. (2012) recognized a rapidly changing and evolving field of study with a need for more empirical research, follow ups, and a focus on the measurement of behavioral outcomes. Thus, the current study attempts to provide empirical evidence for the affordances and limitations of social media as an educational tool for providing information on sex-related topics to undergraduate populations. Viewed from a framework of connected learning, sex education via social media has the potential to provide opportunities for blending undergraduate interest in sex-related topics with the presentation of educational content, aided by socialization with peers and more knowledgeable others.

Purpose Statement

The purpose of this study was to explore undergraduate experiences of learning about sex-related topics within an informal social media environment (*Facebook*). While the affordances and limitations of social media for educational purposes have been touched on and reviewed by multiple authors, there is a lack of empirical evidence supporting or opposing the efficacy of integrating social media into formal educational experiences. This study seeks to provide evidence about the ways that undergraduates perceive learning through social media, and whether this affects their experience of connected learning. Since connected learning emphasizes the blending that occurs between peer culture, academics, and learner interests, special attention will be given to instances in which these areas may blend. Sex education will provide the information content for the study, as it may serve as an area of interest for the current population in addition to being an area of need.

Research Questions

The research questions include the following:

1. Does the use of *Facebook* as an educational tool support connected learning as indirectly measured by the associated factors of:
 - a. Open and positive attitudes towards blending recreational and academic social media usage
 - b. Involvement with social media for the purpose of learning or participating in academics, and
 - c. Evidence of community interaction?
2. How can social media be used as educational tools for promoting collaborative learning experience?
3. How and why do undergraduate students access social media as part of their formal and informal college experiences?

Document Organization

Chapter 1 introduces the connections between social media as educational tools, connected learning as a theoretical framework, instructional design and the learning sciences, collaborative learning, and sex education as the context for the proposed study. The chapter concludes with the problem statement, and lists the three major research questions that will drive the study.

Chapter 2 presents a review of the current literature relevant to the topic of study. This is broken down into multiple sections. The first section delves into the theoretical basis behind the current study, elaborating on connected learning theory, collaborative learning, and learning communities. The second section addresses the topics of social media usage by young adults, the use of social media within education, and the affordances and limitations of social media for educational purposes. The third section discusses sex education efforts, the hallmarks of effective

sex education programs, the misconceptions that undergraduate populations have about sex-related topics, and sex education efforts that have utilized social media.

Chapter 3 provides an overview of the qualitative and quantitative methodological practices used to carry out the final dissertation study. The problem statement and research questions will be readdressed. Sections describing participants, the role of the researcher, instruments, procedures for data collection, data analysis, and study approval will be included.

Chapter 4 includes a report of the final results following the implementation of methodology outlined in Chapter 3. Results are reported in the order of the research questions.

Chapter 5 includes a discussion of the study results followed by implications for current practice and future research. Limitations of the study will also be outlined in this section. The document will end with a summary and final conclusions that should provide new insight into the use of social media for educational purposes, and the undergraduate connected learning experience.

Definition of Terms

- **Collaborative learning:** Collaborative learning involves the formation of new insights and ideas through the process of engaging in social interactions with others including peers, instructors, and other experts (Bransford, 2000).
- **Connected learning:** Connected learning is a theory developed by Ito et al. (2013) in order to describe learning that occurs at the intersection between academics, peer culture, and learner interests.
- **Learning community:** Learning communities are defined through community of practice theory (Wenger, 1998). In learning communities, more knowledgeable others

(experts) help to integrate new members (novices) into a community through passing on knowledge and language specific to the community.

- **Sex-related topics:** This term has been developed by the researcher in order to refer to a variety of topics related to sexual health, behaviors, attitudes, and practices. Examples include, but are not limited to contraceptives, healthy sexual relationships, human anatomy, and sexually transmitted infections (STIs).
- **Social media:** This term is meant to include a wide variety of networked technological tools such as social networking sites (*Facebook* and *Twitter*), blogging sites (*WordPress*), and other sites (*Youtube*) that provide the opportunity for socialization, collaboration, and production of works (Dabbagh & Kitsantas, 2011).
- **Sociocultural theory:** Theory that views learning as a process that is highly influenced by the context, social interactions, culture, and personal experience of the learner (Vygotsky, 1978).

Chapter II: Review of the Literature

Learning Through Participation: A Theoretical Perspective

When discussing the potential of social media as educational tools for sex education at the college level, it is important to determine whether undergraduate students may learn through participating in online social interaction and collaboration. The theoretical basis driving the current study stems from connected learning theory, which places learning at the center of academics, peer culture, and personal interest (Ito et al., 2013). Connected learning draws from several other theoretical backgrounds including participatory learning (Sfard, 1998), community of practice theory (Lave & Wenger, 1991; Wenger, 1998) and sociocultural learning theory (Vygotsky, 1978). In the following sections, the theoretical background for the study will be discussed in further detail.

Connected learning and the sociocultural perspective

The connected learning theory of Ito et al. (2013) places a strong focus on learning as a socially embedded process while accounting for internet-based technologies as methods for interaction and communication. This has particular relevance when examining social media as educational tools. For connected learning to occur, there must be the presence of social support in the form of others who are willing to assist the learner during the learning process (McKerlich et al., 2011). Today, the availability of internet to college students from anywhere, at anytime allows learners to have frequent and consistent social support from more knowledgeable others (Lai, Khaddage, & Knezek, 2013). Most of the time, these more knowledgeable others come in the form of peers with similar interests, and adult instructors or mentors who encourage and guide learners in their exploration of their interests. The importance of learning through

socialization and meaningful interactions with others makes connected learning theory a predominantly sociocultural theory of learning for a number of reasons.

Sociocultural learning theory is often attributed to the work of Lev Vygotsky, who stated that, “human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them” (Vygotsky, 1978, p. 88). Here, Vygotsky recognizes that learning and development are based on the social interactions of children. More specifically, the zone of proximal development was proposed as the distance between what learners are able to accomplish independently, and what they are able to accomplish with the assistance of more knowledgeable others. In this zone, social support becomes critically important in helping learners to progress in their learning process. Connected learning theory integrates these ideas, focusing on the idea that learners can make connections between their academic work and interests through interactions with a multitude of others. These interactions can be conducted not only through face-to-face contact, but more frequently through the communication channels afforded by the internet and social media.

The social mediation of learning through the internet has been explored to some extent using the sociocultural perspective. The online social networks formed by young adults and teenagers have been identified as important areas of interest for exploring learning (Unlusoy, de Haan, Leander, & Volker, 2013). This analysis adopted a sociocultural perspective, recognizing the importance of culture and interactions with others as critical parts of the learning process. Findings indicated that youth, to a large extent, replicate their offline social networks when forming online social networks. For example, classmates and friends that an individual may have offline are integrated into an online “friends list” such as that found on *Facebook*. Consistent with connected learning theory, more interaction conducted through social media resulted in

higher perceptions of learning among youth. Examples of interactions examined were keeping in touch, sharing resources, productivity, and giving advice or feedback. These findings are consistent with connected learning theory due to the presence of supportive others, whose interactions appear to influence perceptions of learning. However, it is important to recognize that evidence for whether learning outcomes are affected by social media usage is still an area in need of further research.

In another exploration of social media environments through a sociocultural lens, creativity became the focus (Peppler & Solomou, 2011). The social media environment of study was embedded within the larger, multi-user virtual environment *Quest Atlantis*. *Quest Atlantis* has educational functions, presenting concepts to users within the virtual environment and allowing them to construct objects that other users can interact with. The Architecture Unit of *Quest Atlantis* was used to determine how users expressed their creativity, and how they engaged in collaborative design with other users. The sociocultural lens was found to be particularly appropriate to use for this study. Users established a creative culture and community in which new ideas spread and were expanded upon through the design of new buildings. Peppler and Solomou (2011) recognized the rapid spread and sharing of information and the high frequency of conversation as important factors driving the creative process of users in the *Quest Atlantis* environment. These ideas are again relevant to connected learning theory, with technology mediating the communication between members of a learning community.

Participation in learning communities is seen as one of the “three P’s of pedagogy for the networked society” by McLoughlin and Lee (2008). The other “P’s” are personalization and productivity. Taken together, there is an established connection between the choice of the learner to actively engage in learning, the need for learners to feel that they are supported in their

interests, and the motivation of the learner to be productive. Learners in the 21st century are described as members of a “culture of participation,” which aligns well with sociocultural perspectives and connected learning theory. The participation metaphor of Sfard (1998), mentioned in previous sections, is a long standing lens for viewing learning, and is contrasted with the acquisition metaphor in which the learner is a more passive receiver of knowledge from an external source. Again, the learner as an active participant in their learning process is emphasized in alignment with the interest-based knowledge seeking of connected learning theory (Ito et al., 2013). However, Mcloughlin and Lee (2008) suggest that there is the need for the creation of new metaphors that more appropriately describe learning in the 21st century. While the participation metaphor is still relevant as a description of learning at the individual level, it fails to capture the collaborative, networked nature of learning through social media and the internet.

The framework of everyday expertise elaborates on the importance of collaborative learning in recognizing that there is a complex interplay between the individual, culture, and social interaction (Zimmerman & Bell, 2012). Everyday expertise is a framework that has developed in response to the need for consideration of learning conducted in informal learning environments. Informal learning, just as much as formal learning in the classroom, is seen as a valuable and frequent addition to the development of the learner. Here again, bridging the gap between formal and informal learning is seen as a target area for analysis. Everyday expertise is predominantly sociocultural, with the learning context and learner characteristics playing important roles. Zimmerman and Bell (2012) cite an example of everyday expertise through the *Micros and Me* curriculum. Through *Micros and Me*, fifth grade students are encouraged to use digital photography in their home and informal out of school environments. The purpose of the

curriculum is to encourage students to make connections between what they learn in class about staying healthy, and the pictures they take of everyday objects that they identify as contributing to their health. The integration of technology, relevance to the informal, daily activities of the students, and classroom concepts in the *Micros and Me* curriculum provides a good representation of not only the interplay between the components of the everyday expertise framework, but also connected learning theory. This is mediated by the support of the instructor, peers, and members of the local community who play a role in supporting student endeavors. In order to further elaborate upon the complex, socially mediated nature of learning, community of practice theory and collaborative learning will now be discussed.

Communities of practice and collaborative learning

Collaboration between learners has been identified as an important part of the learning process (Bransford, 2000). Specifically, collaborative efforts allow learners to give and receive feedback from peers and instructors resulting in the formation of new ideas and insights. Feedback is especially important in instances where learners must complete large projects requiring revision and resubmission. The articulated insights and arguments that result from collaboration with peers can encourage learners to gain new perspective, improve their own work, or to fill in the gaps that they may have in their own knowledge. Feedback can be continuous and frequent when mediated through social media since learners and instructors have the ability to interact at any time asynchronously or synchronously.

One of the core concepts embedded within connected learning theory (Ito et al., 2013) is the idea of learning through collaboration and interaction with others. This concept derives its theoretical background from the community of practice theory of Wenger (1998). The formation of communities of practice is dependent on a supportive group of individuals made up of experts

and novices. Experts maintain a degree of participation central to the community, ensuring that they are supporting the development and learning of the individuals who come into the community as new members or novices. Communication is seen as essential to the structure of the community itself, with members sharing unique language, traditions, and goals. Groups that are formed through social media can be seen as communities of practice when they are organized around particular interests. For example, health support groups organized through *Facebook* have been found to provide members with emotional support as they learn about health issues resulting in higher self-efficacy with their new knowledge (Oh, et al., 2013). Forums created by Harry Potter fans can become communities of practice in which members have the opportunity to post fan-fiction for review and feedback from other community members (Ito et al., 2013).

Hill (2012) distinguishes three different types of learning communities: directed learning communities that are formed within a formal classroom setting and bound by the rules of the instructor, negotiated learning communities in which both the instructor and students play parts in the formation and maintenance of the community, and informal learning communities that form outside of the classroom. Informal learning is again recognized as a major player in 21st century learner experiences, with social media acting as a contributing factor in providing environments for informal learning communities to form. Hill (2012) explains that all learning communities, formal or informal, have a number of important theoretical characteristics. Some of the most relevant in this exploration of collaborative learning include the idea of social presence, social interdependence, and situated learning. Social presence is described as the awareness of interpersonal relationships with others within a community. Social interdependence is the ability of community members to cooperate and collaborate in order to reach common

goals. Finally, situated learning emphasizes the importance of the context in which learning occurs – in this case, within the community and in tandem with other community members.

The formation of online learning communities has been reviewed in detail by Kreijns, Kirschner, and Jochems (2003). The development of an affective structure is one thing that they identify as integral to community formation. Affective structure refers to the sense of emotional and social support that community members build with one another based off of their interests, cooperation, desire to remain a part of the community, and common goals. Affective structure is not only affected by formal cooperation and productivity, but also informal interactions such as casual conversation about non-task related topics. When communities promote a positive learning environment in which members support one another as individuals and maintain relationships, the opportunity to learn from one another increases. The relationships that form within online communities of practice contribute to the sense of social presence that members have. Kreijns et al. (2003) propose that the effective integration of collaborative activities into online learning environments requires the inclusion of intentional prompts to promote group discussion and interaction. Interactivity is also important for group cohesion, and encouraging community members to explore different types of external resources can also result in information sharing and insights.

The interactions between members of communities of practice can be examined as instances of collaborative learning because of the distinct social force driving the transfer of knowledge between members. Collaborative learning through social media has been recognized as dependent on the integration of social affordances included within the learning experience (Tay & Allen, 2011). Specifically, the use of social media by an instructor in order to provide information, or as a way to complete assignments must be paired intentionally with the ability

and encouragement to interact with others. This aligns with the peer culture facet of connected learning theory in which interaction with peers, and the use of social media sites that are popular among peers can be engaging gateways for informal learning experiences. Allowing and encouraging social interaction among classmates and peers may lead to the development of learning communities through fostering social presence as mentioned by Hill (2012).

Baird and Fisher (2005) have also recognized that social media may encourage the formation of learning communities in their exploration of 21st century learners and their “always on” learning process. These new learners are seeking learning experiences that allow them to personalize their learning, socialize with one another, and make use of popular technology. The paper acts as a call for more intentional integration of social media when designing online instruction. Communication through the web is described as a process of knowledge aggregation in pools that can be accessed by anyone through the internet.

Many strategies aimed at integrating social media into current pedagogy draw from the work of Vygotsky (1978) in which the social support of others provides a way for learners to accomplish much more than they may have been able to accomplish individually. These include allowing learners to mediate their communication with others through social media, the integration of multiple types of internet media, and engaging content that will appeal to the interests of the learner (Baird & Fisher, 2005). Connected learning theory would suggest that these strategies could encourage learners to find information from multiple sources, share them in personally meaningful ways, and thus create the knowledge base for a learning community to form. The aggregation of ideas and resources from across the internet requires a collaborative effort on the part of learners to expand their knowledge base, provide feedback on one another’s ideas, and draw conclusions.

Collaborative learning need not only involve peers, but also experts in the learner's area of interest, and instructors that choose to integrate social media into their classrooms. Bransford (2000) describes affordances associated with "collaboratories," which are digital learning communities designed to promote discussion and sharing of research between experts as well as students who are performing research in the field of interest. Bransford (2000) makes mention of *Global Lab*, an initiative that puts students into contact with scientists doing research on global issues. *Global Lab* allows students to take the role of the researcher, discussing research project designs, providing and receiving feedback from scientists, and sharing the results of their research. *Global Lab* can be viewed as a collaborative online effort to conduct scientific research, mediated by the social interactions within a mixed community of novice and expert members. Through interaction with experts, students are able to participate in scientific discussions and projects that might not have been possible without guidance.

Collaborative learning has also been examined in a case study of the social media environment *Scientific INquiry* or *SINQ*, which is designed to promote scientific inquiry (Ahn, Gubbels, Yip, Bonsignore, & Clegg, 2013). The *SINQ* social media environment allows participants (in this case, youth aged 8-11 years) to explore scientific challenges, post questions about the challenges, propose solutions, provide or receive feedback, and expand upon the posts of others. These affordances are consistent with many other forms of social media, and are meant to encourage active contribution to the knowledge base. In this study, the types of interactions that youth chose to engage in were tracked. Primary interactions were interactions that involved the creation of original content (for example, asking a new question, proposing a new project, or reporting results). Secondary interactions involved contributions to content that was already created (for example, providing feedback or voting to prioritize questions or project ideas).

While the types of interactions youth used varied over time, the findings indicated that *SINQ* could be a useful tool for supporting collaboration for scientific inquiry. The environment resulted in the formation of a community of practice in which youth were able to articulate their ideas, receive feedback, and adjust accordingly. New material contributed, and feedback given and received served to expand upon the knowledge of the community as a whole.

Engagement: Exploring personal interest within connected learning

One of the three major players in connected learning theory is the personal interest of the learner (Ito et al., 2013). In order for learners to connect their classroom learning to relevant situations in their everyday lives, it helps to make the material engaging through appealing to personal interests. For example, a learner who is interested in anime may spend hours looking through manga comics, watching subtitled versions of the latest episodes, and even learning how to draw their favorite characters. By contrast, the same learner may not feel as if they are learning anything when they attend chemistry class since they don't have a personal interest in chemistry. Understanding the role that interest plays in learning and the strategies that can help to capture the interest of learners have important implications for how social media (an already popular and familiar technology to young adults), can be appropriated as educational tools.

Jones, Watson, Rakes, and Akalin (2012) have developed the MUSIC model of engagement, standing for eMpowerment, Usefulness, Success, Interest, and Caring. eMpowerment represents learner perceptions about having the ability to personalize their learning experience. Usefulness represents the establishment of relevance to the learner as an individual. Success represents the perception of the learner as capable of reaching learning goals. Interest is the personal interest of the learner. Finally, Caring represents the learner perception that the instructor cares about him or her as an individual. These five factors represent areas of

focus when implementing instruction, and have been found to relate to high student engagement and positive attitudes towards learning. If an instructor works on improving any of these areas, concurrent improvements in the other four areas have also been found to occur. The MUSIC model provides an interesting perspective when viewed alongside the ideas associated with connected learning theory. It can be argued that engagement is a phenomenon that must occur in order for connected learning to occur in the first place.

To reemphasize, connected learning theory blends informal and formal learning through connecting academics to learner interests with the support of peers, instructors, and members of the community (Ito et al., 2013). The MUSIC model presents five factors that should be considered in order for learners to bridge these seemingly independent areas and draw connections between what they have learned in different environments. These factors have implications for how social media can be used as educational tools. Social media have already been established as a popular technology among young adults, meaning that interest is already high among undergraduates, the target population for this study. Undergraduates that appropriate social media for their personal use may already have a great deal of familiarity with the technology making their perception of success with social media high as well. eMpowerment is also something that may be high among the target population due to the ability of young adults to choose which types of social media to use, how they will use social media (uploading pictures, sharing links, chatting), and who they will choose to keep in touch with through social media. This leaves the areas of usefulness and caring as areas to improve upon when integrating social media into educational environments. Usefulness might be established through the inclusion of information that young adults find important or relevant to their daily lives. In this case, information on sex-related topics such as contraceptives, STIs, local resources, and fertility will

be included in hopes that undergraduates will see the importance of this information as they navigate sexual relationships. Caring can be established through the consistent and frequent presence of the researcher through social media. Social presence has previously been discussed as the perception that the learner has relationships with and support from others in online learning environments (Hill, 2012). Social presence might be established through the prompt response of the researcher to inquiries, frequent posting of learning materials and resources, and participation in facilitating discussions.

Mcloughlin and Lee (2008) in their discussion of the “three P’s” of pedagogy, reemphasize the importance of personal interest through their inclusion of personalization as one of the three major categories of interest. Personalization is discussed as a major part of 21st century learning, and includes the ability of the learner to choose the ways that they learn, customization of learning environments and instruction to suit learner interests and goals, and self-directed inquiry. The ability of the learner to create personalized learning experiences can be mediated through their interests, consistent with connected learning. For example, one learner mentioned by Ito et al. (2013) became interested in customizing his *MySpace* page. While this particular learner did not have any experience with HTML coding initially, his interest drove him to learn how to code, providing him with expertise in his interest area. The *MySpace* layouts that this learner develops are the result of personal interest in customizing backgrounds, self-directed inquiry in order to learn how to code, and concurrent customization of the way that coding was learned (for example, what resources to use and when to spend time researching coding).

Summary

In this section, the theoretical background informing the proposed study has been outlined. The connected learning theory of Ito et al. (2013), blending academics, peer culture,

and learner interests, has been established as an appropriate perspective with which to view social media as educational tools for collaboration. Embedded in sociocultural learning theory, connected learning recognizes the importance of socially mediated interactions with supportive others within a learning community. Engagement of learners through the use of social media is also an important area to focus on, as it relates strongly to the personal interest dimension of the connected learning experience. With today's undergraduate students already spending large amounts of time interacting through social media, it is of potential benefit to explore the ways that social media can be used to bridge the gap between the classroom and everyday life.

The Role of Social Media: Education and Socialization

From a connected learning standpoint, social media have great potential as educational tools for encouraging collaborative learning and engaging learners. Social media have previously been defined as networked technological tools that allow for and encourage social interaction and communication as well as productivity and creative collaboration (Dabbagh & Kitsantas, 2011). The emphasis on the social affordances of social media technologies is especially important as they are integrated into educational environments, with implications for pedagogical strategy. While young adults are already familiar with social media usage in their personal lives, there are many questions that remain unanswered in regards to whether social media, and especially those originally created for recreational purposes, have a place in school systems and higher education.

Social media are being increasingly utilized in educational settings, making them a trending topic in educational research. The Pearson study of social media usage by faculty in higher education reports that there continue to be increases in social media usage by faculty across three major contexts of personal, professional, and teaching use (Seaman & Tinti-Kane,

2013). Usage has increased across all three contexts when compared with data from 2012, providing further evidence that the potential affordances and limitations of social media usage in higher education should be explored in greater depth. In the following sections, social media usage by young adults, social media usage within educational settings, the affordances and limitations of social media as educational tools, and connections to connected learning theory will be discussed.

Social media usage and young adults

Accessing the internet is an important part of young adult life in the United States (95% of teens and young adults) as indicated by Madden et al. (2013b) in their report on internet usage. Teens access the internet in many different ways, with mobile technologies such as smartphones becoming increasingly used as a point of access. Perhaps as a result of consistent internet access, teens and young adults are also heavily involved with social media technologies (81% of teens), which they appropriate for a variety of reasons (Madden et al., 2013a). In exploring social media usage among teens and young adults, it is important to understand how these populations appropriate social media and what their perceptions towards social media experiences may be.

Some of the predominant reasons that young adults appropriate social media are for recreational purposes such as interacting with friends and maintaining relationships. Social media are perceived as fun and engaging ways to keep in contact with people in a user's social network. When compared with instant messaging services, undergraduate students perceived the social networking website *Facebook* as a place for relaxation, entertainment, and escape, also providing a way for users to keep up with social information (Quan-Hasse & Young, 2010). Undergraduates within the same study also indicated that they were motivated to join *Facebook*

due to its popularity with friends, and the idea that “everyone else” was using it. A survey of undergraduate *Facebook* usage by Ophus and Abbitt (2009) also indicated that 87.3% of the study participants were using *Facebook* to interact with friends.

