EDUCATIONAL SOCIAL SOFTWARE: THE USE OF SOCIAL NETWORK

SITES FOR TEACHING AND LEARNING

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The Supervisory Committee certifies that this ***disquisition*** complies
with North Dakota State University's regulations and meets the accepted
standards for the degree of

DOCTOR OF PHILOSOPHY

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ABSTRACT

Although social network sites (SNS) are in use by millions worldwide, the deployment of such sites as tools for teaching and learning is new. Topics related to the ways, means, and outcomes of SNS use in education and training contexts constitute a fresh research area within the field of educational technology. This mixed-methods research project gathered information regarding the use of SNS in education and training settings. Respondents to an Internet survey showed familiarity with a range of social media software, and several had used social network sites including Facebook, Ning, and MySpace in their professional practices. Respondents identified these sites as offering support for communication and community building, and rated this affordance as the most useful aspect of SNS for use in educational settings. Privacy control settings were the individual SNS feature identified as most important in the educational use of SNS. Personal publishing, content creation, and multimedia display functions were also rated as important. Respondents supported the utility of social network sites for use in the delivery of education. Themes expressed in the data regarding participant views of the use and importance of various features of educational social software indicated apparent acceptance of SNS-type tools as potential agents of paradigmatic change (as per Kuhn, 1996) in educational domains. Respondents made substantial commitments to working toward support of a new paradigm shaped by the use of SNS and social media tools.

ACKNOWLEDGMENTS

DEDICATION

This work and all my other efforts in life are dedicated to my wife ShinJa LeNoue, and

my sons Honor and Alan. They make everything possible.

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CHAPTER 1. INTRODUCTION

New Tools and New Schools

A common theme in the literature and punditry on technology-enhanced

education delivery is description of a future where all education is supported by

networked digital technologies. Brick-and-mortar schools become increasingly rare,

replaced by server banks and education clouds, as students use front-end software to

access a vast, decentralized array of courses, instructors, and resources. The outlines of

this vision are solidifying right now as technology removes traditional institutional

barriers and channels that have served to manage and limit access to knowledge. Control

is being placed in the hands of students. Rapid growth in the use of Internet-capable

hand-held devices, used in combination with social media software, is empowering

today's students with the ability to create information-rich environments that are freely

available and structured around friendships and community affiliations rather than

institutional prerogatives (R. Yanosky, forward, in Smith & Caruso, 2010). "Students use

computers, mobile devices, and the Internet to create their own engaging learning

experiences outside school and after school hours – experiences that too often are

radically different from what they are exposed to in school" (U.S. Department of

Education [USDE], 2010, p. 4). The availability of Internet access and the changing

nature of the World Wide Web are transforming learning contexts as connectivity in

schools, homes, neighborhoods, and communities becomes increasingly pervasive

(Greenhow, Robelia, & Hughes, 2009).

A primary contextual component and driver of this transformation is the

worldwide crisis that is building momentum under the impetus of environmental decline,

climate change, resource scarcity, social disruption, and shifting global political and economic power relationships. The end of the Petroleum Age (Goodstein, 2004; Simmons, 2005) will manifest in an ongoing crumbling of infrastructure and reduction in state-sponsored services. For societies in developed countries, everyday life will decrease in complexity, and increasingly play out in relatively self-sufficient, nuclear, civic communities (Kunstler, 2005). This long decline is associated with the end of the infinite growth paradigm that has been the basis for modern capitalist economic activity. Under the effects of economic and cultural change, long-emplaced social systems and structures are either disappearing or changing dramatically. The Western system of schooling, with its reflection of the mechanistic worldview of the industrial age and similarly high degree of efficiency and success, is one such locus of change. In a contextual frame absolutely defined by the physical limits of the planet, there is an emerging struggle to build and emplace models of schooling that can satisfy exponentially increasing demand with rapidly diminishing resources.