A literature review by Hew (2011) examined previous studies in order to determine what motivations students had for using the social networking website *Facebook*. Nine major motives were identified: to maintain relationships that previously existed, to meet new people, for fun or because *Facebook* is “cool,” to increase popularity, to pass time, to express oneself, for learning purposes, for task management, and for activism. Consistent with the previously mentioned literature, keeping in touch with others was the most common motive for *Facebook* usage. The majority of people that students keep in touch with through social media are people that they already have connections with offline. The typical young adult or teenage *Facebook* user has 300 friends in their social network, with 350 being the average for female users (Madden et al., 2013a). Of these, 98% include friends from the same school, 91% include extended family, and 89% include friends that do not attend the same school within their network. By contrast, only 33% of users have friends that they have never met in person,

Another study of undergraduate students indicated that social networking sites (set apart from other social media for the purposes of the study), were the most popular when compared with a variety of other digital technologies such as blogging, instant messaging, and online communities. Time spent using social networking sites was also the highest of all the technologies included in the survey, consistent with its popularity (Yoo & Kim, 2013). While using social media, undergraduate students listed the pursuit of personal interests outside of class as the biggest motivation for interaction, closely followed by keeping in touch with friends.

These data remain consistent with the idea that young adults use social media for predominantly recreational purposes.

Two of the most popular social networking websites among young adults today are *Facebook* and *Twitter*. This makes them attractive social networking sites for further research. Tess (2013), in a review of social media in higher education has described *Facebook* as the “face of online social networks.” However, Madden et al. (2013a) have reported interview data showing that young adults may have waning enthusiasm for *Facebook* due to the social “drama” that occurs through the site. *Twitter* usage, while drastically lower when compared with *Facebook* has the second highest teen usage at 26% up from 12% in 2011. In the time between 2011 and 2012, *Twitter* usage has overtaken that of the previously popular *MySpace* website, which has declined from 24% to only 7%. Interestingly, *Twitter* is not necessarily seen as a form of social media by a subset of teens (Madden et al., 2013a).

Several of the reasons that young adults and teenagers have cited as reasons for their waning *Facebook* enthusiasm can also be seen as concurrent with reasons to maintain a profile. For example, the potential that *Facebook* affords for keeping up to date on the goings on of friends, family, and classmates as well as the capacity for social connection and communication at any time leads to instant gratification (Urista, Dong, & Day, 2009). However, the ability to stay constantly connected to others also means that *Facebook* users are exposed to a constant, and perhaps overwhelming stream of information about the lives of others. Sharing, or oversharing of information is therefore one of the primary concerns associated with the growing popularity of social media in the lives of young adults.

Despite what appears to be waning enthusiasm for *Facebook*, it remains an important part of the undergraduate experience as reported by Selwyn (2009). The *Facebook* content of

undergraduates in the social sciences was examined qualitatively in order to determine how *Facebook* was used as a part of academic life. Several major themes emerged from the data, describing specific types of discourse that students engaged in through the *Facebook* website: reflection about the university experience, the exchange of practical information related to student life, the exchange of academic information, the expression of disengagement or frustrations with the university experience, and casual or humorous talk. Selwyn (2009) also found that students were more likely to interact with people that they already knew in the “real world,” using *Facebook* as a way of maintaining relationships that had originated offline.

The constant interaction with and monitoring of social media profiles by young adults may also have an impact on the ways in which they socialize and form relationships. High school aged students participated in a study to determine how social media usage affected their self-esteem, social-concept, and feelings of depression (Neira & Barber, 2014). Findings indicated that using social media technologies more frequently was a predictor of higher social-concept, meaning that these teenagers had more opportunity to practice social skills and interact with peers, making them feel more competent in navigating social situations. Investment in social media, a separate measure assessed through the same study, was predictive of lower self-esteem and more feelings of depression. The findings of this study also showed gender differences between users and non-users of social media. Specifically, males that had social media profiles reported higher social-concept than males that did not have a social media profile. By contrast, females with social media profiles reported more feelings of depression and lower self-esteem than females that did not have a social media profile.

The ways that teens and young adults are using social media has changed in ways that may also be cause for some concern in terms of privacy (Merchant, 2012). Madden et al. (2013a)

report that teens are sharing more information than they have in the past through social media. For example, 91% of teens share a photo of themselves on their current profiles compared to 79% in 2006. Increases were also found in listings for hometown, school, and contact information. New data also show that teens share information about their interests (84%), birth dates (82%), and relationship statuses (62%) among other things. Despite increases in the amount of personal information that teens share through social media, only around 40% of teens reported that they were somewhat or very concerned about their information being seen by outsiders of their social network. This may have important implications when considering whether social media may be appropriate for use in educational settings.

Social media usage in education

Many different technologies can be included within the category of social media. While prominent social networking websites such as *Facebook*, *MySpace* and *Twitter* have already been discussed within this review, other forms of social media include blogging communities, *Youtube*, virtual gaming environments, and other less prominent social networking sites (Tess, 2013). Faculty in higher education, as well as K-12 educators, are increasingly appropriating social media in order to facilitate learning (Gray, Thomas, & Lewis, 2010; Seaman & Tinti-Kane, 2013). The specific types of social media used vary a great deal from classroom to classroom and course to course. Still, studies show that the community and collaborative affordances of social media remain major purposes behind the use of social media in educational settings.

A case study of 28 undergraduate students explored the educational affordances of the social media site *Graasp*. As part of a course, students were required to complete a group project (creating a website) using *Graasp* to coordinate with group members and to organize and share

resources (Li, Helou, & Gillet, 2012). In this case, a social media site was utilized as a way of promoting collaborative learning and project management. Students created profiles within *Graasp*, and also had the ability to create work spaces where they could collaborate with classmates. Over the course of the project, the majority of interactions between students were postings for links or other resources. Editing the website was the second most prevalent type of student interaction. In relation to student perceptions of *Graasp* as an educational tool, 64% reported that *Graasp* was useful for the organization and sharing of resources as evidenced by the high incidence of such activity. However, only 52% of students reported that they believed *Graasp* increased their motivation to engage in teamwork, which may run counter to the idea of social media usage for collaborative learning purposes. Students also indicated that it would be helpful if *Graasp* allowed them to add contacts from other social media sites that they were already a part of. This reaffirms the idea that students typically associate social media usage with their personal lives and maintaining contact with their friends, family, and classmates (Ophus & Abbitt, 2009).

The idea of using social media technology for collaborative learning purposes is not unique to higher education. *SINQ*, a learning tool exhibiting many of the features of other social media websites, was used in order for K-12 students between the ages of 8 and 12 to learn about the scientific method through the context of cooking (Clegg et al., 2013). Students interacted with one another through *SINQ*, asking questions, adding suggestions, and designing projects to test their ideas. Results of the study indicated that the use of *SINQ* for collaborative learning was effective in bringing learners that did not normally participate into discussions with one another. Students were able to provide feedback to one another through direct chat and discussion, as well as voting for their favorite project ideas and questions.

Voting, a function available in *SINQ*, is similar to the rating system of *ValuePulse*. *ValuePulse*, another social networking website, is a news platform that distributes interesting information about industry trends and events to students and instructors. Students and instructors are able to discuss coursework and current events through *ValuePulse*, as well as to give ratings to information sources that are most relevant or interesting. Wolf, Wolf, Frawley, Torres, and Wolf (2012) examined the use of *ValuePulse* as a way for business and agribusiness students to collaborate, discuss ideas, and make connections. Students using *ValuePulse* showed enthusiasm for the platform as an appropriate way to keep in contact with professors and classmates. However, students did not perceive *Facebook* or *Twitter* as an appropriate tool for communication between students and instructors, indicating that they would prefer a separation between personal life and academic life. Students also reported increases in perceived knowledge and critical thinking skills as a result of using *ValuePulse*.

Social media have also been associated with increased learning outcomes in a case study by Laru, Naykki, and Jarvela (2012) with undergraduate students. Undergraduate students used multiple social media tools in order to facilitate the process of creating a website through individual and collaborative means. The social media tools involved included *ShoZu* and *Flickr* for photo sharing, *Wordpress* for reflective blogging, and *Wikispaces* for the construction of the website, along with several other tools to provide connection between the different services. Statistical analyses of pre and post-test scores of student knowledge and predictors of student learning gain indicated that involvement with the creation and editing of the website, was the most related to higher learning outcomes. The amount of effort and time that students spent editing and contributing to the website was also related to the average number of blog posts per student. It is possible that the process of participating in creating websites, as seen in the current

study (Laru, Naykki, & Jarvela, 2012) and the study utilizing *Graasp* (Li, Helou, & Gillet, 2012) may engage students in ways that traditional classroom instruction or other social media activities do not.

Ning is another social media tool that has been used and examined in a higher education setting (Arnold & Paulus, 2010). Through *Ning*, students were encouraged to use blog, chat, and online discussion features. The ability to work on a group website was also encouraged, but this required the use of a separate tool and was not often used by students. Students indicated that they used *Ning* for the purpose of interacting with classmates and maintaining a learning community through reviewing the work of others in the class, feedback, and chat. When comparing the use of social media sites such as *Ning* to learning management systems such as Scholar or Blackboard, Arnold and Paulus (2010) suggest that learners may feel as if they have greater control over their learning experience. For example the creation and customization of profile pages gives learners control over a specific location within their learning environment. From here, they can choose to communicate with classmates or instructors as they feel necessary. Learning management systems by contrast place learners on the one-way receiving end of information and resources distributed by the instructor, perhaps creating a perceived distance from classmates.

Blogging is a different form of social media compared with *Facebook* and *Twitter*. However, the use of blogging for educational purposes has been recorded in the literature many times as a way to encourage student reflection on their own learning as well as to promote the formation of a learning community open to feedback and discussion. When learners feel as if they are participating in learning communities through blogging, they also perceive that they are learning more. Top (2012) demonstrated this through an exploration of undergraduate pre-

service teachers required to use blogging to record their thoughts during a collaborative group project. Questionnaires were administered to the students throughout the course with the purpose of assessing collaborative learning, sense of community, and perceived learning. Results of the study showed that students had positive perceptions of blogging as a way to collaborate with others, and as a way to improve their own learning. Sense of community was also strongly predictive of perceived learning, with computer skill being a secondary source of variance. Similar results were reported in a study by Halic, Lee, Paulus, and Spence (2010) in which undergraduate nutrition students were asked to respond to a survey measuring perceived learning and sense of community. Students in this study were also required to blog, but for discussion and peer commentary purposes as opposed to collaborative learning. Sense of community through blogging was found to be highly predictive of perceived learning among undergraduate students.

As this section of the review has indicated, social media are being increasingly appropriated by instructors both at the K-12 and college level. In many cases, the establishment of learning communities and collaborative learning opportunities are the main reasons why social media are used in educational settings. Both have been associated with increases in perceived learning by students, and the use of social media has been generally perceived as positive among students. Still, an examination of the potential affordances and pitfalls of social media for educational purposes is necessary in order to more fully understand the implications of integrating social media into academic life.

Affordances and limitations of social media as educational tools

While much of the literature on social media for educational use agrees that social media have potential benefits for encouraging positive student attitudes, collaborative learning, and the formation of learning communities, limitations and concerns have been discussed as well. These

concerns stem from the question of how to engage in the instructor-student relationship through social media, the need to control privacy and security settings, and the perception of social media as a potential distraction rather than a learning facilitation tool (Seaman & Tinti-Kane, 2013).

Perhaps due to the consistent and frequent usage of social media by young adults and teenagers, many students feel positively towards the idea of using social media for educational purposes (Yoo & Kim, 2013; Hrastinski & Agae, 2012). Still, while students may feel open to the idea of using social media to keep in touch with instructors and classmates, faculty do not necessarily feel the same. The unwillingness of faculty to adopt new technologies and social media into their instruction can sometimes inspire frustration on the part of students that are open and willing to have them integrated into the classroom (Gikas & Grant, 2013).

Still, the majority (56%) of faculty in higher education agreed with the statement that social media were more of a distraction than helpful to students (Seaman & Tinti-Kane, 2013). Major barriers that faculty reported to using social media included concerns about the integrity of student work (the primary concern), privacy, and the need to separate personal and course accounts within social media.

The discrepancy between faculty and student perceptions and usage of social media was described in a study by Roblyer, McDaniel, Webb, Herman, and Witty (2010). The study focused on *Facebook* usage, and interesting differences were reported despite 95% of student participants and 73% of faculty being involved with *Facebook*. Faculty surveyed reported that they were much more likely to interact through email (a more traditional method of communication) than *Facebook*, whereas students were equally likely to interact through *Facebook* and email. Additionally, while students were found to be more likely to agree that the use of *Facebook* for instructional purposes would be convenient, faculty were more likely to

agree with the idea that *Facebook* was not appropriate for educational purposes. The Roblyer et al. (2010) study reemphasizes that students are generally more open to the integration of social media into their learning environments than instructors.

The specific concern that faculty have with keeping their personal lives separate from their instructional lives is something that is also shared to some extent by the students they teach. Wolf et al. (2012), in a survey examining the perceptions of undergraduate and graduate students about social media usage in the classroom, reported that *Facebook* was one of the top tools used by lower and upper level undergraduate students for the purpose of communicating with classmates and professors. By contrast, *Google Docs* was the primary tool used by graduate students. However, when compared with a survey examining the social media tools that students found most appropriate for communication regarding coursework, *Facebook* and *Twitter* were reported to be much less appropriate than other social media tools such as *ValuePulse* (the form examined during the study), and *LinkedIn*.

In a study of social media usage by undergraduate leadership students, *Facebook* was reported as the social networking website that students were most comfortable using (Odom, Jarvis, Sandlin, & Peek, 2013). Students were then interviewed to assess the perceived advantages and disadvantages associated with social media usage. Advantages that students reported included the ability to more quickly and efficiently communicate and share resources with instructors and classmates, the familiarity that many students already had with using social media, the ability to more easily collaborate with classmates on group work, and the potential to enhance and improve student learning. Several disadvantages were also reported. Consistent with the study by Wolf et al. (2012), some students indicated that they would prefer to maintain a separation between their personal and academic lives. Students also indicated that social media

had the potential to create a distraction when used as a learning tool, that use of social media might defeat the purpose of having face-to-face instruction, and that students who did not typically use social media could find themselves at a disadvantage (Odom et al., 2013).

Oftentimes, student perceptions of potential affordances are the basis for what has been explored in research on social media within education. Undergraduate students at three universities were given mobile computing devices that allowed them to stay connected to the internet, download applications, and communicate with others via text messaging and phone calls (Gikas & Grant, 2013). These mobile devices were integrated into courses by faculty who had had previous experience in integrating similar devices into their instruction. After the conclusion of the course, students were interviewed and asked to describe the positive and negative experiences that they had while using the mobile devices. The affordances that students described were quick and immediate access to information, constant ability to communicate with classmates and instructors, the provision of many different ways to learn (for example, uploading video memos to be discussed in class), and the ability to engage in learning from wherever the student might have been. Frustrations included difficulty using the mobile devices (for example figuring out how to use certain features) and the potential distraction of being able to engage in activities that were not related to class.

The review article by Dabbagh and Kitsantas (2011) describes social media as promising tools for the development of personal learning environments (PLEs). Personal learning environments are defined as learning environments that use social media technology in order to blend formal and informal learning, and allowing the learner to manipulate and share their own content. This results in the creation of a distinct collaborative component to PLEs due to the community involvement of knowledge aggregation. This is consistent with the social media

affordance of community building, described by Arnold and Paulus (2010), and Halic et al. (2010). Through community building, learners are provided with a sense of social support and the encouragement of more knowledgeable others who facilitate collaboration and productivity.

The perception of social media usage for education by faculty and students may also depend upon the type of social media used. This was evident in the work of Wolf et al. (2012), where students indicated a preference for less commonly used social media platforms over *Facebook* and *Twitter*, websites that are typically associated with recreational and personal use (Yoo and Kim, 2013). For example, blogging, the most popular form of social media usage among higher education faculty for instructional purposes (Seaman & Tinti-Kane, 2013), has been perceived by undergraduate students as a positive way to enhance learning through collaboration (Chhabra & Sharma, 2013). Blogging has also been found to be useful for the reflection of students on their own knowledge, and the creation of learning communities where participants can provide feedback and gain insight through looking at the work of others (Yang, 2009). However, while blogging has been explored a decent amount in the educational literature, blogging usage by young adults and teenagers outside of educational settings has been decreasing according to Lenhart, Purcell, Smith, and Zickuhr (2010). Since it has been established that teens and young adults may prefer to maintain a separation between their academic and personal lives, this may be why blogging is accepted as an educational tool (not as commonly used for recreational purposes) while more popular social networking websites such as *Facebook* and *Twitter* evoke mixed feelings.

Information diffusion through social media is both another potential affordance and a potential pitfall. Three major forms of information diffusion through *Facebook* were identified by Bakshy, Rosenn, Marlow, and Adamic (2012). The first is when individuals share links to

external content and resources, inspiring contacts to explore and share the same links. The second is independent sharing of links by contacts that see the same external resource. The third is when individuals share links to sources internal to the Facebook site, which inspires contacts to also see and share the same links. Bakshy et al. (2012) describe the spread of information and links through Facebook as the result of “contagion.” In an educational context, this contagious spread of information can be potentially beneficial, since students in the same social media community may be exposed to information important for the course, as well as links to external resources that can supplement information from instructors. In this case, information diffusion can contribute to the sense of community that social media usage can facilitate (Merchant, 2012). However, it is also important to understand that the rapid spread of information does not necessarily mean that the information itself is accurate. Here, it should be reemphasized that any educational social media effort should be monitored and guided frequently and consistently by the instructor to ensure that learners receive accurate information (Tess, 2013).

Information sharing among members of a social media or online learning community has been correlated with preferences for mobile learning (Mills, Knezek, & Khaddage, 2014) through a new instrument designed to survey undergraduate learning preferences. The ability to share information as well as to receive information from others can be accomplished easily in online learning environments where communication can be instant. In the model of McLoughlin and Lee (2008), participation in learning communities through collaboration, as well as learner customization of the environment and productivity intersect in instructional strategies utilizing technologies such as social media. The findings of Mills et al. (2014) may serve to reemphasize that the use of mobile technologies increases the opportunity for learners to share information and resources, something that may be important for instructors to investigate as they design

pedagogy for the digital age. The idea of the individual learner within a learning community requires instructors to pay attention to both the needs of the learner as an individual as well as the collaborative interaction of the class and the ways that the two may interact.

eMuse is an integrated social learning environment that links several different forms of social media for the purposes of class activities. Popescu (2014) utilized *eMuse* for the purpose of group collaboration activities assigned to undergraduate students. Students were required to design a web application with their group, with each member of the group taking on a designated role within the project. The social media available and tracked through *eMuse* were *Blogger*, *MediaWiki*, *Delicious*, and *Twitter*, which were included to support the collaborative efforts of the project groups. *eMuse* allowed students to see their interactions through the different social media resources as well as to track their progress in comparison to the progress of others. The desire to keep track of student progress, and the desire to compare individual work to the work of others were found to be the most motivating factors for students to use *eMuse*.

Internet privacy and security are some of the top concerns of faculty in higher education when considering the use of social media (Seaman & Tinti-Kane, 2013). Over 80% of faculty reported important or very important concerns about both privacy risks to themselves as well as privacy risks to students that they taught. These concerns are mirrored by parents (Madden et al., 2013a), with the majority of parents being “very” or “somewhat concerned” with their children’s interactions with strangers online (72%), their children’s reputation management (69%), the information available to advertisers about their children (81%), and the impact that social media activities could have on their child’s future opportunities (70%). Some of the concerns reported by faculty and parents are justified. Further data from the Pew report show that 30% of teenagers have experienced exposure to age-inappropriate advertisements. About one in six, or 17% of

teenagers have also been contacted by someone online in a way that has made them feel uncomfortable.

Perhaps consistent with the openness of students to social media usage, there is also a lack of concern with privacy issues, which conflicts with the concerns of instructors and parents. 60% reported that they were “not too concerned” or “not at all concerned” with issues of privacy through social media. This is perhaps due to the high confidence that teens and young adults have for being able to adjust their privacy settings. For example, 89% of teens report that it is “not difficult at all” or “not too difficult” to adjust their Facebook privacy settings (Madden et al., 2013a). Other points of interest about social media and privacy can be found when comparing the privacy levels that teenagers report for *Facebook* vs. *Twitter* accounts. While 60% of teenage *Facebook* users report that they have set their accounts to be private, 64% of *Twitter* users report that their tweets are set to be public.

Summary

In summary, social media are a popular and engaging set of technologies that have great potential for use as educational tools. Different types of social media were discussed, including the two most popular websites (*Facebook* and *Twitter*), social media platforms such as *Ning* and *SINQ*, and blogging websites. All of these social media formats have been explored in the literature within educational settings. From a connected learning standpoint, the use of social media can encourage learners to aggregate their knowledge in learning communities where ideas can be expanded upon and critiqued. Learners appear to be open and willing to experience social media integration for educational purposes making social media an attractive area for further research. Finally, the ability of the learner to customize their social media learning experiences is an integral factor driving their interactions with others.

Sex Education Efforts and Social Media

The Kaiser Family Foundation reports that friends and media sources are the top two sources of sexual health information for teenagers and young adults between the ages of 15 and 25 (Hoff, Greene, & Davis, 2003). These sources of information are different from the primary sources reported by younger teenagers of 13 or 14 years of age (school, friends, and parents) indicating a shift in the information seeking behaviors of young adults as they age. Media resources, the second most prominent source of information among 15-24 year olds, include television, the magazines, and the internet, potentially making information obtained through social media a factor that affects the sexual behaviors and practices of teenagers and young adults. This age range is particularly relevant to the proposed study since it includes the age range for the typical college undergraduate.

While parents and school are not reported as the most important sources of sexual information, they are still rated highly, with 68% of young adults 15-24 years of age reporting that they learned “a lot” or “some” from parents and sex education classes at school (Hoff et al., 2003). Sex education classes have been a heavily debated topic in the United States, as evidenced by the high amount of variation in the amount of regulations from state to state, and content included in sex education programming (Guttmacher Institute, 2014). Formalized sex education is generally taught sometime during K-12 education. However, after young adults graduate high school and begin transitioning into college environments, sex education becomes a great deal more informal with information obtained through self-directed internet searches and casual conversations with peers. Undergraduates come to college from many different places, bringing different amounts of knowledge and experience to the sexual health information pool. As a result, providing sex education to undergraduate students may serve to clear up

misconceptions and provide new information. All of these issues will be discussed in greater detail within this section of the literature review.

Young adult knowledge of sex-related topics

Sex-related topic knowledge varies a great deal among young adults and teenagers. Variation in formalized sex education programming is most likely responsible for some of this variation (Guttmacher Institute, 2014). However, sex-related topic knowledge is also affected by other informal sources of sex education such as parents, siblings, significant others, the internet, other sources of media, and the information or misinformation provided by friends (Hoff et al., 2003). Understanding what young adults know or do not know about sex-related topics such as contraceptives, fertility, and sexually transmitted infections (STIs) can provide valuable information about what should be included in sex education efforts at all levels.