The open education movement (OEM) is one clear example of the type of change that is underway. The OEM is a grassroots phenomenon that promises to fundamentally change the way authors, instructors, and students interact worldwide (Baraniuk, 2006). It is based on the following principles:

- knowledge should be free and open to use and re-use;
- collaboration should be easier, not harder;
- people should receive credit and kudos for contributing to education and research;
- and concepts and ideas are linked in unusual and surprising ways and not the simple linear forms that textbooks present (Baraniuk, 2006, para. 1).

The OEM began in 1999 when the University of Tübingen in Germany published lecture videos online, then gained momentum in 2002 when MIT launched the MIT OpenCourseWare project. This lead was quickly followed by other universities including the Beijing Jiaotong University and several other Chinese universities, and the Tokyo Institute of Technology in Japan. The amount of content available online increased rapidly, as did the variety of means for accessing, remixing, and repurposing course materials (Brown, 2008).

The mega-university is another revolutionary concept that has developed in the face of a supply-side crisis as populations in developing countries explode with young, ambitious citizens. The mega university concept has its roots in the work of Harold Wilson, Prime Minister of the UK in 1964, and Dr. Walter Perry, Vice Chancellor and Head of the Open University. Wilson's development of the Open University was founded on the premise that electronic communications technology could be used to make quality higher education more accessible (Daniel, 2003). In Daniel's original terminology, a mega-university was an institution with a primary mission of teaching at a distance, and a simultaneous enrollment of over 100,000 students in degree-level programs (Daniel, 1996, 2003).

In 1995, eleven institutions met Daniel's criteria: the China TV University system; the Centre National d'Enseignement à Distance in France; Spain's Universidad Nacional de Educación a Distancia (UNED); the University of South Africa (UNISA); the Korea National Open University; Indonesia's Universitas Terbuka; the UK Open University; India's Indira Gandhi National Open University; Payame Noor University in Iran; Thailand's Sukhothai Thammathirat Open University, and Turkey's Anadolu University

(Daniel, 2003). In 2003, Daniel remarked that the number had likely grown over the intervening years since 1995, but it had also become more difficult to apply his original criteria as institutions increasingly blended approaches to learning delivery. According to Wikipedia ("List", n.d.), there are at least four open universities today that have enrollment in the millions: Indira Gandhi National Open University (India, 3.5 mil.), Allam Iqbal Open University (Pakistan, 1.8 mil.), Islamic Azad University (Iran, 1.5 mil.), and Anadolu University (Turkey, 1 mil.).

Educational innovation is empowered by the affordances of the digital age, and digitally-mediated learning delivery supports the ongoing success of the OEM and Open Universities in the mission of providing large-scale access to educational opportunity.

> In the digital age, communities self-organize around the Internet, which has created a global 'platform' that has vastly expanded access to all sorts of resources including formal and informal educational materials. The Internet has also fostered a new culture of sharing, one in which content is freely contributed and distributed with few restrictions. (Brown, 2008, p. xi)

High connectivity and ubiquitous computer processing power are beginning to drive demand-driven learning and a vision of pedagogy that (a) includes learners as active participants or co-producers rather than passive consumers of content, (b) frames learning as a participatory, social process intended to support personal life goals and needs, and (c) places opportunities for true life-long learning within the reach of more people than ever before (McLoughlin & Lee, 2007).

Iiyoshi and Kumar comment on a "confluence of events…creating the perfect storm for significantly advancing education" (2008, p. 2). They see transformative

opportunities for education in a proliferation of new initiatives with the potential to radically change the ecology and the economics of education, and a growing inventory of educational tools and resources openly available to an increasingly engaged and connected community. Education as a concept and a social institution is at the beginning of what will be a comprehensive transformation. In 2006, Anderson noted that:

> The digital age promises great change for educational institutions. A small niche market will continue for institutions focused on that subset of learners who can afford and are willing to restrict their freedom by attending campus based programs. However, for the majority of lifelong learners, learning opportunities that do not restrict learner freedom are increasingly attractive. Those institutions that are flexible and innovative enough to meet the demanding needs of these new learners will prosper in the digital age. Those that are not as adaptable will be left fighting each other for a shrinking population of traditional learners. (p. 88)