Hoff et al. (2003) reported on the sexual health topics that young adults were most interested in knowing more about. 77% of all young adults between the ages of 15-24 indicated that they would like to know more about any sexual health topics. This response indicates that sexual health information of any kind would be appreciated by the majority of young adults. The second and third most highly rated topics of interest were how to know whether an individual had contracted HIV/AIDS or other STIs (60%), and knowledge of the different types of birth control and other contraceptives available (57%). These statistics suggest that more than half of the young adult population in the United States may not be receiving enough information about contraceptives and protection from STIs. When compared with data from the Guttmacher Institute (2014) on sex education programming in the United States, this desire for more information makes sense. Only 18 states require that information on contraceptives be presented within formalized sex education curricula (a characteristic identified with comprehensive sex

education programming). In contrast, 37 states require that information on abstinence be covered, with 25 states requiring that abstinence be stressed and 12 requiring that it be covered.

Knowledge of contraceptives has been found to be lacking among young adults in the United States by Frost, Duberstein, and Finer (2012). A survey of 1800 unmarried women and men between the ages of 18 and 29 assessed young adults on their knowledge of contraception as well as their beliefs and attitudes towards contraceptive practices. Over half of young adults had scores of C, D, or F on the test of objective contraceptive knowledge. In addition to this, six out of every ten young adults underestimated the efficacy of oral contraceptives. More specific study results showed that the contraceptive knowledge of women was inversely related to their expectancy for engaging in unprotected sex, establishing a relationship between knowledge and behavior. Increased contraceptive knowledge among women was also positively related to their usage of hormonal or other long-lasting birth control methods. Similar relationships were found in men, with higher knowledge of contraceptives decreasing the expectancy to engage in unprotected sex, and increasing the likelihood that their partner used a long-lasting birth control method.

Several studies have further explored the knowledge gaps that young adults and teenagers have about sex-related topics. Wynn, Foster, and Trussell (2009) categorized over 1000 question-based emails sent to a sexual health information service (Not-2-Late.com) in order to determine major misconceptions and concerns of young people. The five major themes that emerged were misconceptions about which sexual behaviors would lead to pregnancy, the definition of protected vs. unprotected sex, timing of pregnancy and tests for pregnancy, the dangers of emergency contraceptives, and the function of emergency contraception compared to abortion. While it was not possible for the research team to track where these emails came from

or where these misconceptions may have originated, they do propose that misinformation may originate from abstinence-only sex education curricula and inaccurate internet sources. The emergence of misconception themes centered around contraceptive usage and fertility is consistent with the evidence of Frost et al. (2012), and Polis and Zabin (2012) showing that young adults often score low on assessments of contraceptive and fertility related knowledge. It is also interesting to note that this lack of knowledge persists despite eight out of ten young adults reporting that they had received sex education (Polis & Zabin, 2012). This may provide evidence to substantiate the claims of Wynn et al. (2009) suggesting that abstinence-only sex education may be a contributor to misconceptions.

The work of Cohn and Richters (2013) examined sexual health forums online in order to further explore the concerns and knowledge gaps that young people have about sex-related topics. Similar to the study by Wynn et al. (2009), concerns and questions were analyzed, leading to the emergence of major categories or themes. The categories included concerns and gaps in knowledge about tampon usage, menstruation, hormonal contraceptives, STIs (mainly concerned about transmission), signs of pregnancy, “normal” vs. “abnormal” sexuality, and masturbation. Again, the questions that young adults and teenagers have about contraceptives and fertility (or pregnancy) are consistently seen as a major theme within the types of questions that they commonly ask. Cohn and Richters (2013) suggest that young adults may be seeking sexual health information in ways that do not result in medically accurate information. For example, searching for information based on symptoms such as “itchy vagina” through Google may bring up pages of user-generated content. Searches with more formal terminology, such as the name of the specific STI are much less common, but are more likely to result in trustworthy websites.

A study by Flowers-Coulson, Kushner, and Bankowski (2000) has also explored the misconceptions and concerns that young adults have about sex-related topics. The study examined questions submitted to an “Ask the Expert” style web page. Flowers-Coulson et al. (2000) reported that young adults lacked knowledge, specifically in the area of sexual behaviors resulting in pregnancy or STIs, suggesting that young adults may have misunderstandings about fertility based upon hearsay or things that they have been taught. The study also indicated that many of the young adults that had asked questions were anxious about the possibility of being pregnant whether or not they had used appropriate contraceptives. Major categories identified were consistent with previously mentioned studies, with the top three being questions about pregnancy and childbirth, sexual behaviors and associated risks, and reproductive health issues such as contraceptives, STIs, and sexual function.

Efficacy of sex education curricula

It has been mentioned previously that sex education curricula are diverse in terms of content and location. While some states have specific guidelines for the content included in formalized sex education, others do not. While some schools may provide comprehensive sex education with detailed descriptions of birth control methods, sexual orientation, and STIs, other states may provide sex education programs primarily concerned with promoting abstinence before marriage (Guttmacher Institute, 2014). Understanding the factors that make sex education effective may help with the process of designing new curricula for formalized sex education, as well as methods of informal sex education such as web pages and social media campaigns.

Both abstinence only sex education and comprehensive sex education have been found to be associated with healthier sexual behaviors and practices compared to an absence of sex education, as reported by Lindberg and Maddow-Zimet (2012). The study analyzed data from a

nationally representative household survey of teenagers and adults between the ages of 15 and 44, as well as face-to-face interview data about formal sex education from a sample of teenagers and young adults between the ages of 15 and 24. Before first instance of sexual intercourse, two thirds of females, and 55% of males reported having had formalized sex education that included information on both abstinence and birth control methods, 20% of all respondents reported having received formalized sex education on abstinence only, and 16% of females and 24% of males reported no formalized sex education at all. No statistically significant differences were reported between abstinence only sex education and comprehensive sex education and their effects on delayed first sexual intercourse. However, there was a significant difference reported for contraceptive or condom usage among females. Females that received comprehensive sex education were significantly more likely to report using a contraceptive method at first sexual intercourse. No significant differences for type of sex education were reported for males (Lindberg & Maddow-Zimet, 2012).

A study of undergraduate students at a British university provides further evidence for the efficacy of formalized sex education programs in reducing the incidence of unprotected sexual intercourse (Vivancos, Abubakar, Phillips-Howard, & Hunter, 2012). Students responded to an online survey that included questions related to the primary sources of sexual health information that they had utilized at the age of 14, their experiences talking to parents about sexual health, and first experience with sexual intercourse. Formalized sex education was reported as the second most important source of sexual health information, followed by friends within the same age group. Formalized sex education was found to be statistically significant in reducing the likelihood that a student had recently engaged in unprotected sex, and the likelihood that a student had ever received an STI diagnosis.

Kirby, Laris, and Roller (2007) conducted a review of 83 different studies from around the world. Studies included in the review measured the impact of formalized sex education, on sexual behavior for young adults of 25 years and under. Two thirds of the studies reviewed significantly improved the sexual behaviors of the young adults that were involved. A variety of improvements were noted including increased condom and other contraceptive usage, delays in first experience with sexual intercourse, reduced numbers of partners, and reduced sexual risk-taking. On closer examination of the studies resulting in improvement, 17 characteristics of effective sex education programs were identified. These characteristics also remained stable upon replication of the same sex education programs in different contexts. Characteristics associated with effective sex education programs were divided into three categories: steps to take when designing the actual curriculum, the content included within the curriculum, and how the curriculum was implemented.

While it is essential to understand the efficacy of formalized sex education curricula in promoting healthy sexual behaviors and practices, it is also important to recognize that other, less formal sources of information are also popular among young adults and teenagers as they seek answers to their questions on sex-related topics. Secor-Turner et al. (2011) performed a study to determine the effect of informal sources of sexual health information on the sexual behaviors of teenagers and young adults between the ages of 13 and 20. The study determined that peers and siblings were the most commonly reported sources of sexual health information. Other options included in the study for selection included parents, schools, clinics, religious organizations, the internet, other media such as television or radio, and print sources such as newspapers or books. Specific results showed that ninth grade students reporting any of the informal sources had a significantly higher chance of having used contraception during the last instance of sexual

intercourse. Ninth and twelfth grade students reporting any of the informal sources were also significantly less likely to be involved in a pregnancy. These results indicate that informal sources of information on sexual health do have important effects on the sexual behaviors and practices of young adults and teenagers.

Sprecher, Harris, and Meyers (2008), in a study of over 6000 undergraduate students over a 17-year time period, determined that informal sources were the most commonly reported as primary sources of information on sex-related topics. Overall, the most common informal source was peers, particularly of the same sex. Other common sources reported were dating partners, peers of the opposite sex, the media, and independent readings. Some of the least common sources reported were parents and teachers. Trends were observed in the types of sources that undergraduate students relied upon for information. Specifically, informal sources such as the media, peers, and professionals became increasingly popular towards the end of the study range. It is especially important to note the increase in media as an important source of information over time. Media as a source can encompass many different technologies and sources including television, magazines, movies, and the internet. Increases in young adult utilization of media to seek information on sex-related topics suggests that media may provide some attractive methods for disseminating important sexual health information. Specifically, since it has already been established that social media are used frequently for social interaction among peers, an important informal source of sex education, it is possible that they may have many affordances in a sex education context.

Sex education efforts through social media

A review by Gold et al. (2011) examined the use of social media for sexual health promotion. The criteria for inclusion in the review were more fairly lenient, with the authors not

only conducting a search of the existing literature, but also exploring social networking websites in order to identify sexual health promotion activities being currently conducted. It is important to note that, while 178 sexual health promotion efforts were included in the review, only one effort was identified through a search of the published literature at the time. This indicates that many of the sex education efforts through social media are unreported along with their potential efficacy or inefficacy. The majority of the activities were conducted through *Facebook* (71%), with *MySpace* (46%) and *Twitter* (30%) being the second and third most utilized social networking websites. The active usage, organizations responsible for the efforts, reach, and strategies used varied a great deal among efforts, again reemphasizing that while social media are being utilized for the purpose of sex education, there is a need to understand what aspects of these efforts are effective or ineffective.

One of the first studies to explore the use of social media for the purpose of sexual health promotion and education was a study conducted by Nguyen et al. (2013). The Facespace Project was designed for the purpose of collecting survey data about sexual health behaviors and delivering sexual health promotion messages through the social media site, *Facebook*. The target population consisted of teenagers and young adults between the ages of 16 and 29 in Australia. In order to reach members of the target population, *Facebook* advertisements, flyers, emails to previous research participants, and photo tagging were used as promotional strategies. Videos portraying characters developed for the project were posted to *Facebook* pages throughout the course of the study. In the videos, as well as through text on *Facebook*, characters discussed sexual health topics and encouraged more dialogue about sexual health. Characters had their own *Facebook* pages, allowing fans to follow specific characters and more easily link to the central Facespace Project page.

By the end of the project, Nguyen et al. (2013) reported 900 *Facebook* fans across all of the Facespace Project pages. However, it was difficult to determine how many of these fans were mutually exclusive to a specific page. For example, a fan of multiple characters may have “liked” multiple pages. While the study did not measure the effect of the social media project on sexual health behaviors, it did provide insight about the implementation of social media projects focused on sexual health. *Facebook* advertisements including sexual content were not permitted to users under the age of 18, which may have prevented the Facespace advertisements from reaching the younger members of the target population. Increases in fan numbers were also found to occur at three specific times. The first was the launch of the program (at which point, there were emails sent to previous research participants), the second at the promotion of the first survey through *Facebook* advertising, and the third as the characters from the videos were tagged in photos with young people attending a music festival. These usage data suggest that the utilization of advertising and photo tagging may be effective strategies in extending the reach of sex education efforts through social media.

While the work of Nguyen et al. (2013) focused predominantly on reaching young adults and teenagers through social media, the work of Bull, Levine, Black, Schmiede, and Santelli (2012) took a more interactive approach to educating young adults through social media. Also conducted through *Facebook*, the study included a control group that was asked to interact with a *Facebook* page for news related activities (18-24 News), and an experimental group that was asked to interact with a *Facebook* page designed to provide sexual health information, resources, games, and quizzes (Just/Us). Participants were recruited through a referral-based system. Initial participants were recruited through advertising in community newspapers and through the internet (for example, posts on popular websites) and were then asked to recruit three other

participants who might also be interested in the study. A total of 652 participants agreed to participate. Survey data regarding sexual health behaviors were collected at the start of the study, and at two and six months after the end of the study. Results indicated that there was a statistically significant difference in condom usage at the two month follow up between control and experimental study groups, with the experimental group reporting increased condom usage. The experimental group also reported a stable proportion of protected sex acts at the two month follow up compared to the control group, which experienced a decrease in the proportion of protected sexual acts. The results of Bull et al. (2012) imply that, at least in the short term, sex education efforts through social media may be effective in improving healthy sexual behaviors and practices. However, these effects may even out or decrease after two months making continuous exposure to information on sexual health of potential importance.

Another way in which social media have been utilized for the purposes of sex education is through the development of peer-supported efforts. The Harnessing Online Peer Education (HOPE) effort is a *Facebook* initiative aimed at training peer educators to instruct others about HIV/AIDS prevention (Jaganath, Gill, Cohen, & Young, 2012). HOPE focuses heavily on populations that are at risk for HIV/AIDS based upon race and sexual orientation. The peer educators that are recruited are members of the target population that are better able to relate to their peers and to be looked upon as more knowledgeable others. Training includes the development of content knowledge about HIV/AIDS, comfort with initiating conversations about HIV prevention through social media, comfort with *Facebook* itself, understanding for the sensitive nature of the topic and the barriers to HIV prevention, and leadership based upon regular communication with peers. While the effects of the HOPE social media initiative have

yet to surface, its development shows how social media are becoming increasingly targeted as a way to reach young adults and teenagers with sexual health information.

Summary

In this section, sex education has been explored in detail as a specific area of need for undergraduate populations. Due to the variability of formalized sex education curricula across the United States, new undergraduates may have very different understandings of healthy sexual behaviors and practices. Informal sources of sex education, including social media, have therefore received some attention as areas of interest. Major areas of misconception have been identified, as well as some of the interventions that have taken place through social media in an effort to provide accurate information to a wider audience. Despite the presence of interventions that have been implemented through social media, there is very little reporting of results within the literature, and very little specifically targeting undergraduate populations specifically. This reemphasizes the need for more research regarding the efficacy of social media as educational tools for sex education at the undergraduate level.

Chapter III: Methodology

In this chapter, the purpose statement will be expanded and the research questions revisited. Specific descriptions of recruitment and research participants, instruments for data collection, procedures and study timeline, data analysis, and study approval will be provided. The chapter will conclude with a summary.

Purpose Statement and Study Design

The purpose of this study was to explore undergraduate experiences of learning about sex-related topics within an informal social media environment (*Facebook*). The study adopted a mixed-methods approach using the sequential exploratory design strategy of Creswell (2009). Mixed methods research involves the triangulation of qualitative and quantitative data sources to provide thorough analysis of the research topic (Jick, 1979). The sequential exploratory design specifically emphasizes qualitative data collection as the primary data source, with the collection of quantitative data to support the analysis. Because the design is sequential, data collection occurs in distinct phases. The study began with the collection of pre-study quantitative self-report data via the *Qualtrics* survey system. This was followed by a seven-week phase of qualitative data collection through the social media website *Facebook*, another phase of post-study quantitative survey data collection using *Qualtrics*, and a final phase with an hour and a half long focus group. The sequential exploratory design has been described as particularly useful in studies where new phenomena are being investigated. For example, Cabrera (2011) has used the sequential exploratory method to examine intersectionality associated with the male gender, race and higher education, an idea that had not been explored empirically prior to the study.

While developmental research is a commonly used research formula in the field of instructional design, the proposed study emphasizes the learning experience of participants through social media rather than the development of instructional materials through social media. Richey, Klein, and Nelson (2004) describe developmental research as the process of creating instructional materials through iterative change and evaluation. By contrast, the use of a mixed methods approach has allowed for in-depth qualitative exploration of undergraduate learning experience, supported by the presence of quantitative survey data. While social media are being explored as educational tools, the purpose of the study is not to develop new curricula, but rather to explore the learning experience of undergraduate students and their openness to using social media for educational purposes. The affordances and limitations of social media for educational purposes have been touched on and reviewed by multiple authors. However, there is a lack of evidence supporting or denying the efficacy of integrating social media into educational experiences. This study was conducted to provide evidence for the ways that undergraduates experience learning through social media. Special attention was given to exploring the ways that undergraduate students appropriate social media for formal and informal learning, and to identifying recommendations and challenges associated with social media integration into educational settings. Sex education provided the context and the information content for the study, as it is an identified area of need for the target population.

Research Questions

The research questions for investigation included the following:

1. Does the use of *Facebook* as an educational tool support connected learning as indirectly measured by the associated factors of:

- a. Open and positive attitudes towards blending recreational and academic social media usage,
 - b. Involvement with social media for the purpose of learning or participating in academics, and
 - c. Evidence of community interaction?
2. How can social media be used as educational tools for promoting collaborative learning experiences?
 3. How and why do undergraduate students access social media as part of their formal and informal college experiences?

Participants and Recruitment

Participants were undergraduate students enrolled full time at the researcher's university. To provide informed consent, participants were obligated to meet specific requirements including: being aged 18 years or older, being enrolled full time, being unmarried, and currently having a *Facebook* account.

Participants were originally recruited from two sections of General Biology, a course that focuses on major principles of the biological sciences with no major requirement for enrollment. Professors were contacted prior to the start of the fall semester, and permission was granted for recruitment from the two General Biology sections via a combination of email and "start of class" presentations. The recruitment period occurred over the first two weeks of the fall semester, beginning with an email to both General Biology sections with information about the study and a link to the pre-study *Qualtrics* survey. In addition to this email, the researcher gave a brief 5-10 minute presentation to each class section during the first week of fall semester classes.

A second email was sent out during the second week of the recruitment period. The recruitment pool at the beginning of the study included approximately 600 students.

Due to low response rate after the first week of recruitment, the recruitment pool was expanded to include three sections of a General Chemistry course, and one section of an online course called Principles of Peer Leadership. Due to time constraints, the recruitment email was sent out once only in an attempt to expand the participant pool. The total recruitment pool after additional recruitment was 1678 students. At the end of the recruitment period, a total of 32 participants completed the pre-study survey, with 22 participants continuing on to join the *Facebook* study group. *Facebook* group was titled “Learning for Health: Fall 2014.” Participants that did not join the *Facebook* group were contacted up to three times in an attempt to find out whether there was confusion with the process of joining the group, or whether they still intended to participate. By the end of the study, 17 students remained. Three students withdrew from the study during week one, one during week three, and one during week four.

Sample

Statistical analysis only included pre and post-survey data from the 17 students who completed the social media phase of the study for the purposes of comparing results. The final sample of 17 students had an average age of 18.6 years, and were predominantly in their first, or freshman year of college. Out of the 17 total participants, 13 were female and four were male. 11 identified as white, 1 as black or African-American, 4 as Asian or Pacific Islander, and 1 as “other.” In terms of major, 7 identified as Undecided or University Studies, 4 identified as General Engineering, 2 as International Studies, 1 as General Biosciences, 1 as Microbiology, 1 as Classics, and 1 as Physics.

Role of the Researcher

In this study, the researcher adopted the role of the participant-observer. In quantitative research, the researcher is quite removed from interaction with participants (an “outsider”). However, through qualitative research, the researcher may become more actively involved with research participants (an “insider”) in order to further explore the phenomenon of interest (Dwyer & Buckle, 2009). This study involved both quantitative and qualitative data collection, which necessitated that the researcher adopt multiple roles. The role of the participant-observer is one in which the researcher interacts with participants in their environment and observes participants to understand their interactions and behavior (Mack, Woodsong, MacQueen, Guest, & Namey, 2005). Here, the researcher acted as content expert in the sex-related topics that were presented. She observed the interactions that occurred within the *Facebook* group, but also participated through answering questions and providing specific information, links, and resources.

The researcher has had several semesters of experience with managing a *Facebook* group for the coordination of students enrolled in three laboratory sections of an undergraduate course at the university. The *Facebook* group was created for the purpose of helping students to stay in touch with the graduate and undergraduate teaching assistants, ask questions, share resources, and vent their frustrations. In this case, the researcher was not formally collecting data, but adopted the role of a mentor and content expert for students across the lab sections. Some of the strategies that the researcher had used were appropriated for use in the current study. For example, the researcher responded to all *Facebook* notifications from the group page within a few hours of the original post (with the intent of encouraging students to use the *Facebook* page as a resource for question and answer sessions). She was also consciously involved in monitoring

content for inaccuracies and inappropriate material, and providing encouragement when students expressed frustrations with the material. In the event that students posted inaccurate information, the researcher would take the initiative to guide students back to the correct answer, and provide the rationale for doing so. The current study placed the researcher in a similar position to that which she has adopted in the past with the lab students. Therefore, she paid specific attention to maintaining frequent monitoring of the *Facebook* page to ensure her responsiveness to student inquiries and discussion during data collection.

To ensure that the researcher was providing appropriate resources and information, she had the opportunity to consult with staff at Schiffert Health Center responsible for conducting and supervising the sexual health workshops on campus. Some of the materials from this consultation were included during the course of the study. Other resources included pages and articles from websites such as Planned Parenthood, the American Sexual Health Association, and pre-screened videos from *YouTube*. As a previous graduate teaching assistant for an Animal Science based Physiology of Reproduction course, the researcher also drew on prior knowledge and lecture materials for relevant information.

Instruments

Quantitative data collection consisted of self-report survey data from surveys administered to participants online. All surveys were administered using the *Qualtrics* survey system. The purpose of including self-report data in this study was to be able to compare survey response results with the rich qualitative data obtained from social media and focus group sessions. Some of the primary concerns with self-report data include the establishment of reliability and validity (Brener, Billy, & Grady, 2003). Items to be included in this survey were developed by the researcher and aligned with the research questions. *T*-test analysis was

performed for each item in order to determine differences between pre- and post-study survey data. The Cronbach's alpha test for reliability was calculated to be 0.28 for pre-study survey items. Cronbach's alpha for the questions specific to the post-study survey was calculated to be 0.88. Cronbach's alpha was calculated separately for these items in order to determine the reliability of items created to assess different factors. For example, pre-study survey questions assessed student attitudes about using social media in educational settings. The questions added to the post-study survey were meant to assess student attitudes about the Learning for Health study specifically.

Participants were surveyed prior to the start of the social media phase of the study and immediately after the end of the social media phase. The pre-study survey included questions on demographics, and behaviors and attitudes surrounding social media for personal and educational use. The demographic information included participant age, race/ethnicity, sex, year in college, and major(s). The second section of the survey incorporated questions about social media usage and attitudes towards social media usage. A full listing of items included in the pre-study survey can be found in Appendix A.

The post-study survey was only sent to the 17 participants who had completed the social media phase of the study. Two reminder emails were sent in addition to the original email encouraging participants to complete the survey. This email also included information about signing up to participate in the focus group portion of the study. The post study survey was adjusted slightly based on findings from the social media phase. For example, questions specifically related to the *Facebook* study page were added such as, *How often would you say that you checked the Learning for Health Facebook page during the study period?* A listing of the items included in the post-study survey can be found in Appendix B.

A final survey, sent out alongside the post-study survey, was intended to collect information from students who wished to participate in focus groups. This survey included items asking only for student name, contact information, and availability during the week, and was separate from the post-study survey. Thus, student involvement with the focus group was not connected to their survey data. Students also had the option to contact the researcher directly for more information on participating in the focus group. A total of four students indicated interest in participating in the focus group phase.

Procedures

The current study adopted a sequential exploratory mixed methods approach as described by Creswell (2009). In this approach, quantitative data are utilized to support the interpretation of qualitative data. Both data types are collected in distinct phases. The first phase of the study included the recruitment and pre-study survey phase, during which participants were invited to participate, completed the pre-study survey, and joined the Learning for Health *Facebook* page. This phase resulted in the first instance of quantitative data collection.

The second phase of the study was the social media phase, which resulted in the first period of qualitative data collection. In this phase, participants were encouraged to engage in interactions with information presented through the Learning for Health *Facebook* group page. This phase took seven weeks to complete, with each week focusing on a different topic area. The topic areas covered were: reproductive anatomy of the male, reproductive anatomy of the female, functions and types of birth control, fertility and conception, STIs, healthy sexual relationships, and participants' choice. The first six topics were reflective of the major types of misconceptions identified for young adults and teenagers by Wynn, Foster, and Trussell (2009) and Cohn and Richters (2013). The last topic area was meant to allow participants to submit topics that they

were specifically interested in. Throughout the study period, a link to an anonymous survey was available for students to submit questions that they did not feel comfortable posting about on the page. These questions were answered within 24 hours on the *Facebook* page. Examples of social media posts created by the researcher for each topic can be found in Appendix D. The researcher drew from past experiences, using *Facebook* as a supplemental page for Reproductive Physiology students. Topics by week were listed and available to students ahead of time. The tone of the posts was meant to be informative, but open to discussion. Posts varied from text-only posts, to polls, to posts linking external resources such as medical diagrams and videos. Many posts also included discussion questions meant to prompt students to share ideas. Humor was occasionally used in an attempt to engage student interest and encourage discussion.

The third phase of the study included the post-study survey and invitation to participate in focus groups. Here, the second round of quantitative data was collected. The fourth and final phase of the study consisted of one focus group session. The session was an hour and a half in length and included four participants. The purpose of focus group interviewing is to encourage the discussion of specific topics using directed questions about the topic (Rossman & Rallis, 2012). Focus group sessions are useful in allowing participants to articulate and discuss ideas and perceptions that may not be as accessible through one-on-one interviewing. They have been described as particularly appropriate as a method for exploring attitudes and experiences, which relates well to the proposed research questions regarding the experience of sex education through social media (Kitzinger, 1995).

Due to the small number of participants who had completed the social media phase, only four students indicated interest in participating in the focus group phase. Prior to the interview session, the researcher organized an orientation meeting lasting 15-20 minutes during which

participants had opportunity to meet one another and the researcher. Due to scheduling constraints, three of the focus group members attended one orientation meeting, and the researcher met with the fourth member separately in a second orientation meeting. During the orientation meetings, the researcher worked to establish rapport with the participants and discussed the nature of the focus group interview and project. The interviewing process was explained, and a paper version of informed consent for participation in the interview was collected from all participants. The informed consent form was reviewed thoroughly prior to signing. A copy of the informed consent form was given to each participant. Finally, a date for the actual focus group was determined with the agreement of all participants.

The focus group was approximately an hour and a half long, and conducted on campus in the evening hours based on participant availability. The interview followed a semi-structured format, using the interview guide approach. Using this approach, the researcher came prepared with a list of 10-15 open-ended questions to guide discussion. Semi-structured interviews allow for the flow of discussion to proceed based upon the ideas of the participants. While the researcher provided questions and prompts to guide discussion, participants were able to provide their own unique perspectives, bringing up topics that were also be relevant to the topic (Rossman & Rallis, 2012). The complete final interview guide can be found in Appendix C. At the end of the fourth phase, qualitative data collection was completed. A timeline outlining the events of each phase of the study can be found in Table 1:

Table 1

Final timeline of events for study

Study Phase and Dates	Study Events and Procedures
Phase I: Aug 25, 2014 – Sept. 5, 2014	Recruitment of study participants through email and class visitation/announcement

	<p>Contacted participants electronically for informed consent</p> <p>Data collection: Pre-study survey</p> <p>Participants joined group <i>Facebook</i> page</p>
Phase II: Sept. 7, 2014 – Oct. 25, 2014	<p>Social media phase/data collection:</p> <ol style="list-style-type: none"> 1. Week 1: Reproductive anatomy of the male 2. Week 2: Reproductive anatomy of the female 3. Week 3: Functions/types of birth control 4. Week 4: Fertility and conception 5. Week 5: Sexually transmitted infections (STIs) 6. Week 6: Healthy sexual relationships 7. Week 7: Participants' choice
Phase III: Oct. 25, 2014 – Nov. 6, 2014	<p>Data collection: Contacted participants electronically to complete the post-study survey</p> <p>Invitation to participate in focus groups</p>
Phase IV: Nov. 9, 2014 – Nov. 22, 2014	<p>Data collection: Orientation interviews conducted</p> <p>Focus group conducted</p>

Data Analysis

The qualitative data analysis utilized discursive psychology as a guide, and connected learning as a framework with which to describe the analysis. Discursive psychology, as described by Roth (2008), describes language as situational, action-oriented, and constructive. Thus, language is created for the purpose of conveying meaning in a particular environment, and is driven to achieve a certain end. The current study explored how participants utilized language in various forms to convey their experiences with social media as an educational tool, and their participation patterns during the study period.

Thematic coding is an iterative method of data analysis involving a series of steps to identify major themes associated with text-based data. Each code is representative of major themes, and can be used to signify that an excerpt from the text has meaning. Steps include (a) the development of a coding manual or codebook, (b) testing the reliability of codes, (c) summarizing data and identifying major themes, (d) applying the coding template and continuing coding of the data, (e) connecting codes and identification of themes, and (f) legitimating coding themes (Fereday & Muir-Cochrane, 2006).

The development of the qualitative codebook for the study began with verbatim transcription of the focus group audio recording. Following transcription, the researcher conducted a first pass through the data, making notes and identifying areas of the transcript that may have particular importance to the research questions. Using this method, the development of the codebook was more closely grounded in the data set. The importance of themes as emergent from the data has been emphasized by Charmaz (2014). During this process, the researcher also created a series of memos to serve as documentation for the analysis of data. Memos can be defined as journal-like entries that the researcher uses to describe ideas, feelings, and changes associated with the data analysis (Corbin & Strauss, 2008). They are an important way for qualitative researchers to maintain reflexivity, constantly comparing their new ideas to their old ideas. Continuously writing memos throughout the data analysis was also important in accounting for the researcher's interpretation. This was particularly important due to her role of participant-observer, which requires higher involvement with the study participants.

Following the first pass through the data set, notes and ideas were used to create the first version of the codebook. Codes can be defined as concise labels that identify meaningful excerpts within a qualitative data set (Corbin & Strauss, 2008). Codes can then be organized into

categories, which include codes that are similar or related in some fashion. The codebook used for the study included specific definitions and examples for each code to provide a reference for categorizing text excerpts. Using the codebook, the researcher conducted a second pass through the data set to test the applicability and relevance of the codes. Due to the iterative nature of qualitative research, the researcher continued to create new memos and to adjust the codebook when new ideas related to the research questions emerged. The aim was to achieve theoretical saturation at which point no new ideas pertinent to the research questions were found. Passes through the data were repeated until theoretical saturation was achieved, and all changes to the first codebook were documented. The complete codebook used for the study can be found in Appendix E.

The primary data source for the current study was intended to be posts to the group *Facebook* feed. However, data in the form of posts to the *Facebook* group page were sparse throughout the study period. To investigate the ways that participants interacted with the *Facebook* page, participant viewing and “liking” of content was tracked over time. “Liking” is a feature available on *Facebook* that allows users to express their appreciation for a particular post or resource. Participation in polls was also tracked over the course of the study. Several questions were also submitted to the anonymous *Facebook* survey, and were also tracked over time.

Group pages that are set up through *Facebook* include a news feed that group members can interact with through the creation of posts. The news feed is arranged chronologically by most recent post, which appears at the top of the newsfeed. If a group member creates a comment that is associated with an older post, the original post is pushed to the top of the newsfeed. Posts that group members create can take the form of text only, or may include links

to other websites, videos, or photos. Group members may also upload files and create and respond to polls. Throughout the study, participants were encouraged to explore links, answer polls, ask questions, and discuss major topics prompted by one another and the researcher.

The focus group interview provided a crucial second source of qualitative data as it allowed the researcher to discuss specifics related to social media usage within the context of the study as well as more general attitudes that students had towards social media use for recreation and education. Thematic coding was utilized as a way to analyze interview transcripts from the focus group interviews. All participant names and identifying information have been removed for the purposes of confidentiality. The final codebook was developed and adjusted iteratively to identify major ideas that emerged from the interviews. Consistent with the thematic coding process of Fereday and Muir-Cochrane (2006), interview transcripts were examined multiple times to ensure that all major themes were captured and represented during the coding process. All qualitative coding and analysis was conducted using Microsoft Word.

To account for potential researcher bias while coding *Facebook* and interview data, the researcher created memos, and collected them in a reflexivity journal to document reactions, insights, and ideas that she has during the coding process. Assessing reflexivity has been identified as a way for researchers to provide insight into the factors that may influence their interpretation and analysis (Krefting, 1991). The aim of the qualitative researcher is to analyze data while recognizing the effects that culture and personal experiences may have upon the analysis. Thus, thematic coding requires proper documentation of feelings and reactions for other researchers to refer to. This provides a trail for others to better understand the researcher's interpretation of the data. Reflexivity journals push the researcher to be self-critical and to rationalize decisions made during data analysis (Rolfe, 2006).

The third type of data collected was the self-reported pre-study and post-study survey data of participant demographics and social media behaviors and attitudes. These data were analyzed quantitatively to provide support for any changes reported in social media behaviors and attitudes within the survey sample. Graphics were created to show the distribution of student responses – for example, the types of social media websites that students had profiles on. *T*-test statistical analyses were focused on determining whether social media behaviors and attitudes for the small sample population changed at the completion of the social media phase. An alpha level of .05 was used for all statistical tests. All statistical analyses were completed using Microsoft Excel software following the completion of the data collection.

Data from the *Facebook* feed, focus group interviews, and surveys were compared and triangulated to generate assertions regarding the research questions developed for this study. Triangulation of data is a cross-validation method involving the examination of multiple types of data to ensure that themes and results remain consistent (Jick, 1979). When multiple data forms are collected using independent methods, but still show the same results, it provides greater confidence in the accuracy of those results. This occurs because confirmation of assertions comes from multiple data sets, which can minimize any biases or distortions of any of the data sets independently (Krefting, 1991). For the purposes of this study, results from the analyses of three different types of data will be compared.

Approval and Data Security for Study

All procedures were approved by the Institutional Review Board (IRB) at the researcher's university. The researcher completed the necessary IRB training for the protection of human subjects. Data was stored on the personal computer used by the researcher for data collection. The computer was password protected in order to ensure that all data was secured. The *Facebook*

group created for the study was set to run as a “secret” group, ensuring that only the researcher and participants who have provided informed consent were permitted to find and view the group, and only members had access to content.

Summary

The current study utilized a mixed methods approach in order to explore the undergraduate experience of sex education through social media. Creswell’s (2009) sequential exploratory strategy for mixed methods was used, with qualitative and quantitative data collection taking place at separate time points. The use of mixed methods has allowed the researcher to triangulate multiple self-report data sources, resulting in the ability to generate stronger assertions about major themes associated with the research questions. Primary data was meant to consist of posts created through the social networking website, *Facebook*. However, due to sparse interactions by participants through *Facebook*, the focus group data became an important data source. Social media and focus group data were compared for major themes using a framework of connected learning (Ito et al., 2013), and the iterative process of thematic coding as described by Fereday and Muir-Cochrane (2006). Quantitative data was utilized as a secondary data source to provide support for themes emerging from the primary base of qualitative data, and to assess whether change had occurred in learner behaviors and attitudes associated with social media as educational tools.

Chapter IV: Results

In this chapter, the findings from the current study will be discussed in order of the research questions. Results from both the quantitative study data and the qualitative data will be blended within each section to present a more complete picture of the data associated with each research question.

Research Question 1: Does the use of *Facebook* as an educational tool support connected learning as indirectly measured by the associated factors of:

- a. Open and positive attitudes towards blending recreational and academic social media usage,**
- b. Involvement with social media for the purpose of learning or participating in academics, and**
- c. Evidence of community interaction?**

Students did not utilize the Learning for Health *Facebook* page in the manner originally anticipated during the proposal phase. While the researcher had intended for the page to provide an open environment for students to converse, ask questions, and discuss sexual health topics, students rarely chose to contribute directly to the group in the form of posts, answering polls, or “likes.” Due to the lack of participation during the study period, the post-study survey was adjusted to ask a few questions regarding student participation. For example, a question was added to assess how often students accessed the Learning for Health page each week. The full listing of questions included in the post-study survey can be found in Appendix B. In addition to the adjustments made to the post-study survey, the researcher also included some probing questions about the factors affecting participation during the focus group. For example, the researcher asked how participants approached information on the Learning for Health page as

well as what drove participants to participate or not participate through posting. A list of the interview questions and probes used for the focus group can be found in Appendix C.

Participants in this study indicated that they were open to blending their social media usage for recreational and academic purposes. A major overarching theme that was consistent throughout the focus group and survey responses was the idea of *balance and blend*. This idea was developed in order to capture the idea that connected learning involves the ability to balance peer culture, learner interests, and academics as separate entities in addition to allowing the three to become integrated with one another. The following reflexive memo was written during focus group data analysis in order to capture and develop the idea of *balance and blend*:

Memo 14: Connected Learning as a Balancing Act - Participants all seemed to agree that social media, peer interactions, and academic experiences played roles in their lives. Balance was something that was brought up a few different times during this discussion. Specifically, participants felt that, because the three each played a strong role, they needed to balance the needs of each individually. This leads me to believe that, while the three are blended, individual attention to all three needs to happen as well. Perhaps in reality there are six different dimensions to connected learning – social media (interests), peer culture, academic experiences, social media (interests) X peer culture, social media (interests) X academic experiences, and academic experiences X peer culture. Attention should be paid to the crossovers between all parts of the trio as well as the individual areas.

When students are able to balance and blend their experiences, there may be increased opportunities for learning to occur. One of the ways that this study examined the idea of *balance and blend* was to measure the openness of students towards allowing crossovers between their recreational social media use and their academic social media use. In order to explore this, the reasons that students accessed social media were first identified via the pre-study survey. These responses were consistent with the literature in which students primarily use social media to engage in social interactions for recreation. Figure 1 shows the pre-study responses.



Figure 1. Reasons for accessing social media. This figure shows the reasons that participants identified for accessing social media.

Consistent with literature reporting that students use social media predominantly for recreational purposes, the two most popular reasons for accessing social media were to maintain relationships with friends and to post pictures, a form of visual media. Still, it is interesting to note that another fairly common response was to keep in touch with classmates and instructors. This indicates that social media are already being used by this particular sample for academic purposes, and provides some evidence for student involvement with social media for learning. This is consistent with the framework of connected learning in which social media, as popular recreational technologies, may be utilized for academic purposes as well. Students in the study appear to be balancing and blending social media usage for recreation and academics. This is also consistent with results indicating that students disagreed with the statement that social media were only for recreation, an attitude consistent between pre and post-study data as measured by *t*-test ($p = 1.00$).

Data from the pre- and post-survey indicated that participants were open to using social media for academic purposes despite their lack of direct participation during the study period. A *t*-test was conducted to determine whether there were any observable differences between student responses at the start of the study and after the social media portion of the study. All students strongly agreed, or somewhat agreed that social media could be used for educational purposes, with no statistically significant differences between the pre- and post-survey responses ($p = 0.40$). However, students also somewhat agreed that they would be more comfortable with some social media sites over others in an educational setting. No statistically significant differences were found between the pre and post-survey responses ($p = 0.76$). From these survey results, it appears that students in the current study sample were open to blending social media into their educational experiences, but that the social media site that was used might be of some importance.

Two findings regarding student attitudes were found to change between the pre- and post-surveys. The first was agreement with the statement that, *I would like to see professors use social media as part of their courses*. For this statement, students were more likely to indicate that they strongly or somewhat agreed in the pre-survey compared to the post-survey ($p = 0.01$). In the second finding, students were asked whether they would feel uncomfortable having to access social media such as *Facebook* for a course. Students were more likely to indicate agreement with this statement in the post-study survey when compared with their responses from the pre-study survey ($p = 0.02$). These responses were particularly interesting when considering that students were all in agreement about social media having a place in educational settings. However, due to the small sample size available for comparison (only 11 students completed both the pre and post-study survey), these results should be interpreted with caution.

The openness of students towards social media use was further explored during the focus group. Students discussed a number of different ideas in support of using social media for academics. These ideas were translated into focused codes including: familiarity with social media, informal learning via social media resources, preference for *Facebook* (as compared to other social media sites such as *Twitter*), and openness to social media integration into courses. Figure 2 displays the frequencies for each of the four ideas throughout the focus group.

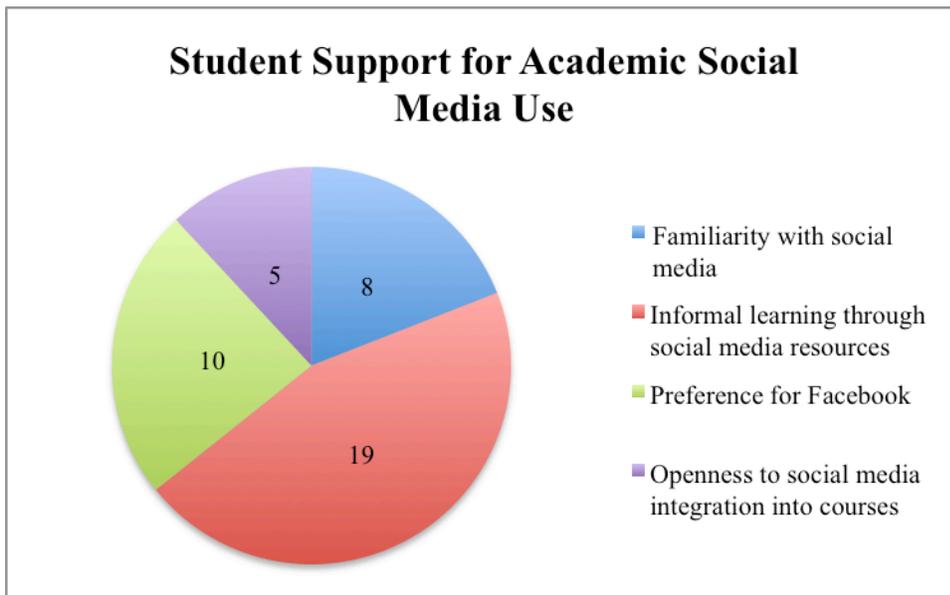


Figure 2. Student support for academic social media use. This figure shows the frequencies for each of the focused codes supporting academic social media use.

The focused code for familiarity with social media was assigned to excerpts of the focus group transcript in which students discussed social media technologies and the navigation of social media as familiar and easy to use. Examples include the following statements by two different students:

“I think teachers know by now like everyone’s just really into like social media and just always on it so it’s like, why not use this in my class since they’re probably already on it anyways in my class?”

“Yeah like everyone already has the profile set up, they already know how to use it versus forcing people to learn a new site you know, like it takes a while to get used to how a different site would be run so if they’re already on *Facebook*, and know how to use it well, it’s more efficient to just post something there for people to look at.”

In these excerpts, students discuss the idea that social media such as *Facebook* are already used by large numbers of undergraduates. The familiarity that these students have with social media, consistent with current literature, may serve as a benefit. Specifically, the idea that students are “always on” social media, and that they “already know how to use it” provides support to the idea of *balance and blend*, which allows for the integration of technologies popular within peer culture into academic settings.

An idea that was prominent throughout the focus group was the idea of informal learning via social media resources. The *Facebook* website not only includes the ability to post links to external websites and articles, but provides links to current stories in the news. These stories take the form of a sidebar called “trending” in which the most popular stories are available for exploring. Students frequently talked about being able to look up news stories or learn about current events through *Facebook*. They described the trending feature, and also other methods of obtaining information such as through joining *Facebook* groups related to interest. In the following excerpts, one student talks about enjoying the trending feature, and another discusses how interacting through *Facebook* kept her updated on a search for a missing person at a neighboring university.

“Yeah I like *Facebook*’s um, well cause it has all of that stuff that you can do with your friends and family but like if you have five minutes in between class, I like that they have news, current news now too. So, instead of having to get onto Google and try to find something about current news, like they list the current news as well so, it just seems relevant to a lot of what’s going on.”

“I feel like with the Hannah Graham thing, that was really helpful because that was something that, like we really wanted to stay connected with but weren’t really close to.

And so, so I, on *Facebook* like it was a lot of people sharing that information so I was able to see a lot.”

From a *balance and blend* standpoint, the use of *Facebook* for reading about the news is a blend of student interest in current events and peer culture. While current news may or may not have anything to do with current coursework specifically, the ability to include links to external resources may serve as a method for instructors to provide supplementary materials to students.

Despite a lack of observed participation on the Learning for Health *Facebook* page, the students in the focus group often expressed a preference for *Facebook* as the social media of choice for academic usage. One participant states:

“I interact more on *Facebook*. Like I have a *Twitter* and I don’t, I can’t remember the last time I checked that. Like, it’s just something that, I use it to like look at what other people, like what everybody’s saying, but most of the time it’s not worth my time but I interact more like, I feel like *Twitter*’s more just like you’re either into it or you’re not but on *Facebook* you know, most people like agree with it and like use it.”

Other participants discussed how *Facebook* seemed to provide a good mix of features compared with other social media sites. Students in the focus group did not seem to enjoy using *Twitter*, saying that it contained too many quotes that were not relevant to significant life events. They also suggested that it was less “friendly” than *Facebook* with more inappropriate comments. While they did mention the social media website *Instagram*, they didn’t feel that it would be the best choice since the site focuses mainly on pictures. Thus, the ability to have multiple features in one place came up as a definite advantage of the *Facebook* website. The ability to post pictures and also communicate through chat was discussed in the following excerpt as an advantage of *Facebook* use:

“That’s kinda the reason I like *Facebook* it’s you get like, a mix of those two [in reference to *Twitter* and *Instagram*]. Like you’ll see peoples’ pictures and you’ll see what they’re talking about and then you can talk to them. It’s just kinda, it’s easy, like, videos on there too I really like it.”

In some instances, students were also observed to specifically indicate a positive stance towards using social media for education. In the following excerpt, one student expresses that she does not think the integration of social media would be difficult or intrusive:

“Like, education’s a part of your life too and like at this point, like I feel like education does like invade into your normal, like your recreational life like already. So I feel like that would just be like more convenient, like I feel like it’s already invading it so I feel like the social media aspect, adding that into it’s not making that big of a difference.”

This excerpt is particularly consistent with the idea of *balance and blend* in that the student makes direct reference to the crossover between academic and recreational life. She explains that she already sees how academics become ingrained into daily life, and that adding social media into the mix would not be difficult. The same student later goes on to say that she sees the potential of social media for education, but has also observed that social media are often used ineffectively in classroom settings:

“I feel like the academic side’s not very like, it’s not as strong a connection at all like most of the, like it’s [reference to social media] not really used for academic purposes right now. Like I feel like it could be and it should but like it, the social media keeps me connected to my peers but I feel like it could keep me connected to my academic life if they used it correctly or they like tried to implement it.”