Perhaps the greatest potential embodied within the paradigm of networked digitally-mediated education is the fact that this form of teaching and learning can leverage the Internet to offer equitable, inexpensive access to nearly limitless resources. It also presents extreme difficulties for those who might wish to control what is being taught and learned, making this an ideal method for the delivery of pedagogies of freedom and democracy. Applied to educational purposes, new digital communication tools and technologies offer possibilities for the creation of an educational system that can prepare people from all localities to participate in the post-global economy rather than being exploited by it. As has been demonstrated by the synergy of digital communication technology and political indignation and activism in populist uprisings

across the Middle East and North Africa region, the networked digital spaces outlined by social media are particularly fertile ground for making connections, building communities, and fomenting revolutions (Afary & Anderson, 2009).

Living Wired

The number of people worldwide who have Internet access is growing (Gartner, 2009; Organization for Economic Co-Operation and Development [OECD], 2010; Rideout, Foehr, & Roberts, 2010). In the United States, the most recent findings published by the Pew Research Internet & American Life Project indicate that 79% of American adults age 18 and over go online, with the number rising to 95% for the millennial generation ages 18-33. In addition, a majority of American teenagers (93% of those aged 12-17) also use the Internet (Pew Internet and American Life Project, 2009). Two-thirds of U.S. adults (66%) currently have a broadband Internet connection at home, including approximately 81% of millenials (ages 18-33) and 73% of Gen X adults ages 34 to 45 (Zickuhr, 2010). Among young people ages 8-18, home Internet access has expanded from 74% to 84% in the last five years, and the quality of Internet access has improved as well, with high-speed access increasing from 31% to 59% (Rideout et al., 2010).

Broadband Internet penetration figures for the developed countries are the subject of much argument, speculation, and manipulation according to whose metrics and interests are in play (Anderson & Rainie, 2010). Figures derived by dividing subscriber numbers by total population, as in the OECD statistics presented in Table 1, showed the Netherlands in the lead, with a penetration rate of just over 38 % (OECD, 2010). Other sources such as the September, 2009 Gartner report "Next Phase of Growth in Worldwide

Table 1

OECD Fixed (Wired) Broadband Subscriptions per 100 Inhabitants, Dec. 2010

Rank	Country	Subscriptions per 100 inhabitants
1	Netherlands	38.09
2	Switzerland	38.07
3	Denmark	37.74
4	Norway	34.65
5	Korea	34.04
6	France	33.66
7	Iceland	33.65
8	Luxembourg	33.47
9	United Kingdom	31.94
10	Germany	31.93
11	Sweden	31.85
12	Belgium	30.85
13	Canada	30.72
14	Finland	28.58
15	United States	27.74
16	Japan	26.74
17	New Zealand	24.93
18	Australia	24.10
19	Israel	24.03
20	Austria	23.89
21	Slovenia	23.79
22	Spain	23.36
23	Estonia	23.30
24	Italy	22.07
25	Ireland	21.05
26	Greece	19.87
27	Portugal	19.84
28	Hungary	19.56
29	Czech Republic	14.67
30	Poland	14.20
31	Slovak Republic	12.79
32	Mexico	10.45
33	Chile	10.40
34	Turkey	9.77

Note. Adapted from "Fixed and wireless broadband subscriptions per 100 inhabitants" by OECD, 2010.

Consumer Fixed Broadband" applied a household metric that allowed for multiple users

of one subscription (Sabia, 2009). This generated a broadband penetration rate of at least

48% for the 22 countries surveyed (See Table 2), and a U.S. adoption rate of 60%.

Table 2

Household Broadband Penetration by Market (Percent)

Country	2008	Country	2013
South Korea	86	South Korea	93
Netherlands	80	Netherlands	88
Denmark	75	Canada	81
Hong Kong	72	Hong Kong	80
Canada	69	Singapore	78
Switzerland	69	Denmark	78
Norway	67	United States	78
New Zealand	65	New Zealand	75
France	63	Japan	73
Singapore	63	Taiwan	72
United Kingdom	63	Norway	72
Finland	62	United Kingdom	71
Taiwan	61	Switzerland	70
United States	60	Australia	69
Belgium	58	Germany	66
Japan	57	France	65
Spain	56	Belgium	63
Germany	55	Ireland	63
Australia	55	Spain	62
Sweden	54	Finland	59
Ireland	54	Austria	54
Austria	48	Sweden	54

Note. Adapted from "Gartner says one in five households worldwide will have a fixed broadband connection by end of 2009" by Gartner Inc., 2009.

Whichever metrics are applied, it is clear that the number of households with broadband Internet connections continues to grow robustly. Worldwide, one in five households now have a fixed home broadband connection, and nearly 580 million are expected to be connected by 2013 (Gartner, 2009). In the US, it is estimated that 90% of the population will be online with dramatically faster connections by 2014, with all media streaming in and out of the home or office via the Internet, and computers replacing television sets in the home (Rainie, Fox, & Anderson, 2005).

Along with the spread of broadband-wired homes, the percentage of American public schools connected to the Internet had already reached nearly 100% by fall of 2005

(Wells & Lewis, 2006). According to the National Center for Education Statistics, 97% of public schools with Internet access were using broadband connections, and Internet access was available in 94% of the instructional rooms (Wells & Lewis, 2006). Similar increases in school connectivity are likely to be seen across the world in both developed and developing countries as countries work on formulating and implementing national broadband connectivity plans ("National broadband plans," n.d.). The networked citizen becomes the networked learner, and this opens the way for new conceptions of teaching and learning (Greenhow et al., 2009; Siemens, 2006b). In regions of the world where sufficient development and access to resources are available, many students are wired 24 hours a day with laptop computers and mobile devices. Content is readily available from a variety of sources online, and much of it is free of charge.

> Students of today, growing up in the Information Age, have a vast world of knowledge available at their fingertips: If they learn something of interest in school, they know they can find out more about the topic in just a few clicks. (Nastu, 2010, para. 2)

Coincident with the expansion in connectivity, the nature of the Web has also changed (Alexander, 2006; Cormode & Krishnamurthy, 2008; Greenhow et al., 2009; McLoughlin & Lee, 2007). The first-generation web, or Web 1.0, primarily consisted of hierarchically structured websites delivering information controlled by a small group of content providers. This early web was seen as a source of information or a content-delivery system that was similar to traditional media such as books and visual media (Cormode & Krishnamurthy, 2008). Although individuals capable of working in hypertext markup language (HTML) could contribute to online content, most users

simply browsed and read to obtain information, with content creation and sharing limited to text-based online forums, list-serves, and multi-user dungeons (Cormode & Krishnamurthy, 2008; Downes, 2005a).

Recent technological advances have resulted in a changed online experience that is often referred to as "Web 2.0". Web 2.0 is a term coined around 1999 to describe the second-generation Internet experience (DiNucci, 1999; O'Reilly, 2005), which revolves around technological features that maximize the potential for content creation and allow any Internet user to connect, communicate, create, and contribute in the online environment (Alexander, 2006; Cormode & Krishnamurthy, 2008; McLoughlin & Lee, 2007). The Web 2.0 phenomenon has opened up a vast new realm of Internet user participation and interaction, making the Internet interesting and attractive to large numbers of new users, facilitating collaborative and distributed online practices, democratizing the content of the World Wide Web, and offering new possibilities for digitally-mediated learning delivery.

Background of the Study

As connectivity in schools, homes, neighborhoods, and communities becomes increasingly pervasive, the changing nature of the World Wide Web and the hybrid learning spaces those changes enable are transforming the foundational principles that shape our definitions of knowledge and education (Anderson, 2004, 2006; Bonk, 2009; Greenhow et al., 2009; Siemens, 2006b). In addition, the rapid pace of change in modern life, the massive amount of information that must be employed to deal with daily tasks, and the increasingly short half-life of knowledge are factors that combine to force people to learn differently than they did in the past (Greenhow et al.; Nastu, 2010; Rovai, Ponton

& Baker, 2008; Siemens, 2006a, 2006b).