Here, the student emphasizes that social media are uncommon in courses that she is currently taking, but that she sees the value of including it and feels that there should be more integration. This is again consistent with the idea of *balance and blend* in which recreational social media use may be integrated with academic social media use. Still, it should also be taken into account that blending comes with challenges. The student has indicated that from her experiences, she feels social media are more often used ineffectively for academic purposes. Thus, while student openness to blending increases the opportunity for connected learning to occur, attention must be paid to the manner in which educational information is presented, and to creating meaningful educational interactions.

In order to improve upon social media integration into educational settings, a number of codes were developed in order to capture recommendations that instructors might use for effectively integrating social media into courses. Students were willing to discuss many of the factors that they found beneficial when considering social media for the classroom. Examples included the use of visual media, the responsiveness of instructors and TAs, the presence of filtering or monitoring, and the ability for the instructor to convey personality. The frequencies at which these factors were mentioned during the focus group are displayed in Figure 3.

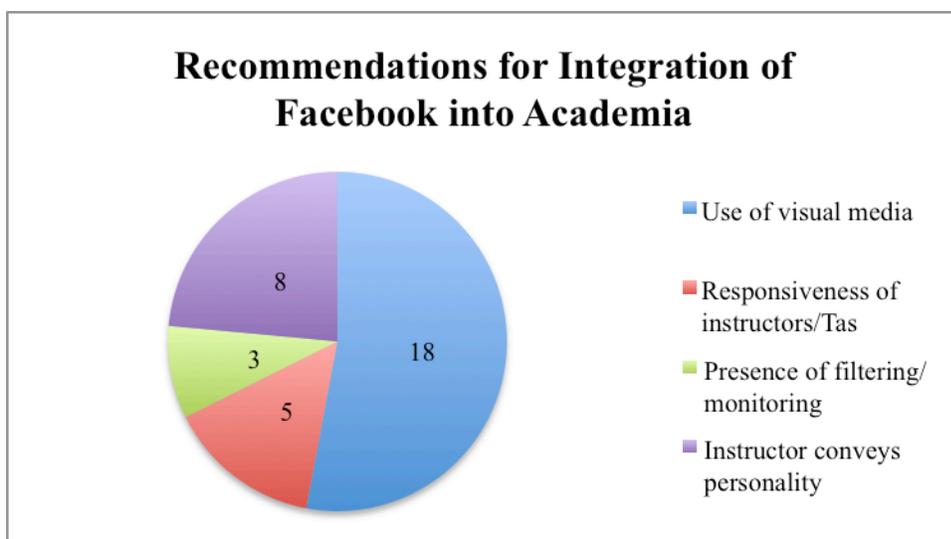


Figure 3. Recommendations for integration of *Facebook* into academia. This figure shows the instances in which students discussed ideas that could be used to improve the integration of *Facebook* into educational settings.

Most all of the ideas that students proposed for social media integration were related to the development of relationships and community. This was in alignment with literature saying that undergraduates use social media primarily to keep in touch with others. From a connected learning standpoint, the development of relationships through social media need not be limited to peers and family, but may also occur with instructors and peers that are taking the same courses. There were a few different ways that undergraduates mentioned for keeping in touch and

establishing community. One example was the use of visual media such as photographs and videos. Students specifically mentioned that they enjoyed being able to look at pictures and videos that people posted on their *Facebook* pages. One student stated:

“That’s kinda the reason I like *Facebook* it’s you get like, a mix of those two [referring to *Instagram* and *Twitter*]. Like you’ll see peoples’ pictures and you’ll see what they’re talking about and then you can talk to them. It’s just kinda, it’s easy, like, videos on there too I really like it.”

In this statement, the student links the availability of visual media through *Facebook* to enhanced connections to people that they interact with. They mention that they can look through pictures and also talk to their friends about the pictures that they view. The use of visual media may therefore increase feelings of connectedness among social media users. From a connected learning perspective, the interests that students have in particular topics may lead them to view particular materials that are available to them through social media. This can then lead to further exploration of materials via interactions with peers and more knowledgeable others. Interactions may then contribute to the formation of learning communities in which ideas may be shared and expanded upon. A reflexive memo written during the focus group analysis captures the development of this idea:

Memo 13: Social Media to Supplement the Text - Learning can be both individual and social, and participants mentioned an appreciation for both. Participants mentioned that they normally like to learn things on their own before going to look at diagrams, videos, and other visual media as a reinforcement strategy. Social study with peers is also something that was talked about as a reinforcer for knowledge already acquired. Social media may effectively provide a supplement to lectures and textbooks through providing plenty of visual examples and outside resources in one place. It can also serve as a forum for group discussion and question/answer sessions after individual students have explored course materials on their own. The focus of a social media site might be best as a collection of visual media – which would also require shorter posts within the word limit that students have for interacting.

When considering this memo, it is also important to note that social media may serve best as supplements to formal educational experiences such as college courses. This particular study used *Facebook* as the primary method of providing information to students on sex-related topics. However, social media may be better utilized as a less formal way for students to interact with course related materials. The following memo was written to capture the idea that balance must exist when using social media for education. The integration of social media should provide something meaningful to the student beyond simple announcements for a course:

Memo 7: Social Media as Supplementary - I feel like this idea will be very important for instructors who wish to effectively incorporate social media into their courses. The idea here is that social media should not be the basis for the entire course, but rather a supplement to face-to-face lecture style classes. This study adopted a different type of approach since information was presented in sequence by week. Many of the examples that the participants mentioned in regards to social media in the classroom involved professors using social media for announcements rather than a way to present material. However, there needs to be a balance – social media needs to provide something extra to the student that is seen as meaningful. There needs to be responsiveness of the organizer so that students feel that they can engage in meaningful interactions.

Within the context of the study, visual media were also seen as particularly positive.

Students were asked what types of posts they enjoyed most throughout the course of the study.

The following are examples in which students make reference to visual elements included in the *Facebook* posts:

“Like the interactive videos like, in general I feel like those like, drew my attention cause I was like, it’s more than just reading the information it’s actually a way to process the information. So I feel like interactive or like animated posts were more like, I was more interested in those.”

“I think [the study] was pretty fun. There’s a lot of stuff that you don’t normally think about and, you know you wouldn’t even know to look it up so it was kind of interesting that it was all presented there and um, the videos were kind of enjoyable. I dunno. I liked it.”

From these excerpts, it seems as if the inclusion of visual elements such as diagrams and videos would be well received if included in social media efforts for education. This could

potentially appeal to a wider variety of students and encourage views or other forms of participation. A second point that students often mentioned was the idea of responsiveness on the part of the instructor and teaching assistants. Students made several statements indicating that they valued timely feedback and the ability to communicate frequently and efficiently with people in charge of a course. One student provided a great example of this idea:

“Yeah I think having people managing the site that are knowledgeable either TAs or the professors and be very responsive so someone asks a question, they get an answer to it in a good amount of time cause if it, you know if you ask a question about your homework tonight that’s due in a couple days and nobody gets back to you then it loses its value cause you can’t actually use it while you’re working so, I think responsiveness with people running it.”

The responsiveness of instructors and TAs has the potential to contribute a great deal to feelings of community in an educational setting. Responding frequently and in a timely fashion may create an environment in which students feel that they may have open communication through the social media site. However, while students do want the ability to communicate efficiently through social media, they also indicated a desire for a filtering or monitoring system. Filtering and monitoring were discussed as a way to ensure that the environment remained educational and that comments were appropriate. This was particularly true within the context of the study due to the topic of sexual health. Students stated:

“Yeah I think maybe that would be good for not just sexual topics but topics maybe supposed to be specifically educational cause it would quickly get filled up with people making comments maybe who may not be informed about the topic, and then confusing everybody else with the comments of ‘this isn’t true’ you’d get into large arguments about this or that. So if it’s an educational group I like the idea of it being, you can search the headline, administer adds you, and then you may or may not be able to post certain things but you can be there to you know, view what’s being showed by people who are informed about the topic.”

“I feel like it would be, like the, the title or the name of the group should be public but I feel that if they’re interested in the topics then they should at least be able to join the group for just, just for a little while to see what it was about. Because I feel like otherwise, like there has to be some sort of filter.”

Statements such as these indicate that students appreciate a safe and positive learning environment when they are considering social media for education. This may be particularly true when material could be considered sensitive - for example, this study which provided information on sex-related topics. In the excerpts above, students mentioned that arguments through social media occur when people are able to make comments without monitoring. This potential for inappropriate commentary through social media will be discussed later on in this section as a challenge to community formation and social media integration into education.

A final recommendation that became prominent in the analysis was the idea that instructors should convey their personality. Students made several statements indicating that they appreciated an instructor's ability to include humor or personal stories as they taught. This may be even more important when considering the integration of social media into courses since instructors may have a harder time connecting with their students over the internet. When asked about the qualities that they looked for in an instructor, students stated:

“They would be approachable. Like there wouldn't be like, I feel like some professors kind of feel like they're way above you and like, so I feel like they need to be approachable and then like also like be able to communicate well? And then actually explain the material more than just like read it off of a powerpoint slide. So they could actually like explain it and have personal experiences to explain it and make it further like to help you identify with the information then also be able to like you feel comfortable asking questions and you feel comfortable like approaching them for like further advice.”

“There's actually one thing I really like is when, is when one of them will, you can just tell that they're really excited about the material and like they just love their jobs? So, it's like 'Oh yes, my absolute favorite thing are you ready?' kind of thing and you can just like, they don't necessarily say that but you can just kinda hear it in their voice that they're, 'Isn't this great?' And even if, so like even if I'm not particularly like excited about that material I will get more excited just because of being around them. This is actually pretty cool. And I can get interested in it. And if helps me learn better when it's interesting.”

Considering the high value that students appear to place on approachability and personality, it is important for instructors to take into account that their social media presence may play a strong role in the student learning experience.

There was very little evidence for the formation of a learning community during the study period. As previously mentioned, students only rarely created posts on the Learning for Health page, resulting in sparse evidence for collaboration and discussion. Students chose to submit questions exclusively through the anonymous survey, which meant that other students would not know who had asked the question. The lack of community formation on the Learning for Health page led to the addition of several questions regarding participation on the post-study survey, and probing questions related to participation during the focus group. Special attention was also given to identifying potential challenges that may have impeded the establishment of a learning community through *Facebook*. The lack of participation in this study of educational social media use indicates that there are challenges that should be recognized with any attempts to more effectively integrate social media into educational settings. While it may seem as if connected learning may occur on its own through the simple incorporation of social media into an educational experience, the results of the study show that this is not the case. Rather, there are a variety of factors that may impact the ability for educational experiences through social media to be successful. Challenges that were identified during the focus interview were coded, and are displayed in Figure 4.

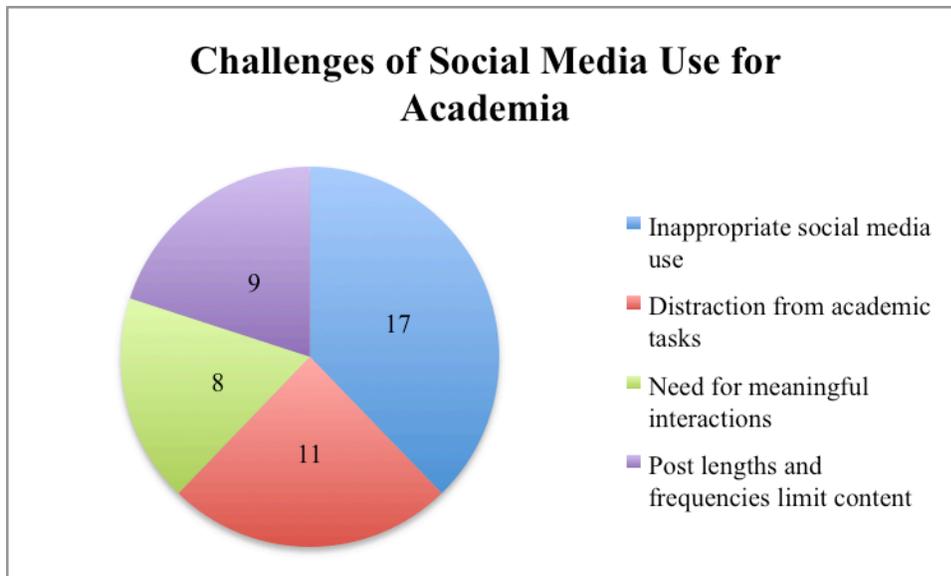


Figure 4. Challenges of social media use for academia. This figure illustrates the incidences in which students discussed potential pitfalls of social media use.

The most common challenge associated with social media was the idea of inappropriate social media use by others. This was discussed both directly and indirectly during the focus group. Inappropriate social media use was described predominantly as posting negative comments meant to put down others. In the following excerpt, a student describes inappropriate social media use by people that she knows from her hometown:

“In my hometown it’s really, there’s only like 1000 people in there, it’s like a really small town? And so, like I pretty much well, I mean like, I’m friends with everybody who’re like, in, like, the area? Like in our county I’m like, they’re on *Facebook* somewhere. And so a lot of people in our area aren’t the best? Like, they use it for like passive aggressive comments or they use it... I, just to be horrible to other people. And so like I’ve seen them like they’ll post something, um, these are people that like generally aren’t doing much with their life? It’s they use that as their only way of like, to like that’s what they live for is to get on *Facebook* and like post something like horrible about somebody. So like sometimes you’ll scroll through it and they’re like, tagging people in a status and like it’s a horrible status and it’s just their way of like, fighting it out but instead of being like, in person? But then eventually someone gets on there and is like, ‘You all are being ridiculous.’ And so then they like stop and they realize what they’re doing and they like delete the comments and stuff? Like in general that’s something like I see a lot just because of our area I think more than anything. More of that’s their way of turning to instead of actually like confronting people. And because they have nothing better to do with their time than cause internet drama.”

Students seemed to feel that inappropriate comments were inevitable when interacting with a large group of people through social media. However, they also pointed out that they did not believe that the inappropriate use of social media was a con associated with the technology specifically. Instead, they emphasized that inappropriate social media use was more of a personal problem on the part of the user. The following excerpts illustrate this point:

“Then I feel like people using it for the wrong reasons, like to be, like horrible to other people. I feel like there, I don’t think that’s necessarily a social media problem. I feel like that’s like just the way they were, like, that’s their problem. Personal problem. Like I feel like social media makes it easier for them to like bully others, but, but then again I feel like social media shouldn’t be the blame for that. It should be like their own like...”

“Yeah like I don’t think I’ve had anything terrible happen on social media like some of the groups I’m a part of, um, you know if it’s like a hobby like reptiles or something, you know someone will post a picture on the group and say, ‘Oh, can you identify this reptile?’ And then like, it’s 90 comments deep and half of it is making fun of the person for not knowing what it was in the first place but I feel like those people are like that in person too, you know I think people are just arrogant sometimes and it comes through in social media but again, they’re like that in person so I don’t think it’s necessarily social media’s fault for that.”

“Really it was, if it [referring to a sexual health group] was just on *Facebook*, like not a group and like you just posted things on *Facebook* like, there’d be like stupid people with ignorant comments and something bad so like, I’m glad it was like educational purpose cause I feel like if it was just out there, there would have just been people who thought it was funny or like making fun of something like that not, not educational.”

This challenge relates to the recommendation that students had for filtering and monitoring on the part of the instructor. While students acknowledge that there will be inappropriate comments when information is public, they also believe that this is not something that should be used against social media as a technology. Rather, they attribute the negativity to the actions of individuals – something that filtering and monitoring may serve to assist with. The following memo describes the development of this interesting phenomenon:

Memo 3: Defending Social Media - The participants had some interesting views on the negative aspects of social media. Specifically, they did not view negativity on social

media as a problem associated with social media itself, but rather a problem with people that are negative by nature. The issue of cyberbullying was presented, but there was not much discussion about cyberbullying as a major issue. This was surprising to me since I know there is a lot in the media about cyberbullying, and that it is a big concern when using social media in classrooms already. Instead, participants talked about how some people will put others down for no reason, but that those people are probably negative people in real life. For example, one participant talked about a group for reptile identification. When one person posts a question, there is often a string of comments that follow with no relevance to the original topic (often making fun of the inquirer). Participants seemed to take a neutral stance towards negativity. Perhaps it is accepted that some people will be negative, and that this does not necessarily detract from the overall experience of staying connected. The one con that all participants seemed to see clearly was the potential for social media to distract them from doing other things such as homework.

A second challenge associated with social media, and touched on in the memo was the distraction factor. Students acknowledged that social media sometimes distracts them from other, more productive tasks such as schoolwork. This again relates to the idea of *balance and blend* in which peer culture, learner interests, and academics can be blended, but may also require balance as individual entities. Students described the nature of the distraction as automatic at times. While they did not go into detail about the specific process of becoming distracted, it is possible that the wealth of information available through social media in the form of posts by friends and family, news, and links to other resources may encourage users to explore things that they would not have originally. Students stated:

“Cons would be, like it’s a time waster you know instead of like sitting there quietly for ten minutes thinking to yourself or thinking about your homework you’re sitting there flipping through peoples’ newsfeed or clicking on news like it, I think it distracts you from other things.”

“I’d say it affects my sleeping at night because I’m like, ‘Oh I’m sleepy so I’m gonna go into bed’ and I’m laying there and then my phone’s right there, cause I use it for an alarm so it’s like, distraction and then I can’t fall asleep and then I just get up tired and everything.”

“Most of the time I’m like, doing work, and I’m like, ‘I really don’t wanna be doing this right now.’ Then I just like, without even thinking I grab my phone and start looking like it’s not even like a con, it’s not conscious like I’m not aware of what I’m doing at this

point like I just like grab my phone and I, and then like I'm like, 'Oh I'm looking at *Facebook* right now.' Like it's just kind of like a reaction I think.”

With distraction as a challenge, it will be important for instructors to note that they may be competing for students' attention when integrating social media into educational settings. Therefore posts should be engaging and incorporate a variety of visual media – ideas that had previously been described. Creating engaging posts may draw students into participating within the learning community and interacting with the materials presented there.

The other two challenges mentioned during the focus group were somewhat related. The first was the need for meaningful posts, which described instances in which students discussed the lack of meaning in experiences of social media in academic settings. Examples would include the use of a course social media page for announcements, but not for teaching or discussion of concepts. While students were open and willing to experience social media as a part of their academic lives, they did not see that it was used effectively at the present time.

Students stated:

“Yeah the only class I have now is my Bio lab that made me get a *Twitter*. Which I don't see the point of. You know, and cause it's, but then, to be fair it's not like she, or the class engages anything else on *Twitter*, it's basically just, 'post an article on *Twitter*, post something you learned today.' But maybe I just don't know how to use *Twitter* but there's no engagement or talking about anything important you're just putting your homework up there really so it's not where you have anything...”

“I actually do have one I forgot it was like a page for [organization] it's one of the living and learning communities but like, it's usually, announcements are usually through emails and stuff like that and the *Facebook* page was just for like um, pictures or something that we took from like an event so it's not really like useful, it's just kinda there.”

From excerpts such as these it was observed that students were appreciative of posts that furthered their learning experience beyond simple updates on the state of the class and posting pictures of events. This relates back to the recommendation to have responsive instructors who

can effectively communicate ideas. Meaningful posts should encourage student exploration of materials presented and so increase feelings of community and support. The final challenge, identified as post lengths and frequencies goes along with this idea. Specifically, students discussed how their willingness to explore materials was somewhat dependent upon the length of the post. Shorter, more concise posts were appreciated over lengthy posts. The following conversation illustrates this idea:

“Yeah like when you have to hit ‘continue viewing’ you know...”

[Group laughs]

“It has to be really compelling.”

“This’s the difficult part about like *Facebook* and stuff is, because you’re used to seeing the shorter stuff. So someone posts an article you’re like, ‘Oh! Oh, this is more than a paragraph. Oh ok.’”

“Exit.”

“Nevermind.”

[Group laughs]

“I feel like 200 words would be like max, like that’s pushing it, 200, 300 words is a lot like...”

“Well I guess that’s like the one thing that was good about *Twitter* cause it had like a maximum like character count, so nothing was ever too long. But, then that’s like the only pro I see.”

From this discussion, it was observed that there must be a balance between posts that have meaning and length of posts. This may be a difficult factor to balance for an instructor since posts must include enough detail to convey important information without exceeding the length at which students will avoid exploring it.

Summary

In summary, this study has provided some limited evidence to suggest that students in the study were open to blending social media use for recreational purposes and academic purposes. Students in the study indicated through the survey that they may have already been using social media to communicate with classmates and instructors. Responses during the focus group were indicative of a willingness to have educational experiences through social media, but that those experiences needed to be more meaningful than simple announcement-style interactions. Still, based on the lack of participation during the study period, there was no solid evidence that students were engaging in connected learning via the development of a learning community. Thus, special attention was given to identifying potential recommendations and challenges associated with social media use in academic settings.

Research Question 2: How can social media be used as educational tools for promoting collaborative learning experience?

The connected learning framework involves active participation on the part of the learners, leading to productive social interactions within learning environments. These productive social interactions define collaborative learning in which students are willing to share and discuss ideas with one another in a community environment. Without the development of a community, students may not engage in collaborative learning, choosing instead to avoid direct participation through lurking behaviors. Students participating in the study did not post or interact with one another very often during the study period. In order to shed light on this phenomenon, students participating in the focus group were asked to share their ideas on the factors that may have contributed to a lack of community during this particular study. It was intended that these responses would provide some insight into the factors important for

establishing community through *Facebook*. These factors may then be discussed as areas of focus when recommending ways to integrate social media into educational settings for the purpose of collaborative learning.

The students that participated in the focus group discussed a few different topics related to the establishment of community through social media sites including *Facebook*. As observed in the previous section, students were open to the idea of having social media integrated into their academic lives. In addition to this, students also mentioned the communication benefits of social media as some of the main points to consider when improving on social media in educational environments. When asked whether students agreed with the statement that social media use in class would promote feelings of community, students indicated that they somewhat agreed with no statistically significant differences between pre- and post-study responses ($p = 0.77$).

The establishment of community through social media was a category developed to include codes that described ways in which participants formed communities through social media sites including *Facebook*. Consistent with the literature, students indicated that they used social media predominantly to maintain relationships with people that they already knew such as friends and family. Though there appeared to be a sort of social pressure to engage with others through *Facebook* in particular, students discussed their involvement with multiple communities within social media sites and how group coordination was one of the main benefits. Students also talked about how participation in a social media community bred more participation, which furthered the community feel. For example, commenting frequently on a topic could encourage others to comment on the same topic. Figure 5 shows the frequencies for the codes developed to describe the establishment of community through social media.