Siemens (2004b) proposed a conceptual framework for emerging models of knowledge, education, and learning theory: Connectivism. The connectivist paradigm takes knowledge out of the centralized, linear-delivery model that our current educational system is based on, and places it within a network (Siemens, 2006a, 2006b; Siemens & Downes, 2008). The basis of connectivism is the concept of some portions of knowledge existing as separate entities, external to the individual, and residing within a network. Learning involves locating the institutional, social, and individual nodes where relevant information is reposited, and engaging in constant network building with an attendant increasing and sharing of knowledge (Siemens, 2004b, 2006a, 2006b; Siemens and Downes, 2008). Older models of education focused on the transmission of bodies of stored knowledge from centralized data bases to learners, who were effectively charged with storing copies of that knowledge. In contrast, for learners in the information-flooded environment of the digital age, the ability to memorize or store information may be regarded as reduced in importance relative to skill at building the networks that enable one to locate, assess, and synthesize material (Nastu, 2010; Siemens, 2004b).

Discussions around the topic of connectivism have served to critique connectivism as a possible new learning theory, incite dialogue on how learning has changed with recent advances in networked digital technology, and explore the implications of these changes for educators and instructional designers (Downes, 2005b; Kop & Hill, 2008; Siemens, 2006a; Verhagen, 2006). Connectivism as an emergent conceptual model fitted to the description of knowledge and learning as they now appear in the digital environment has brought long-standing theories of learning into question.

Likewise, the use of networked digital communication hardware has altered foundational conceptions of schooling as face-to-face and distance learning models blur together and the footprint of the resulting hybrid expands within education systems worldwide (Anderson, 2008; Bates, 2008).

Now, the digital toolbox comprised by social software is arising as a third structural member that can interlock with both the evolving digital hardware and the wetware that is the human cognitive system to render a powerful whole (Anderson, 2005a, 2006; Dalsgaard, 2006). Variously termed as social media, social software, or social networking software, it greatly facilitates digitally-mediated interaction among people and offers the networked world and its citizens affordances ranging from new economic models based on sharing and collaborative development to widely distributed educational communities evolved in both global and local initiatives (Anderson, 2006; boyd, 2008; McLoughlin & Lee, 2007; Shirky, 2003). Educational content management and delivery systems that include features inspired by commercial social software are increasingly becoming the public face of education, upgrading the traditional schoolhouse meme to a digital electronic construct (Bonk, 2009; Bonk, Kim, & Zeng, 2005).

Social software is constituted by new generations of Internet applications that support conversational interaction, creation, contribution, and collaboration by individuals using computer technology linked by broadband networks (Anderson, 2008; boyd, 2007; Shirky, 2003). This type of software has proven to be very popular with the general population, and young people in particular; although it is still relatively new technology, various forms of social media are already in use by hundreds of millions of people across the globe. Social media offers numerous affordances that are attractive to

educators working in technology-enhanced environments, and teachers have been experimenting with social media tools as fast as they have appeared on the scene. In fact, almost every social networking tool that has gained general popularity has been appropriated for some form of educational use (Johnson, Levine, & Smith, 2009).

Social software tools enable a different way of using the web within an educational context. The use of social software applications in online education delivery encourages collaboration, while supporting self-direction and individuation (Dalsgaard, 2006). In contrast to standard content management systems, which are teacher/institution centric and emphasize content handling and two-way communication, social software offers far more interactivity and a distributed web of communication paths (Siemens, 2004a). In this way, social software fosters interaction, community feeling, and group motivation (Dalsgaard, 2006). Connection and dialogue are supported, offering the potential for transformation and enabling the possibility of lifelong competence development (Marenzi, Demidova, Nejdl, Olmedilla, & Zerr, 2008). By offering rich support for communities of access, interaction, learning, and collaboration, social software operating on modern 3- and 4-G networks can allow teachers and students to do anything that can be done in a brick-and-mortar classroom (Rajasingham, 2008).