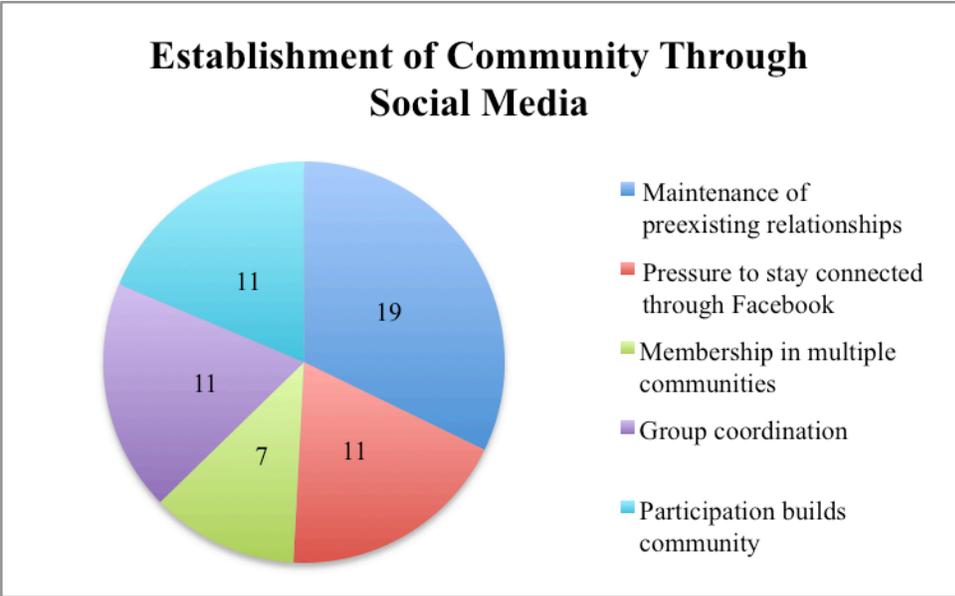


Figure 5. Establishment of community through social media. This figure shows the incidences in which students discussed community building through social media.

Students most often talked about maintaining pre-existing relationships as a reason why they used social media sites such as *Facebook*. They used *Facebook* and other social media sites as a way to keep in contact with others that they might not be able to see in person as often. Friends and family members were both mentioned. Students from the focus group stated the following:

“I value family a lot, so like being able to see like, just like even my little brothers or siblings or um, aunts and uncles being able to connect with them? Um, I kinda see, it’s like it’s funny to see them post but then again it’s like a good way to stay connected that way.”

“...I like *Facebook* a lot just cause I think it’s, a lot like, I don’t know, friendlier? Like user friendly and it’s just like not as much like, inappropriate contents or whatever it’s like a friends and family thing like I have lots of my like friends’ moms and parents like on like friends with me and stuff like that? That’s like, that’s like friendlier.”

“Yeah I guess recently, um, it was like when I was younger my mom kinda had a falling out with her side of the family but now as we’re older you know, we found some of them on social media and now we’re all friends again so people that I haven’t really thought about or talked to for a while, you know I learned that one of my aunts is only two hours away so things like that I guess reconnecting with people who, it would be really hard to

figure out how to reconnect with them otherwise. You know if you don't have their number or haven't talked to them in a while."

From these excerpts, it can be observed that students place high value on the use of social media to maintain contact with people that they have known through previous offline experience. However, it was also observed that there was a distinct social pressure for students to interact using social media in order to stay connected to the majority of friends and family already using it. This was particularly true of *Facebook*. When asked about the driving force that resulted in students creating social media profiles, the following discussion occurred:

"I think it was just kind of like a fad at one point, and everyone just used it so everyone just made one."

"Sounds about right."

[Group laughs]

"Right, that's how my friends were keeping in touch so if I wanted to keep in touch with them I kinda had to do too."

"Yeah, it was like, like a 'do it or don't' like if you didn't do it, then you were out of it and you weren't connected with those people so it's like you had to make one to be connected with those people."

"I feel like it was also kind of like, 'What are they talking about?' Like you were curious as to what they were talking about so you made one to see what everybody was talking about."

From this discussion, it was observed that students felt a need to become involved with social media to stay connected to others who were already using it. They mention that social media was a "fad" where "everyone just used it." The words "had to" are also used, indicating that students felt that they would be left out of being in touch if they did not choose to join *Facebook* or other social media sites. This perceived need to stay connected through social media is highly relevant. When students feel that they need to join *Facebook*, it is indicative of

high integration of *Facebook* into peer culture. Being involved in a social media community is seen as the norm, which may push students into creating profiles through *Facebook*, *Twitter*, and *Instagram*.

Over the course of the focus group, it was also observed that students were involved in a number of different *Facebook* groups, some of which could be considered educational or interest oriented towards a specific topic. Involvement in educational or interest-oriented groups was seen as a way in which students blended their recreational social media usage with learning. This learning may have occurred via *Facebook* groups associated with particular courses, or through personal exploration of a topic leading to group involvement. These social media communities did not necessarily consist of friends and family – something that would be considered typical of recreational social media use as explored through current literature. The code for membership in multiple communities was developed in order to capture instances in which students talked about involvement in social media groups or organizations that were unrelated to specific recreational interactions with friends and family. Since the primary reason that students discussed for joining social media was to maintain preexisting relationships (forming the primary community of the student), extra involvement with different organizations and groups was conceptualized as a way that students were able to blend learning experiences with recreational social media usage. In the following excerpts, one student discusses her involvement with a reptile enthusiast group created through *Facebook*:

“I know like one group I’m part of, it’s a sailfin dragon group and that one’s a friendly group not an arrogant one so people will post things I mean it’s neat because, um, the lizards are over in Indonesia so we have people from Indonesia and the Philippines and all over the place and like, helping each other out like they’ll post a question about the care of the animal and everybody’s helping out to um, you know offer advice and I dunno I just think it’s kinda cool.”

This example is particularly important since the student discusses the community feel of the reptile group, as well as a way that she blends her social media use to explore her personal interest with use for learning. Even though she does not necessarily know all of the people in the group personally, she feels that everyone involved in the group is willing to provide help and advice. Thus, interactions conducted through *Facebook* need not be limited to the immediate relationships that students have. Their involvement can be expanded to include interest groups and perhaps even social media groups related to specific courses that they may take. The following memo was written to capture and develop the idea that students have the ability to transition between recreational groups and potentially academic groups with ease when using social media:

Memo 4: Levels of Connection - I'm noticing that these participants have connections on many different levels through Facebook specifically. For example, many stay in touch with family, but they also stay in touch with friends that they already know, people that they meet and interact with through Facebook groups, and even to current events going on worldwide through the news feature. It is possible that multiple communities are formed within Facebook. Some are smaller and more intimate than others, but some communities include a large number of users that may or may not know each other on a personal level. Because users are able to keep track of multiple community memberships, adding academic groups may not be as big a stretch as some people believe. Users seem to transition between communities seamlessly due to the organization of Facebook and the ease of navigation.

In addition to mentioning involvement with multiple communities, students also made specific reference to the coordination of groups as a benefit of social media usage. Students in the focus group discussed the use of *Facebook* to organize events and to provide information, for example in times of crisis. The ability to organize people and activities is an important factor to consider when discussing the development of community through social media sites, and could be useful when using social media for academic purposes. For example using social media for group assignments may provide a way for students to use familiar technology for communicating

with classmates. In the following excerpt, a student discusses a *Facebook* group that was created to inform friends and family of events following the death of a high school athlete:

“Oh, um, my high school? Ok [high school]? Ok we have, um, one of the like quarterbacks, the football captains? Like just recently this past year, I don’t know if you... [name]? Ok he passed away of like cancer and stuff like that so there was a lot of like, *Facebook* groups and stuff and his younger brother, they had like a page to like donate money and stuff like that. Like just uh spreading the word out about like his cancer and just like info but like meetings or like funeral and stuff like that. So that was, yeah, I think that was a positive one.”

In this second excerpt, a student talks about organizing study groups through a *Facebook* page used for a college course:

“And then we have like the leadership community page that we like post about and we also have like there, at one point they tried to make like a study group for like different tests, they’ll like post in the *Facebook* group you know, “Is anybody taking this test? Or like in this class? Would you wanna study together?” And then like they make a group so then they can plan out when to study like on *Facebook*. So that’s like, I think it’s more connecting with like classmates and peers that you could like, work with.”

In this excerpt, a student discusses an experience in which students involved in a leadership community use a *Facebook* group to coordinate study sessions. This lends some evidence to *balance and blend* since social media, which is predominantly used for recreational purposes, is being used to coordinate academic activities. Again, since many of the recommendations for integrating social media into academic settings involve the development of community through socialization and communication with others. Thus, interactions through social media such as group coordination provide another way for students to potentially keep in touch with classmates and instructors for educational purposes.

Another particularly interesting observation from the focus group was that students indirectly discussed how participation in a group begets further participation and builds community. While students did not make this connection directly through their responses, they often talked about the positive experiences that they had through social media – many of which

related to the responsiveness of others and active contributions towards maintaining *Facebook* relationships. For example, one student specifically mentioned that being told “Happy birthday” on her birthday made her feel happy. Another student mentioned that she was able to see pictures of a family member’s new babies, which was particularly positive for her. When specifically asked about the things that might have contributed to more participation on the Learning for Health *Facebook* page, students in the focus group responded:

“I think a lot of people like, if one or two people commented then more people would kinda bandwagon with it and just like, ‘Oh ok other people are commenting, now I can add something to go off of them or contribute.’ ”

“Then sometimes the ‘like,’ the liking the comment thing? That can kinda like start, like goes away from like actually commenting cause it’s like instead of commenting like, ‘Oh yeah I agree with you,’ it’s like, ‘Like.’ And that’s it.”

Here, students suggested directly that participation in communities is sometimes dependent on the participation of others. When a few people in a *Facebook* group comment on a post or indicate that they like a post, the likelihood is higher that others will begin to comment and interact as well. While this does not provide much insight into why there was low initiative for commenting on the Learning for Health page, it is good to note that participation in building community is somewhat dependent on encouraging students to initiate interactions from the start.

Summary

Students in the study did not utilize the Learning for Health site for collaborative learning purposes, since there was a distinct lack of community among members. While students in the focus group proposed ideas related to how communities might be formed through social media in general, there was no evidence of this specifically occurring during the current study.

Research Question 3: How and why do undergraduate students access social media as part of their formal and informal college experiences?

As previously discussed in the first section of the results, students in the study reported that they used social media for recreational purposes such as keeping in touch with friends as well as for academic purposes such as communicating with classmates and instructors. However, within the context of the study, students did not use the Learning for Health page for collaborative learning and the formation of a learning community. Attention was then given to understanding why participation within the study was low despite positive attitudes of study participants toward social media use for education.

Student participation within the current study, meant to provide a more formalized educational experience, was sparse in terms of direct participation. Direct participation was defined in terms of commenting, liking, and sharing resources on the Learning for Health page. Students did not directly participate during this study, but there were several ways in which they indirectly participated. Indirect participation involved behaviors such as submitting questions to the anonymous survey link, viewing posts without contributing ideas (lurking), and responding to polls that the researcher sometimes posted to the Learning for Health page. Figure 6 shows how many students viewed researcher posts throughout the study.

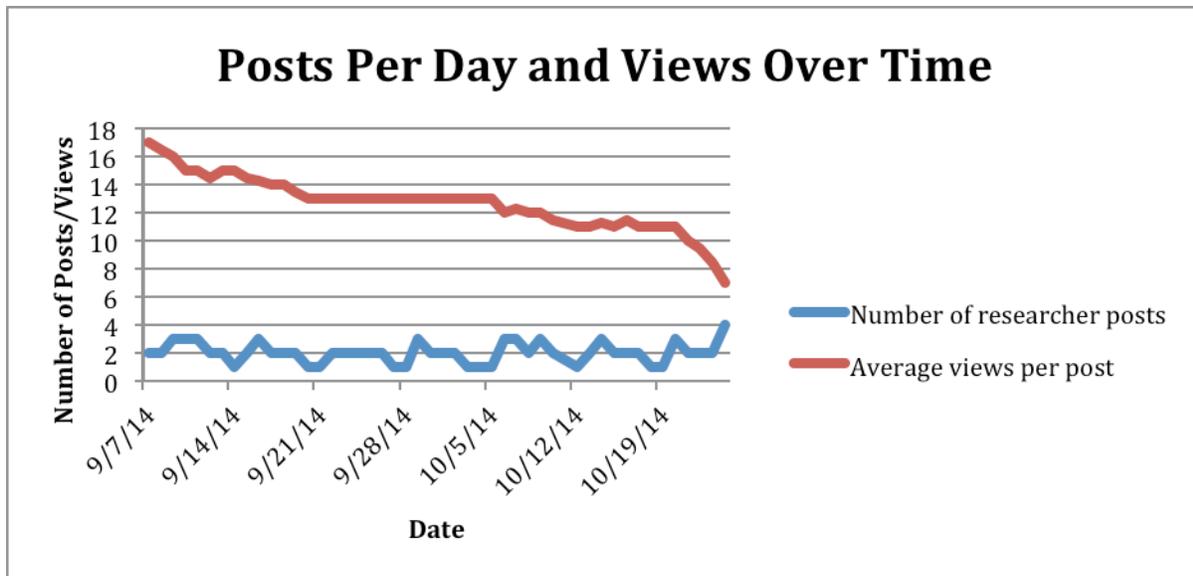


Figure 6. Facebook posts per day, and views over time. This figure shows the number of posts that the researcher created each day of the study, and the number of views by the 17 participants.

Participants were also asked for their ideas on why participation might have been low during the study period. Students suggested that the subject matter was sensitive, which may have discouraged participation. During the focus group, when asked how students interacted with the Facebook study group, two different students stated:

“Yeah like just ‘cause the topic is not something that’s talked openly about? Like I feel like there was kind of, there was kind of like an awkward aspect where no one commented on anything. So that was awkward but I mean, like I, it happens I guess?”

“Yeah I feel like if people, like if you knew them more or were more comfortable with people there I feel like discussion would have been like, more open for that topic. But I feel like the topic that was chosen is like sensitive in our society anyway so I feel like that kind of like stopped people from commenting as much just because they like, that’s kinda like what you’re used to in society it’s like hush hush like you know you keep that quiet like, you know? It’s not something that’s openly talked about in normal society so it’s hard to openly talk about it on social media.”

In addition to the suggestion that the content material presented was too sensitive to promote discussion, students provided other clues about the factors that drove participation during the Facebook study period. These factors were organized into the category of factors

driving participation through *Facebook*. Frequencies for these factors are included in Figure 7.

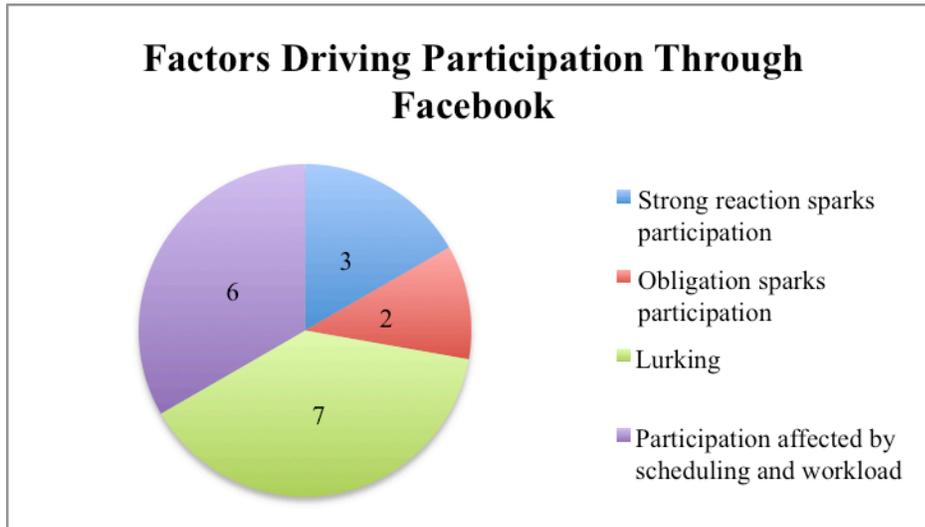


Figure 7. Factors driving participation through *Facebook*. This figure shows the incidences in which students provided insight into factors that influenced their participation during the study.

The following memo tracks the development of this category:

Memo 11: On the Lack of Commentary - It was very helpful to talk to participants about the lack of commentary and discussion on the Facebook page during the study. A number of ideas were thrown out for the reason: lack of knowing anyone in the study group, sensitive topic material, educational feel of the group vs. social, and lack of strong initial interest in the topic. Some of these mirror my own feelings about why there was little discussion. For example, the topic material was something that I had considered as it could make some participants uncomfortable. I was surprised by the participant who said that having a group of friends in a group would encourage participation. While I can see the reason why knowing others would help, I was under the impression that many people join social media groups where they don't know others pretty frequently. Another surprise was the participant who mentioned the educational feel of the group as a reason. The idea was that people went to the group to learn things through absorption, but didn't feel compelled to post as they might in a more social or recreational group. This is something that should be noted for future work using social media for education. More might be needed to encourage students to participate and to build a community.

On a small number of occasions, students indicated that they participated directly as a result of having strong feelings related to a topic. These feelings included emotions such as anger and feelings of amusement or strong interest in a topic. When asked about the reasons driving students to participate through commenting and liking posts, three students discussed:

“That one time I commented I was angry about it so I put something on there. So that’s why I commented on it.”

[Group laughs]

“Yeah if it was like particularly amusing.”

“Yeah I don’t really, like actually post anything really? Even like on normal *Facebook* like, I occasionally like something but most of the time I just like taking information so I think it takes a lot for me to like comment, like a strong emotion about something there or like just a strong interest? But like most of the time I don’t post ever so.”

In addition to strong feelings as a reason for participation, feelings of obligation were also mentioned as a motivator for participating. This may have been an unintended consequence of student awareness of being in a study group as well as the involvement of the researcher as a participant observer. One student stated:

“So it was like a research for your thing so I felt obligated to read everything so I just read everything cause I felt guilty if I didn’t for some reason?”

Consistent with the lack of direct participation on the *Facebook* page, students indicated that they felt that they had learned things from the study, but that they did not feel compelled to post anything to the study page. These instances were coded as lurking behaviors. Examples included the following excerpts from the focus group:

“I would usually check it at like the end of the day because most of the time like in free time that’s usually like when I had time to sit down and look at it and I just read most of the stuff like I clicked on it. I didn’t really interact I don’t really know why but like it was more just me like reading it or like looking at the diagrams I didn’t really comment or anything.”

“Yeah like on other groups when you, even if you don’t know the people that you, well you kinda get to know you know, certain, what they like to post on or what their um opinions are, and um, in the group people didn’t really share their opinions much so you didn’t really get to know anybody I don’t think.”

Further evidence for lurking was found in the post viewing data from the students depicted in Figure 8. From these patterns it was observed that most of the students were looking

at posts, but were not necessarily commenting on those posts. For example, the majority of the students may have viewed a particular post, but chose not to pursue any other actions such as pressing the “like” button or leaving a comment with their thoughts. Lurking was a phenomenon that was not originally considered at the start of the study, but that proved to be common throughout the study period.

Students in the focus group reported their increasing workloads and activities as a reason for their participation declining or becoming less frequent towards the later weeks of the study period. While some students may have started off viewing every post as soon as it was added to the Learning for Health *Facebook* page, they may have changed their pattern, waiting until the end of the week to view all the posts at one time. This may have implications for how instructors might integrate social media into classes in the future since students will inevitably become more involved with a wider variety of activities as semesters progress. Students stated:

“Yeah I mean I commented a couple times or if I caught a poll in time I’d try to answer the poll um, it just depends I would try to check it like once a day. If I had a lot of homework or something sometimes it was every other day or a couple times a week.”

“Yeah I feel like as the semester went, like progressed like things got busier. I feel like that played a lot because towards the end of the semester most people are busier than they were at the beginning of the semester so, like at the beginning of the study like I had more time to read like every single post like as soon as it was posted but then as the semester drew on I didn’t have time for that so I that my interaction did change over time. Like, but it was related to my other activities.”

The pre and post study surveys gathered more general data about the types of social media that participants used. The intent was to know which social media sites were popular among the study sample. With a broader population, understanding which social media sites are most popular can assist instructors who are looking to integrate them into their courses. This is particularly true when familiarity with a social media format, discussed in previous sections of this chapter, was identified as a benefit of the technology. Students indicated in the surveys that

they accessed social media sites multiple times a day with no significant differences between pre and post study responses ($p = 0.34$). Figure 8 shows the different social media websites that students indicated involvement with. This figure includes pre-study survey data from students who completed the Facebook portion of the study with an $n = 17$.

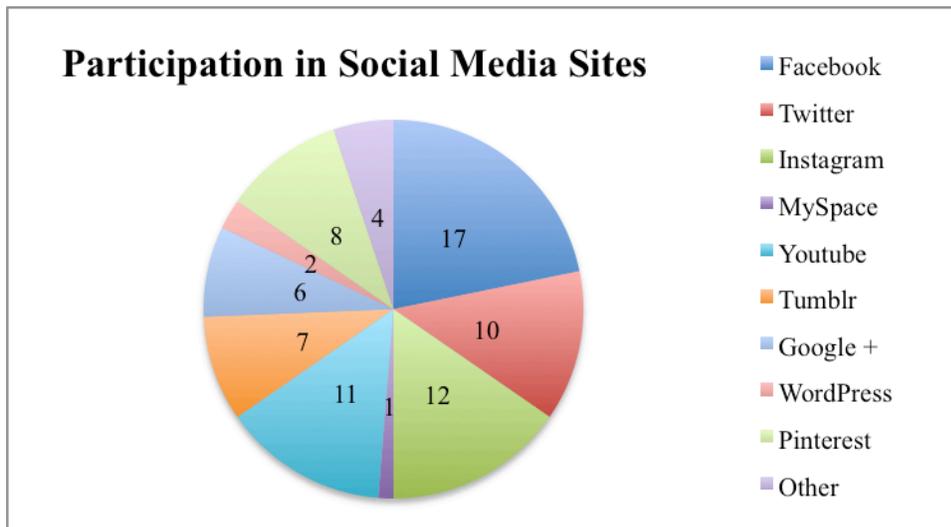


Figure 8. Participation in social media sites. This figure represents the different social media sites that students used.

From Figure 8 it can be observed that *Facebook* remains the most popular social media website among the study participants surveyed. This makes sense with all study participants being required to have a *Facebook* profile for the purposes of the study. However, *Instagram*, *Youtube*, and *Twitter* appear to be equally popular. *Twitter* in particular, although unpopular among the focus group participants, was relatively popular among study participants as a whole.

The *balance and blend* theme was particularly relevant in exploring the ways that undergraduates used social media within their informal and formal college experiences. Again, *balance and blend* was developed to describe instances in which students referenced the connections between their academic life, peer culture, and interests. This could refer to times at which students described dividing their time and also times at which there was crossover

between these factors. *Balance and blend* was worded with the framework of connected learning in mind. The *balance and blend* code was applied a total of 17 times when analyzing the focus group transcript. Students appeared to have a hard time making direct connections between social media usage and their educational lives when asked about it directly as seen in the following example:

“I feel like at this point it’s really hard for us to like, think about some, like learning something just because we wanna learn it. Because right now like, in college at this point we’re like, you have to learn this so you can make a better living instead of, ‘Learn this because it’s fun’ and ‘Learn this because you’re going to enjoy it.’ Like we can’t, I can’t understand that. Like that’s hard for me to think about because I’ve never like had that luxury of being like, ‘Oh I wanna learn about this I’m going to’ just because you have like your time consumed by other things.”