The most popular type of social software worldwide is the social network site (Nielsen Company, 2009; Wauters, 2011). boyd & Ellison (2007) define social network sites as web-based services that allow individuals to (a) construct a public or semi-public profile within a bounded system, (b) articulate a list (network) of other users with whom they share a connection, and (c) view and traverse their list of connections and those made by others within the system. In considering these sites, many people inaccurately

conflate social networks with social networking. While SNS users may be able meet strangers and make connections that would not have been made otherwise, this networking function is not the primary feature of these sites. The unique aspect of an SNS is that it allows users to articulate and make visible their social networks (boyd & Ellison, 2007). This may be an important and useful feature in some educational contexts, while receding in importance in others. For example, in educational SNS use, the value of network articulation may give way to the utility of other common features of SNS such as (a) the hosting of customizable personal profile pages that support the establishment and maintenance of individual presence in the online learning environment, and (b) the provision of a collected suite of varied social software tools.

Facebook and other social network sites are being adopted for use in educational environments as educators explore possible applications of SNS to instruction, communication, marketing, student retention and engagement, faculty development, and other purposes (Schwartz, 2009; Terris, 2009). For the classroom, a well-designed instance of educational SNS, or educational social software (ESS - Anderson, 2005a) can offer multi-modal and multi-media communication and content delivery capabilities and provide a virtual space where course participants can meet and take part in various formal and informal interactions centered on shared learning objectives. This social space can be a positive component of an online course (Palloff & Pratt, 2003), and can encourage the development of the object-centered social structures (Engstrom, 2005) that arise naturally around the content, activities, and learning objectives that constitute commonalities shared by course participants.

Statement of the Problem

Social network site use is a world-wide phenomenon, and it is generally accepted that the use of these sites is now a near-universal factor in the lives of young people (Smith & Caruso, 2010). As of September, 2009, 73% of online American teens ages 12 to 17 had used an online social network website (Lenhart, Purcell, Smith, & Zickuhr, 2010), while 83% of 18-29 year-olds were using SNS by the spring of 2011 (Madden, & Zickuhr, 2011). Over the past four years, a nearly consistent 95% of 18- and 19-year-old respondents in the ECAR study of undergraduate students and information technology use have reported using SNSs (Smith & Caruso, 2010). There has also been a steady increase in the use of these sites by students aged 25 and older (Smith & Caruso, 2010).

Social network sites serve as important informal educational resources for students by engaging them in a range of complex literacy tasks, facilitating social learning functions, and providing a venue where students can seek peer support and help with school-related tasks from current and former classmates (Greenhow & Robelia, 2009). Majorities of student users of all ages report that education, and schoolwork specifically, are two of the most common topics of conversation on social network sites (Greenhow & Robelia, 2009; Greenhow, Robelia, & Kim, 2008; National School Boards Association [NSBA], 2007; Smith & Caruso, 2010).

Smith and Caruso report that "Because today's high school and college-age students have been adopting social networking and content sharing at such high rates, higher education has an opportunity to leverage these technologies" (2010, p. 78). Social network sites have the potential to be useful in a wide variety of education and training contexts. They can offer learners access to educational experiences based around active

participation rather than passive reception, and contribute to sound pedagogical

approaches (Bedard, 2009; Dalsgaard, 2006; Dron, 2006; Ferdig, 2007; Fitzgerald, et al.,

2009; Martin & Crawford, 2008; Selwyn & Grant, 2009). A survey by Thomson

Learning (Cengage Learning, 2007) revealed that nearly 50% of faculty respondents who

were familiar with SNS felt that such sites can change the way students learn. However,

these sites have only recently begun to be seriously contemplated for inclusion in

academia as teaching and learning tools (Vie, 2008).

One theme immediately stands out in the existing literature regarding social

network sites and education: the term "social networking" is stigmatized to a degree that

may interfere with the effective use of these sites and other Web 2.0 tools in educational

contexts (Hargadon, 2009). Investigation of this topic reveals a cautionary bent in the

popular and scholarly literature alike. Even where the subject is SNS use by adult

teachers, the theme is often one of warning and risk for individuals who expose personal

information on social network websites. Warnings against SNS use have been issued to

public school teachers by K-12 administrative authorities in several regions, and school

administrators or teacher professional associations often encourage teachers to shut down

their own MySpace and Facebook sites (Ewbank, Carter, & Foulger, 2008; Saunders,

2008). In some cases, outright threats of termination have been issued ("Teachers

Warned", 2007), and many school districts prohibit any use of social network sites in

school (NSBA, 2007).