Despite this difficulty, students indirectly discussed their experiences in a way that indicated that connections were present. Whether these connections were obvious to the student was not as clear. For example, one student discusses:

“Yeah I think it’s [referring to social media] really helpful too cause of the immediacy of information? Like I use it, like it’s primarily how I study, you know *Youtube* um, because you know you’re doing a homework problem and you can’t recall 70 minutes of lecture you know and all through your notes which part of it pertains to what you’re doing but all you have to do is type in something that you’re doing into the *Youtube* search and you have an entire video you can watch over and over and over until you understand it.”

In this case, the student talks about the usefulness of the social media site *Youtube* as a way to obtain immediate information. She uses it specifically for studying, as a way to look up information and for alternate explanations of course material. This appears to be a blend of factors described within the connected learning framework. The need for information to satisfy academic pursuits leads the student to explore *Youtube*, a social media site that has been well integrated into her peer culture. Another example follows:

“Like, education’s a part of your life too and like at this point, like I feel like education does like invade into your normal, like your recreational life like already. So I feel like

that would just be like more convenient, like I feel like it's already invading it so I feel like the social media aspect, adding that into it's not making that big of a difference.”

In this example of *balance and blend*, the student feels as if there is a blending of education and recreation that is already present in her life. Perhaps as a result of this, she feels that adding social media into educational settings would not be intrusive. She even states that the addition of social media may be more convenient, indicating a desire to blend the two in hopes of making things easier. In this third example, a student recognizes the connections between all three factors, but also describes a situation in which balancing them can be difficult:

“Maybe to like, but they're all connected so I feel like if you know how to balance them out cause I know like some people would like, would rather like talk with their friends forever than like do their homework so it's like you need to find like a good balance between all three of those. Because I, they are connected.”

From this response, it is important to note that integrating social media into formal learning experiences should be methodical and intentional. While blending may create unique opportunities for learning to occur, students will still need to be able to balance recreational social media use with educational use to avoid distraction – one of the major challenges described earlier in this chapter.

Summary

In summary, students in the study did not use the Learning for Health page for the purposes of discussion or other direct methods of participation. Students did report that they viewed posts on the Learning for Health page, but that for the most part, they did not feel compelled to contribute. These behaviors were discussed as lurking behaviors, which will be discussed in greater detail in the following chapter. While students reported that they were open to integrating social media into their educational experiences, connected learning was not evident in the form of direct participation during the study period. However, students did discuss

instances in which their academic and recreational uses of social media affected one another outside of the context of the study.

Chapter V: Discussion

In this chapter, the results will be discussed in relation to the current literature. The section will begin with a discussion of how study results add to the existing literature base. A second section will follow outlining the implications that these results have for integrating social media, and specifically *Facebook*, into educational settings. Following this, the limitations of the study will be discussed. The chapter will end with a summary and final conclusions. Table 2 summarizes the major descriptive and prescriptive assertions developed from the current study:

Table 2

Descriptive and prescriptive assertions for discussion

Descriptive Assertions	Prescriptive Assertions
There was a lack of participation observed throughout the current study, perhaps due to a lack of social presence among participants.	Instructors should maintain responsiveness to students if they choose to integrate social media into a course.
A lack of social presence may have contributed to the lack of community development among participants.	Instructors should vary the format of posts created through social media, taking advantage of different types of visual media.
Lurking, or viewing online materials without contributing to discussion, impeded the development of community.	Educational posts created through social media should be intentional, and meant to convey meaning in a concise manner.
There was no evidence to suggest that connected learning was occurring during the study period.	Frequent monitoring of social media sites is necessary to manage inappropriate social media use and the development of misconceptions.
Participants in the study were open to integrating social media into their educational experiences.	Social media should be integrated as an intentional supplement to a course, requiring significant time and effort.
Participants expressed a desire for more meaningful integration of social media, involving responsive instructors, the use of visual media, and frequent monitoring for inappropriate content.	The affordances and limitations associated with social media integration should be acknowledged and investigated in greater detail to better understand the factors associated with effective use.

Social media and connected learning experience

Connected learning has been defined by Ito et al. (2013) as a highly social process in which blending occurs between major factors in the lives of youth and young adults. These factors are academic life, peer culture, and learner interests. While these factors are often viewed as separate and perhaps competing factors, the idea is that learning has the potential to occur at the boundaries where these three factors intersect and influence one another. The results of the study did not provide evidence that the social media site *Facebook* was used for connected learning among the study sample. This was due to a lack of participation in the form of direct commentary and discussion, factors that would have been indicative of community building and collaboration. Despite this, students in the study indicated through survey reports that they were open to the idea of blending recreational and academic social media functions. More research will be necessary to determine whether social media may result in connected learning among undergraduate students. While social media have been reported as one of the three major interactions contributing to college experience (Hrastinski & Aghae, 2012), this study did not find evidence for the social interactions indicative of community building or connected learning. Previous chapters have discussed the work of Merchant (2012), who identified three areas of research for social media in educational settings. This study was centered on learning *about* social media usage among undergraduates as well as how undergraduates learned *from* social media sites such as *Facebook*. While some conclusions can be drawn *about* how students from the current study sample typically use social media in their daily lives, there is very little evidence to specifically identify how students learn *from* social media. Thus, further exploration of educational social media interactions will be necessary to provide insight into this area.

A major part of connected learning theory is the social interactions that occur when students blend areas within their peer culture, interests, and academic lives. When attempting to

understand the interactions occurring through social media for educational purposes, the idea of presence on the part of the instructor as well as the students becomes important. McKerlich, Riis, Anderson, and Eastman (2011) discuss learning through online environments in terms of teaching presence, social presence, and cognitive presence. These ideas are highly relevant in conceptualizing the use of social media for educational purposes, and were used to inform the study design. Teaching presence is used to define the role of the instructor in guiding students through the learning process, social presence is the presence of the student's actual self and perceptions of others within the online environment, and cognitive presence is the ability of the student to learn and form ideas through the online environment. True to the idea of *balance and blend*, all three areas should be considered in the development and implementation of social media for education in the future. Results from this study indicated that students, while open to the integration of social media into courses, desired meaningful interactions (cognitive presence) and the responsiveness of the instructor (teaching presence).

The current study was designed to have a substantial teaching presence in the form of researcher posts and responsiveness to student questions through the anonymous survey link. Teaching presence has been specifically linked to satisfaction in students by Akyol and Garrison (2008), providing evidence for including it as an area of focus within the current study. The researcher had had previous experience with using *Facebook* as a supplement for Reproductive Physiology lab sections that she taught in the past. This experience had led her to post to the Learning for Health page between one and three times per day, and to respond to any submitted questions within 24 hours of the submission. It was intended that responsiveness would encourage students to ask questions and become comfortable interacting through the Learning

for Health page. Still, student participation remained low throughout the study period, with the majority of students viewing the posts but avoiding direct commentary.

Social presence, the second presence identified by McKerlich et al. (2011), was intended to be high. To encourage participation and community development through the Facebook page, the researcher included discussion questions in many of the posts, created polls for students to answer, and included fun facts and resources meant to stimulate conversations. Social presence in particular has been investigated as relevant to the participation of online users in interest communities (Zhuang, Chen, & Zhang, 2014). Users were found to remain involved in online communities when they felt that they were able to portray their true selves, and felt the support and openness of others in the community. Students in the study sample lacked feelings of social presence, choosing to avoid interactions with others and to view materials when they felt that they had the time. In addition to this, some students felt that they were obligated to explore study materials, which may have also contributed to lack of contribution. The lack of contribution in the form of comments and likes, identified as lurking during the analysis, may have impeded the formation of a learning community. Without commentary, there was little opportunity for discussion among participants.

Social presence, associated with feelings of community and support, may be impeded if there is an overabundance of lurking behaviors. Lurking was a behavior that was often observed within the current study period, but that was unexpected prior to the start of the social media phase. Dennen (2007) defines pedagogical lurking as the phenomenon that occurs when students read and reflect on posts and other course materials, but do not leave evidence in the form of comments or other interactions. Dennen (2007) found that students who engaged in lurking were still actively involved in reading posts and scoping out the ways that other students participated.

In addition, when those students eventually chose to engage in discussion, they found the experience more worthwhile. Arnold and Paulus (2010) have also explored community building and lurking behaviors through the social media site *Ning*. Consistent with data from the current study, Arnold and Paulus (2010) reported that students often appropriate technologies such as social media in ways that are unexpected by the instructor. However, even though students may not appear to be actively using the materials that are presented and available, they may still be quite involved in the learning process. This would indicate cognitive presence, or the ability to learn and draw connections from the online learning environment (McKerlich et al., 2012). Due to the high amounts of lurking observed in the study, it cannot be determined whether students perceived cognitive presence based on the interactions that occurred. While students reported through survey data that they had learned things from the study, this does not provide enough evidence to indicate whether connected learning occurred during the study period. Further research in this area would do well to focus on the more specific roles of social and cognitive presence in educational social media experiences, including factors contributing to the two.

When participation and discussion occur through social media, connected learning becomes possible as ideas and resources are shared amongst users. While this study sought to explore the use of social media for more formalized academic purposes, ideas associated with connected learning were originally intended to apply to less formal instances of learning. For example, the blending of academics and the personal lives of undergraduate students may provide a basis for understanding the extension of the formal learning environment into much less formal settings such as the home (Arnold & Paulus, 2010). The idea of *balance and blend*, and the idea of utilizing social media as supplemental to formal classroom environments appear to be supportive of this idea. This is also consistent with previous work associated with formal

and informal learning environments, suggesting that the use of internet access can bridge the boundaries between the two (Lai, Khaddage, & Knezek, 2013).

The current study used *Facebook* to provide information on sexual health to undergraduate students. However, the implementation of the Learning for Health page presented challenges that should be considered whenever social media are integrated into educational settings. Overall, more work is necessary to determine how instructors and students might appropriate social media resources for educational purposes no matter the subject material. The current study was run as if it were a short course, with different topics each week, presented in a specific order. Students in the study indicated that they felt that they had learned things from the Learning for Health page during the study. While changes in content knowledge were not assessed for the purposes of the current study, future research would do well to investigate factors contributing to the success of social media efforts in providing educational content to students as a whole.

Another point of interest from the current study was that students in the focus group indicated that they did not believe that social media had been used very effectively in their past experiences prior to the study. For example, one student had discussed the use of *Facebook* for announcement style posts. While she appreciated being informed with things such as changes in the class schedule, she also mentioned that more meaningful interactions would be of benefit. The Learning for Health page was designed to present information on a variety of topics arranged by week. These topics were determined through investigating areas of misconception and interest among young adults and teenagers (Wynn et al., 2009). Thus, the study was intentionally designed to cover specific topics, giving it more structure than that described by students in the focus group. The desire students expressed for more meaningful social media use

was consistent with Waldeck and Dougherty (2012), who have reported that students feel more motivation to learn when they feel that technology is being used effectively. Some instructors may not know how to integrate social media effectively, which may contribute to a lack of participation or engagement among students. Thus, instructors should always integrate social media intentionally, and with a plan rather than providing the educational opportunity without guidance or support. While participation was low throughout the study period, the researcher used the Learning for Health page to intentionally provide information on predetermined topics. Students also reported through survey data that they felt the researcher fostered an open learning environment. With this in mind, and consistent with the high incidence of lurking among the study sample, it is possible that the lack of participation was not due to a lack of teaching presence, but to a lack of social presence in the form of supportive peers.

Implications for the integration of social media into educational settings

Based on the results of the current study, it appears that there are several things to consider when integrating social media such as *Facebook* into educational settings. Many of these factors have to do with the virtual presence of the instructor, as well as the social presence of peers and the cognitive presence of the learner (McKerlich et al., 2011). These include varying the format for resources and information posted via social media websites, maintaining open communication with students, using social media as an intentional supplement to traditional classroom teaching methods, and fostering feelings of community through social media.

Students in this study indicated that the use of visual media was one of the most positive things associated with social media and *Facebook* in particular. This was true not only of their recreational social media usage (where photographs are used to maintain contact with friends and family), but also in the context of the current study where students expressed their appreciation

for videos and diagrams included on the Learning for Health page. Consistent with this finding, Baird and Fisher (2005) have also reported that using multiple forms of media may be particularly engaging to learners, and Stokes (2002) has promoted the use of visual media for enhancing learner experience. Recent work by Peterson (2014) has also explored different ways to integrate visual media, finding that fully integrated visual images with shorter chunks of interspersed text were more popular with learners than combinations involving fewer images and more text. With this in mind, faculty would do well to vary the format for posts that they create. While text-only can be informative and direct, students reported that they appreciate posts more when words are paired with something that they can view and interact with.

Maintaining open communication is a second important factor to consider when integrating social media into educational settings. This is a factor directly associated with the idea of the instructor's virtual or teaching presence (McKerlich et al., 2011). While it may appear that students have an inherent interest in participating through social media, they require attention on the part of the instructor for more meaningful interactions to occur. Students in this study had indicated that they wanted responsiveness in the form of feedback from instructors and more knowledgeable others such as TAs. These findings were consistent with a study by Callaghan and Bower (2012) in which higher involvement by the instructor was associated with more of an "educational" feel, and greater assignment quality through the social media site, *Ning*. By contrast, less instructor involvement resulted in more of an informal feel and discussions that lacked depth in relation to the content. Students in the study were appreciative of content that had more depth to it when compared with simple class announcements. While social media provide opportunities for students to express their concerns and ask questions, the opportunities are ineffective if those concerns and questions go unanswered, or if responses are

not timely enough to prove helpful. Thus, the integration of social media requires a significant time commitment to ensure that students are supported in ways that make interactions meaningful. This is consistent with other literature in which teaching presence was associated with student learning and satisfaction (Akyol & Garrison, 2008).

Instructor responsiveness is also important for monitoring inappropriate social media usage and inaccurate content. For example, students who choose to put other students down, or who create posts that contain inaccurate information should be corrected in some way. Students in the current study identified inappropriate commentary from other users as a common downside of using social media, with the idea appearing throughout the focus group interview. However, in an educational environment, the instructor maintains responsibility for keeping communication open to ensure that students feel safe and supported. While discussion among students is an important part of the learning experience, instructors should ensure that no misunderstandings are perpetuated through these conversations. This is especially true since commentary created through social media is available for others in a group to see and refer to at any time.

Due to several of the challenges to social media integration that emerged from the current study data, it is proposed that social media sites such as *Facebook* would benefit students and instructors most as a supplement to an already established course. This is in contrast to the Learning for Health page, which was presented as a separate short course with specific topics and material to be covered. Based on the challenges experienced during the current study, it would be difficult to conduct a course entirely through *Facebook* due to the idea that students typically avoid longer posts when exploring materials. Students in the study preferred shorter posts with fewer words and more visuals. They also accessed the page a few times a week. If an

instructor were to limit the content and frequency of their posts, posts would be concise and informative, but instructors might not have the ability to convey enough information over time. While this challenge may have been context dependent for the study due to the lack of requirements for direct participation and a lack of incentive (such as grades), it remains an important fact to consider. Posts created through social media for educational purposes should be meaningful in that they provide important information, but in manageable chunks that students will find approachable.

Using social media as an intentional supplement has the potential to extend the learning environment outside of the boundaries of the traditional classroom setting. Since students access social media as part of their recreational time (Luckin et al., 2009), and since many are familiar and comfortable with the technology, course pages created through social media may allow students to easily blend major parts of their lives. For example, a student may seamlessly transition from having a conversation with a friend about last night's football game to posting a question about cell metabolism to a course page on the same site. However, it is important to reemphasize that the use of social media as a supplement must be done with intention. For example, concepts that are covered in class should be supplemented with extra material provided through the social media site. Posts and visual media should be used to reinforce and elaborate upon ideas. Incorporating some humor, or related resources that are purely interesting may also encourage student participation and the development of a learning community.

Students already use social media for maintaining relationships with friends and family (Madden et al. 2013a), and were quick to highlight the advantages of coordinating groups and events through social media. Both of these ideas center on the usefulness of social media sites for communication and collaboration. Feelings of community are dependent on the development of

relationships among community members, whether they are based on mutual interests or common goals (Wenger, 1998). While it can be expected that some students will engage in lurking behaviors, avoiding direct participation but still exploring course materials and resources, the formation of community depends on the ability of the group as a whole to interact (Sfard 1998). With this in mind, instructors should prompt and guide meaningful discussion, giving more students the opportunity to share their thoughts and suggestions.

Finally, caution should be taken when integrating social media into educational settings so that instructors do not attempt to use sites such as *Facebook* as learning management systems. Learning management systems such as Scholar and Blackboard have important functions in academia, but have different affordances than those offered by social media sites. Veletsianos, Kimmons, and French (2013) have outlined the frustrations that instructors may experience when using social media in a manner similar to how they would employ a learning management system. Other frustrations associated with digital communication, including increased work time and increased stress levels, have been outlined in a previously mentioned report by Seaman and Tinti-Kane (2013). Specifically, the social and community affordances of sites such as *Facebook* or Twitter should remain the focus. Instructors hoping to make effective use of social media should intentionally draw from the recommendations listed here, and avoid imposing previous experience with alternative technologies upon something that may be quite different. While it may be easy to assume that social media could function as more inviting learning management systems, they may be far better employed as supplements to educational experiences that are already established.

While the current study focused on the self-reported attitudes of undergraduate students. Future work should also investigate the perspectives of faculty regarding social media use for

education. Work in this area may result in the identification of further benefits and challenges that should be taken into account when integrating social media into educational settings.

Limitations

Several limitations should be taken into account when interpreting the results of the current study. First and foremost, the sample size was small, which makes study results highly context specific, and may be responsible for the low reliability calculated for pre-study survey items. Study participants were predominantly female and in their first year of study as freshmen, which may have influenced survey results. While every effort was made to recruit more students within the time frame for the study, finding voluntary participants was more difficult than anticipated. It is proposed that a lack of incentive (grades, extra credit, gifts) may have contributed to the reluctance of the students in the recruitment pool to participate. Thus, it would be interesting to follow up with larger sample sizes to more thoroughly investigate the connected learning experience of undergraduate students through social media.

A second limitation could be considered the lack of direct participation that was observed during the Learning for Health seven-week study period. While it was expected that students would appropriate the *Facebook* page for discussion and inquiry, their lack of commentary made it difficult to understand how students interacted with the page simply from their posts. As a result, it would be beneficial to further explore participation patterns that students use while interacting through social media in future work. The phenomenon of lurking in particular should be monitored as a primary focus.

Due to the lack of participation by students on the Learning for Health page, data from the focus group was particularly instrumental in the interpretation of results from the current study. Originally, the researcher had intended for direct commentary through *Facebook* to

provide the bulk of the data for analysis. When students did not participate in the study as intended, the focus group became the primary way for the researcher to further investigate why students might have chosen not to contribute. Despite this, the focus group was beneficial in allowing students to discuss their experiences with the study and social media usage in greater detail. Thus, it could be worthwhile and interesting to conduct a larger number of focus groups in future work to explore undergraduate experiences with social media in more depth.

It was proposed that the lack of participation through the Learning for Health page might have occurred due to lack of incentives. This may have limited the number of students willing to join the study from the onset. From the results of the study, it has also been proposed that social media might be better utilized as a supplemental educational tool for an already established course. In the future, it might be interesting to perform a second version of this study, more fully integrated as a course supplement. This may help to increase the number of participants, who may see the greater personal benefit of receiving assistance with their coursework. It may also lead to a greater amount of discussion and student contributions to the social media page.

The current study focused on the self-reported attitudes and ideas of undergraduate students, but did not survey the attitudes and ideas of college level instructors. While this study provides some insight into how this sample of students felt about social media use for education, it does not take into account the perspectives of instructors. Thus, an interesting area of further research may be the perspectives and experiences that instructors have with the use of social media in educational settings. This would help to provide a clearer and more complete picture of the attitudes and ideas surrounding social media use in educational settings.

A final limitation was the inability of the researcher to determine when students viewed posts. While the *Facebook* website provides data on which students viewed a post, these views

are not time-stamped, meaning that it would have required continuous tracking on the part of the researcher to monitor student views throughout the day. Having this data would have provided interesting information about student participation patterns. For example, it would have been easy to distinguish between students that viewed posts throughout the week, compared to students waiting until the end of the week to read all posts at once. Having a system for keeping track of student views would be of great benefit to researchers performing similar work in the future.

Summary and Conclusions

To conclude, students who participated in the current study indicated that they were open and willing to use social media, and particularly *Facebook*, for educational purposes. While participation on the Learning for Health page was low, the inclusion of a focus group session provided an opportunity to investigate what might have driven participation or the lack thereof. Lurking was a common phenomenon that could be an interesting area of research in the future. In doing so, it might be interesting to view lurking not as non-participation, but as a different way that students might use social media for learning purposes. Instructors who wish to integrate social media sites into college courses should do so with intention, keeping in mind that the success of the effort will depend upon the amount of time that they are willing to devote to maintaining responsiveness and monitoring content. With enough commitment, it is possible that social media may provide unique and interesting opportunities for undergraduate students to continue learning outside of the formal classroom environment. This idea of anytime, anywhere learning is definitive of connected learning experience due to the blending of peer culture, learner interests, and academic life. In looking towards the future, social media may have the potential to become more effectively integrated into educational settings. Still, if this is to

happen, it would be interesting to examine them as separate from tools that have been used thus far, both giving credit to their affordances and acknowledging the many challenges presented.

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Appendix A

Pre- Study Survey Instrument:

Part 1: Demographics

1. Please type in the name that you go by on Facebook. This is important so that we can make sure to add you to the group Facebook page: (fill in the blank)
2. Please type in your email address: (fill in the blank)
3. Please type in your age in years: (fill in the blank)
4. Please select your race/ethnicity: White, Black/African American, Hispanic/Latino, American Indian, Asian/Pacific Islander, Other
5. Please indicate your sex: Male, Female, Other, Prefer not to say
6. Please indicate your current year in college: Freshman, Sophomore, Junior, Senior
7. Please list your current major(s) in college: (fill in the blank)

Part 2: Social Media Usage and Attitudes (some adapted from Madden et al., 2013a)

1. How often do you access social networking sites such as Facebook or Twitter?: Multiple times a day, Once a day, A few times a week, Once a week, A few times a month, Once a month, Less than once a month
2. On which social media websites do you have an account? Select all that apply: Facebook, Twitter, Instagram, MySpace, Youtube, Tumblr, Google Plus, WordPress, Pinterest, Other
3. Which technologies do you use to access social media? Select all that apply: Desktop computer, Laptop computer, Smartphone (such as an iPhone or Android), Tablet (such as an iPad or eReader), iPod, Other
4. For what reasons do you access social media? Select all that apply: Keep in touch with friends, Share links or resources, Post pictures, Help with schoolwork, Keep in touch with classmates/instructors, Other
5. Have you ever used social media for educational purposes?: Yes, No, Don't know
6. Please indicate whether you agree or disagree with the following statements:
 - a. Social media are purely for recreational purposes: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree
 - b. Social media can be used for educational purposes: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree
 - c. I would like to see professors use social media as part of their courses: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree
 - d. I would feel uncomfortable having to access social networking sites such as Facebook for a class: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree
 - e. I would feel comfortable using some types of social media for class, but not others: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree

- f. Using social media for class would help me to feel like I was part of a community: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree

Appendix B

Post-Study Survey Instrument:

Part 1: Demographics

1. Please type in your age in years: (fill in the blank)
2. Please select your race/ethnicity: White, Black/African American, Hispanic/Latino/a, American Indian, Asian/Pacific Islander, Other
3. Please indicate your sex: Male, Female, Other, Prefer not to say
4. Please indicate your current year in college: Freshman, Sophomore, Junior, Senior
5. Please list your current major(s) in college: (fill in the blank)

Part 2: Social Media Usage and Attitudes (some adapted from Madden et al., 2013a)

1. How often do you access social networking sites such as Facebook or Twitter?: Multiple times a day, Once a day, A few times a week, Once a week, A few times a month, Once a month, Less than once a month
2. How often would you say that you checked the Learning for Health Facebook page during the study period?: Multiple times a day, Once a day, A few times a week, Once a week, Every other week, Fewer than every other week
3. On which social media websites do you have an account? Select all that apply: Facebook, Twitter, Instagram, MySpace, Youtube, Tumblr, Google Plus, WordPress, Pinterest, Other
4. Which technologies do you use to access social media? Select all that apply: Desktop computer, Laptop computer, Smartphone (such as an iPhone or Android), Tablet (such as an iPad or eReader), iPod, Other
5. For what reasons do you access social media? Select all that apply: Keep in touch with friends, Share links or resources, Post pictures, Help with schoolwork, Keep in touch with classmates/instructors, Other
6. What did you enjoy about being on the Learning for Health Facebook page? (fill in the blank)
7. What improvements would you suggest for social media efforts similar to Learning for Health? (fill in the blank)
8. Please indicate whether you agree or disagree with the following statements:
 - a. Social media are purely for recreational purposes: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree
 - b. Social media can be used for educational purposes: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree
 - c. I would like to see professors use social media as part of their courses: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree
 - d. I would feel uncomfortable having to access social networking sites such as Facebook for a class: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree
 - e. I would feel comfortable using some types of social media for class, but not others: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree

- f. Using social media for class would help me to feel like I was part of a community: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree
- g. I was interested in the materials presented through the Learning for Health page: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree
- h. I felt that the researcher fostered an open learning environment: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree
- i. I felt that I learned something from participating in the Learning for Health social media study: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree

Appendix C

Interview Guide: Undergraduate Students' Experiences of Casual and Educational Social Media Usage

A. Personal Usage of Social Media

Welcome to this focus group session and thank you again for taking the time to be here. We are now going to start the interview process. Please feel free to discuss the questions as you see fit with the other group members. Any insights, related information, ideas, and opinions are welcome. In the first part of this interview, we will be discussing your personal use of social media such as Facebook, Twitter, and blogging sites.

1) What personal characteristics would you say contribute to your social media use?

Prompting Questions:

- *What made you create a social media account in the first place?*
- *Why did you choose a particular social media site?*
- *What do you consider to be social media?*

2) What are some of the pros and cons that you see for using social media?

Prompting Questions:

- *What do others say about social media?*
- *Have you ever had a particularly negative experience with social media?*
- *Have you ever had a particularly positive experience with social media?*

3) How integrated into your daily life is social media?

Prompting Questions:

- *If social media did not exist, what would life be like?*
- *Does your social media usage have any effect on your life?*
- *How do you normally access social media?*

B. Educational Usage of Social Media

Now that we've discussed your personal usage of social media, let's talk about social media usage in your educational life. Remember that social media can take many forms besides Facebook and Twitter such as blogging sites, wikis, Youtube, etc.

4) What do you think of using social media for educational purposes?

Prompting Questions:

- *Have you ever used social media for a class?*
- *Did you enjoy using social media for class?*

- *Why do you think that social media might be used for classes?*

5) Do you learn anything when you access social media?

Prompting Questions:

- *What types of things do you learn about through social media?*
- *Do the things that you learn through social media have any connection to your classes?*
- *Do you learn more from social media or from your classes?*

6) Where and how could you see social media being used in classrooms if at all?

Prompting Questions:

- *What factors might affect learning through social media?*
- *Would it be hard to learn through social media?*
- *What would you like or dislike about learning through social media?*

C. Social Media Usage for Sex Education

Now that we have discussed your thoughts on using social media in classroom environments, I'd like to hear your thoughts about social media usage within the study you've just participated in. To refresh, the study involved the presentation of information on sexual topics through Facebook to undergraduate students.

6) What are your impressions regarding the presentation of information on sex-related topics through social media?

Prompting Questions:

- *How comfortable did you feel learning about sex-related topics through Facebook?*
- *Do you think that Facebook or other social media formats have benefits for presenting information on sex-related topics?*
- *What types of posts were most interesting to you during the study?*

7) How did you interact with the Facebook group during the study period?

Prompting Questions:

- *What posts did you find the most interesting?*
- *How much interaction did you have with the Facebook group?*
- *What made you interact or not interact with content on the Facebook group?*

8) Did you feel that there was the presence or lack of community within the Facebook group?

Prompting Questions:

- *What types of interactions did you have with other group members?*
- *What contributes to feelings of community on Facebook and other social media websites?*

- *Did participating in a group affect your learning?*

9) What improvements would you like to see in a potential new version of the study?

Prompting Questions:

- *What did you get out of participating in the study?*
- *What do you wish that you had come out with after the study?*
- *What was your reaction to the posts that were provided?*

10) Where do you think that young adults get most of their information about sex related topics?

Prompting Questions:

- *Which sources do you think might be better than others?*
- *How do you distinguish between good and bad information?*
- *Does the topic that you need information about determine the source that you seek?*

11) Do you think that you will be able to use the information that you learned during the study?

Prompting Questions:

- *What are some of the most interesting things that you learned?*
- *How does what you learned apply to you and other undergraduate students at Virginia Tech?*
- *Has the information that was presented influenced your ideas about sex related topics?*

D. Connected Learning

In this final part of the interview, we will be discussing the connections between social media, peer culture, and academic life.

12) Do you see any connections between social media, your interactions with peers, and your academic life?

Prompting Questions:

- *How do you think that the three are related?*
- *How important are each of the three individually?*
- *Do your interactions with any of the three influence your interactions with the others?*

13) What factors play into your personal learning experience?

Prompting Questions:

- *How do you learn?*
- *Does participation in groups, teams or communities affect your learning?*
- *What do you enjoy learning about?*

14) How do you navigate the boundary between learning in a classroom and learning outside of class on your own time?

Prompting Questions:

- *How is learning in class different from or similar to learning about the things you want to learn about?*
- *How does the constant availability of internet access affect your learning?*
- *Do you feel that in class and out of class learning can be blended?*

15) Please feel free to provide any closing remarks, thoughts, or ideas at this time.

Appendix D

Week 1: Male Reproduction

September 7, 2014:

One of our members had listed the epididymis as one of the main parts of the male reproductive tract. This is a great start. This link has some other *basic* information about the male tract:

<http://www.ashalsexualhealth.org/sexual-he.../just-for-men.html>

As we go through this week, we will be focusing on different sections of the tract in detail (the journey of the sperm!), so feel free to explore this page as a little bit of a roadmap.

Finally, here are a few fun facts about the reproductive tract of men to start your week off:

1. Men produce close to 500 million sperm per day - that's a lot of baby-making potential.
2. Men have the largest penis size of all primates. However, chimpanzees have testicles that are twice as large.
3. Some scientists believe that the human penis evolved its shape as a way to scoop out the semen of other men from a woman's vagina.

September 11, 2014:

There are three types of accessory sex glands in males. Not all species have them but men are lucky enough to have all three!

1. Seminal vesicles (2) produce the bulk of the seminal fluid and fructose for sperm metabolism. Gotta keep those swimmers swimming!
2. The prostate (acquire your own delightfully soft prostate friend in the link below) produces buffer fluid (alkaline or basic) and is responsible for the characteristic smell of semen.
3. The bulbourethral glands (2) also produce alkaline buffer fluid.

Why might it be important for glands in the male to secrete buffer fluid?

<http://iheartguts.com/products/prostate-plush>

Week 2: Female Reproduction

September 16, 2014:

Thanks to the participant who sent in a question about the clitoris! The question is - Is the clitoris necessary? Could a woman function without one?

The clitoris is a pretty fascinating organ because its sole purpose is sexual pleasure. It is the only organ known to have this sole purpose. If a woman did not have a clitoris (for example, clitorrectomy - the removal of part/all of the organ) her sexual function will be impaired significantly. Clitorrectomy in particular, a horrible practice still alive in some countries, can also affect urination and child birth if performed in non-sterile environments or by an unpracticed physician.

In many cases, clitoral stimulation is the main determining factor in whether a woman can reach orgasm. The clitoris itself has 8000 nerve endings (more than 4 x the amount in the head of the penis) making it extremely sensitive. The conclusion to all of this is that yes, a woman could function and live without a clitoris. Would she want to? Well, probably not!

September 19, 2014:

Hey all - I found this silly cartoon about menstruation. I thought it might be fun to discuss what might be accurate and inaccurate about it. While we haven't talked about the cycle yet, see if you can figure out what might be inaccurate about the process and post your ideas!

<https://www.youtube.com/watch?v=ZvPVyas68jE>

Week 3: Birth Control and Contraceptives

September 22, 2014:

Fun explanation about some barrier methods such as the female and male condom. Condoms are types of CONTRAceptives (remember our three types) meaning that they prevent fertilization by preventing the sperm from ever reaching the egg.

https://www.youtube.com/watch?v=7TAUIZ_CEs4&list=UUkxMIA7rt-mnIc1AjbyAsPw

September 24, 2014:

How do birth control pills work? There are two major players! The hormones that are included in combination birth control pills are progestin (a synthetic version of progesterone) and estrogen. Other birth control pills may only include progestins and no estrogens. Still other pills may have progressively increasing dosages of hormone throughout the month. The idea is that by keeping levels of these hormones higher than normal, it will interfere with a woman's natural cycle and keep her body from having the conditions necessary for getting pregnant.

Under normal circumstances, a woman goes through two major phases in her cycle. From the time of her period until the time that she is getting ready to ovulate, her body is under the influence of estrogen. She is most fertile when estrogen is at its peak around ovulation time. From ovulation (about halfway between periods) through her next period, she is under the influence of progesterone. Keeping these hormones high with a birth control pill can keep a woman from ovulating among other things (see previous post about ways birth control can affect the body).

Here's some info from Planned Parenthood about the birth control pill. The video is a good snapshot.

<http://www.plannedparenthood.org/.../birth.../birth-control-pill>

Week 4: Fertility and Pregnancy

October 1, 2014:

Weird fact - there is actually a study showing that in a study of 1800 unmarried young adults between the ages of 18 and 29, 19% of women and 13% of men believed that they may be infertile. While in some instances this may be true, these ideas were not all based on medically accurate knowledge (for example some of them based their idea on having one instance of unprotected sex with no pregnancy resulting). The problem with the belief that one is infertile can lead to improper birth control use or lack of birth control use. Remember the criteria for the label "infertile" and don't automatically assume that you are! Safe sex is always the answer!

October 4, 2014:

In this diagram you can see the full chart showing the hormone shifts, the structures that appear on the ovary, and the build up of the uterine lining during the menstrual cycle. It sums up so much that we have learned so far! While we have not discussed every hormone or every structure on the ovary, please feel free to send in questions if you'd like some more clarification.

http://www.sportsmd.com/Portals%5C0%5Caltman2%5CMenstrual_cycle.jpg

Week 5: Sexually Transmitted Infections

October 7, 2014:

Human Papilloma Virus or HPV

What is it? HPV is the most common STI in the United States. New statistics state that 70% of sexually active people will contract HPV in their lifetimes. HPV is spread through vaginal, anal, and oral sexual contact, and can occur whether or not the infected person has any symptoms. While most people with HPV will not show signs, some will have warts or bumps in the genital area. These will normally go away on their own with time.

What are the risks? There are two types of HPV - low risk and high risk. Low risk HPV does not increase the chances of having any kind of cancer. High risk HPV can increase the chances of having cervical cancer in women. It can also increase the chances of having penile/anal cancers or head and neck cancers in men.

What can I do?

1. Women - stay up to date with your pap smears (an abnormal pap can show HPV) and gynecologist appointments. Men - unfortunately, there is no good way to screen men for HPV at this time. It is recommended that men should be aware of anything unusual and go to a doctor if they notice any strange bumps or warts.
2. Vaccination - Both men and women can get vaccinated for HPV. However, they need to do so through the age of 21 for men and age 26 for women.
3. Condoms - Using condoms correctly every time can drastically reduce the spread of HPV although it may not completely eliminate the chances due to possible contact with the scrotum.

<http://www.cdc.gov/std/hpv/stdfact-hpv.htm>

October 10, 2014:

Another big viral STI, herpes, has been covered by Lindsey Doe - the Sexplanations girl that has made many appearances already on this page. Herpes is best known for the visible, painful sores that it causes during outbreaks (although like many of the STIs already covered, it does not always cause them). In someone who does have outbreaks of sores, there are periods of dormancy before the sores may appear again.

https://www.youtube.com/watch?v=7_GgHfcRfI

Week 6: Healthy Sexual Relationships

October 13, 2014:

This website is about a campaign is geared towards consent, which was the original topic for today. Again, consent is the key to healthy relationships. Clear cut "yes" or "no" is incredibly important to avoid blurring lines and having misunderstandings. Our culture doesn't like to talk about sex much. Why do you think that is? It's up to us to change that and keep the conversation open!

<http://www.consentissexy.net/consent>

October 16, 2014:

What was your sex education experience like? One of the reasons that sex may be less discussed in our culture also has to do with sex education. Time just released an article about parents and having the "sex talk" with their kids. Other modes of sex education include sex education through schools (which can be abstinence only or comprehensive with information on contraceptives and other birth control methods). Sex education is not well regulated in many states in this country which contributes to the problem.

<http://time.com/.../parents-teens-sex-talk-smart-phones-inte.../>

Week 7: Participants' Choice (Strange Animal Mating Habits and Contraceptive Myths)

October 20, 2014:

Did you know that cats have barbed penises (the male ones at least)?? Ouch! Cats are induced ovulators meaning that when the female is in heat, she will not ovulate until mated by the male. The barbs on the male's penis help to stimulate ovulation (the release of an egg to be fertilized). No wonder the pretty girls are so grumpy afterwards!

<https://www.youtube.com/watch?v=3UVw7cgv36A>

October 22, 2014:

To continue on our trend of soda rumors, Coca Cola has also been rumored to be effective as a spermicide. Research was actually done to determine whether this was the case, although much more research was done afterwards showing no efficacy. Using Coke to rinse out your vagina has some other problems that come along with it. First of all, sperm travel pretty quick so many of them may already be into the cervix and the uterus by the time you decide to shake up your soda and douche with it. The other is that the sugars in any soda can cause bacterial growth leading to yeast infections or urinary tract infections. Best to avoid all soda in the case of your genitals!

Appendix E

Category	Focused Code	Definition	Example
Establishment of community through social media	Maintenance of preexisting relationships (19)	Social media are described as a way to maintain contact with friends/family	“Um, I think I’m just like a social person so I like to connect with people like, since I can’t see everyone like now since I’m at college. It’s like a good way to connect with people that aren’t here with me. Yeah.”
	Pressure to stay connected through Facebook (11)	Facebook is described as something that “everyone has” or as something that is necessary in order to maintain contact with others	“Yeah, it was like, like a “do it or don’t” like if you didn’t do it, then you were out of it and you weren’t connected with those people so it’s like you had to make one to be connected with those people.”
	Membership in multiple communities (7)	Other social media connections/involvement are mentioned that may be outside of friend/family relationships (groups/organizations/classes)	“Yeah like I don’t think I’ve had anything terrible happen on social media like some of the groups I’m a part of, um, you know if it’s like a hobby like reptiles or something, you know someone will post a picture on the group and say, ‘Oh, can you identify this reptile?’”
	Group coordination (11)	Social media are discussed as a way to coordinate groups of people (events, gatherings, organizations, causes)	“And then we have like the leadership community page that we like post about and we also have like there, at one point they tried to make like a study group for like different tests, they’ll like post in the Facebook group you know, ‘Is anybody taking this test? Or like in this class? Would you wanna study together?’ And then like they make a group so then they can plan out when to study like on Facebook. So that’s like, I think it’s more connecting with like classmates and peers that you could like, work with.”
	Participation builds community (11)	Participation through posting, commenting, “liking,” etc. is discussed as a way that communities are built through social media	“I know like one group I’m part of, it’s a sailfin dragon group and that one’s a friendly group not an arrogant one so people will post things I mean it’s neat because, um, the lizards are over in Indonesia so we have people from Indonesia and the Philippines and all over the place and like, helping each other out like they’ll post a question about the care of the animal and everybody’s helping out to um, you know offer advice and I dunno I just think it’s kinda cool.”
Student support for academic social	Familiarity with social media (8)	The benefit of social media is that people are familiar with	“I think it’s like a pretty modern take and like everyone’s like into it, it’s like, some professors are like, ‘Take out your

media use		using it	phone, and go to this and check this out.' It's like well everyone basically has a phone so it's like ready for you and it's like you're doing it yourself so it's like you're not getting bored just by listening to the teacher or something."
	Informal learning via social media resources (19)	Participant discusses having learned something while browsing social media (from news, articles, commentary, etc.)	"Yeah I like Facebook's um, well cause it has all of that stuff that you can do with your friends and family but like if you have five minutes in between class, I like that they have news, current news now too. So, instead of having to get onto Google and try to find something about current news, like they list the current news as well so, it just seems relevant to a lot of what's going on."
	Preference for Facebook (10)	Expression of preference for Facebook over other social media sites or formats	"Um, I used to have Twitter, but like, I don't think that was like the best way for me to like actually connect with people? So I just like deleted that one and like I like Facebook a lot just cause I think it's, a lot like, I don't know, friendlier?"
	Openness to social media integration into courses (5)	Participant expresses that they would like to see social media integrated into academic settings	"Like, education's a part of your life too and like at this point, like I feel like education does like invade into your normal, like your recreational life like already. So I feel like that would just be like more convenient, like I feel like it's already invading it so I feel like the social media aspect, adding that into it's not making that big of a difference."
Recommendations for integration of Facebook into academia	Use of visual media (18)	Participant expresses enjoyment for visual media such as photos, video, etc.	"That's kinda the reason I like Facebook it's you get like, a mix of those two. Like you'll see peoples' pictures and you'll see what they're talking about and then you can talk to them. It's just kinda, it's easy, like, videos on there too I really like it."
	Responsiveness of instructors/TAs (5)	Participant expresses appreciation for the timely responses/feedback of instructors/TAs	"Yeah I think having people managing the site that are knowledgeable either TAs or the professors and be very responsive so someone asks a question, they get an answer to it in a good amount of time cause if it, you know if you ask a question about your homework tonight that's due in a couple days and nobody gets back to you then it loses its value cause you can't actually use it while you're working so, I think responsiveness with people running it."
	Presence of filtering/monitoring (3)	Participant discusses the need for the social media instructor or administrator to filter and monitor post content	"So if it's an educational group I like the idea of it being, you can search the headline, administer adds you, and then you may or may not be able to post certain things but you can be there to you know, view what's being showed by people who are informed about the topic."
	Instructor conveys	Participant expresses	"There's actually one thing I really like is when, is when one

	personality (8)	appreciation for excitement, friendliness, or approachability of the instructor	of them will, you can just tell that they're really excited about the material and like they just love their jobs? So, it's like 'oh yes, my absolute favorite thing are you ready?' kind of thing and you can just like, they don't necessarily say that but you can just kinda hear it in their voice that they're, 'Isn't this great?'"
Challenges of Facebook use for academia	Inappropriate social media use (17)	Discussion of negative commentary or the creation of a negative environment by people inappropriately using social media	"Yeah and sometimes it's like, a lot of like angry? You know like, subtweets? Like you know, so it's like talking about other people, like that was just like a really negative time. So, I didn't really like that."
	Distraction from academic tasks (11)	Discussion of social media as something that distracts students from their work	"Cons would be, like it's a time waster you know instead of like sitting there quietly for ten minutes thinking to yourself or thinking about your homework you're sitting there flipping through peoples' newsfeed or clicking on news like it, I think it distracts you from other things."
	Need for meaningful interactions (8)	Participant discusses the need for better interactions between instructors and students through social media (more than simply "announcements")	"I actually do have one I forgot it was like a page for (organization) it's one of the living and learning communities but like, it's usually, announcements are usually through emails and stuff like that and the Facebook page was just for like um, pictures or something that we took from like an event so it's not really like useful, it's just kinda there."
	Post lengths and frequencies limit content (9)	Participant discusses how posts that are too long or too frequent may discourage them from investigating material	"This's the difficult part about like Facebook and stuff is, because you're used to seeing the shorter stuff? So someone posts an article you're like 'Oh! Oh, this is more than a paragraph. Oh ok.'"
Facebook for sexual health education	Preference for higher group privacy (3)	Participant expresses appreciation for having higher privacy settings for groups dealing with sexual health	"Well cause it is anonymous you know if anybody is, hasn't learned about it before or is too shy you know or whatever they have the ability to learn about it and ask questions where they might not have been able to do that in person with either friends, family, you know whoever. So, I think it gave people freedom to find out about things that they might not have been able to find out about before."
	Sensitive topic material discouraged	Participant suggests that the nature of the information	"Feel like the only drawback could be if somebody felt uncomfortable about those topics and they were like going to Facebook for like leisure activities or like social aspects but

	participation (5)	presented may have resulted in less discussion/participation	then that was like one of the notifications or that made them uncomfortable?"
	Maintain educational environment (3)	Participant expresses appreciation for an educational environment for learning about sexual health	"Yeah it was like it was educational too it wasn't like you know you go on some groups and it's just about whatever and everyone's just throwing their opinions around and you know you go to the group to throw your opinions around. This you go there to learn and you may not know much about the topic so you're just kind of absorbing you know, what um you know, what you're getting cause they're the ones who are informed about the topic."
	Insufficient past experience with sex education (20)	Participant discusses need for sexual health education, problems with past sex education experience	"Yeah they like pulled us out and made us watch a video. It was like a 20 minute video and I was very confused because I was like, in middle school. And they were just like, 'Oh you have to watch a video today instead of going to gym.' And we were like, 'Ok?' And then like nobody really paid attention to it and that was the extent of anything we had. Like any education."
Participation patterns through Facebook	Strong reaction sparks participation (3)	Participant explains that having a strong emotional reaction or finding something humorous inspires participation through comments or "likes"	"Yeah I don't really, like actually post anything really? Even like on normal Facebook like, I occasionally like something but most of the time I just like taking information so I think it takes a lot for me to like comment, like a strong emotion about something there or like just a strong interest? But like most of the time I don't post ever so."
	Obligation sparks participation (2)	Participant felt obligated to investigate materials due to involvement with study	"So it was like a research for your thing so I felt obligated to read everything so I just read everything cause I felt guilty if I didn't for some reason?"
	Lurking (7)	Participant talks about viewing materials, but not contributing to commentary or "liking" posts	"I would usually check it at like the end of the day because most of the time like in free time that's usually like when I had time to sit down and look at it and I just read most of the stuff like I clicked on it. I didn't really interact I don't really know why but like it was more just me like reading it or like looking at the diagrams I didn't really comment or anything."
	Participation affected by scheduling and workload (6)	Participation varied due to increasing workload and busy schedules throughout the semester	"Yeah I mean I commented a couple times or if I caught a poll in time I'd try to answer the poll um, it just depends I would try to check it like once a day. If I had a lot of homework or something sometimes it was every other day or a couple times

			a week. Um..."
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