There appears to be a strong bias towards viewing SNS usage as inappropriate

and even harmful for young students (boyd, 2008). Discussions about social network sites

and education often center on the challenges these sites pose to (K-12) school districts as

perceived venues for cyber-bullying, harassment, and predation. Educators and parents worry about potentially negative outcomes such as narcissism, gossip, wasted time, hurt feelings, ruined reputations, and unsavory or even dangerous activities that they perceive to be associated with social network site use (Hargadon, 2009). When the possible use of an SNS or other social media for educational purposes is discussed in a positive light, it is often in reference to the potential of these tools as elements of teacher education programs, or as faculty communication tools, rather than for use with general student populations (Bedard, 2009; Ferdig, 2007; Forkosh-Baruch & Hershkovitz, 2012; Hildebrant, 2011; Saunders, 2008; Velasquez, Graham, & McCollum, 2009; Waggoner & Carroll, 2008; West, Wright, Gabbitas, & Graham, 2006). The students themselves see social media differently. Young people are especially avid users of social network sites and it is generally accepted that the use of these sites is now a near-universal factor in the lives of young people (Smith & Caruso, 2010).

Despite the controversy surrounding them, it is clear that social network web sites and their associated social media tools constitute an important cultural phenomenon with wide-ranging impacts on society in general. Personal experiences with Ning social network websites as a component of my own teaching approach, and anecdotal evidence generated within communities of interested educators such as those found at the Ning in Education and Classroom 2.0 web sites indicate that dedicated social network sites are extremely capable and valuable educational tools. They allow teachers to take advantage of both the affordances of current technology and the proclivities of today's learners. This technology is new, and the body of research-based literature regarding the topic of social network site use in education is in early development. Hemmi, Bayne, and Land (2009)

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stated that:

> Much has been written on the emergent modes of communication, meaning-
> making and community formation enabled by 'Web 2.0' within the university (for
> example, Alexander 2006; Anderson 2007), but very little formal research that is
> focused around the application of Web 2.0 technologies in higher education
> pedagogy has as yet been published. The need for such research is pressing. The
> currently dominant modes for e-learning within higher education – those enabled
> by commercial virtual learning environments (VLEs) – are generally failing to
> engage with the rich potential of the digital environment for learning. Their
> tendency is to attempt to render the online learning space familiar through a
> conservative dependence on pre-digital metaphors, signs and practices which are
> increasingly anachronistic as digital modes gain in social and cultural significance.
> (p. 19)

Simonson (2008) notes that it is imperative for distance education researchers to investigate the Web 2.0 concept, and proposes the following taxonomy for study of social network sites:

- Level 1: Learning about social networks: definitions, history, background, and examples.
- Level 2: Designing for social networks: profiling, blogging, wiki-ing, and friending.
- Level 3: Studying social networks: ethics, uses, misuses, policing, supporting.
- Level 4: Learning from and with social networks: social networks for teaching and learning, science, research, and theory building. (p. vii)

There is an obvious demand for scholarly work that can ascertain the truth among the misconceptions and concerns surrounding this technology, and establish more precisely the affordances, benefits, and drawbacks of deploying a social network site as a component of an online or hybrid course.

Purpose of the Study

The purpose of this study was the exploration of instructors' use of social network sites as tools for teaching and learning, the provision of insight into a paradigm shift that is occurring in the realm of digitally-mediated education delivery, and the creation of a conceptual map modeling the use of social network software in support of constructivist learning approaches.

Research Questions

This purpose was accomplished via a mixed-methods (Creswell & Plano-Clark, 2007) study guided by the following research questions:

- What are educators' perceptions regarding the general utility, benefits, and drawbacks of social network sites as educational tools?

- What are the views of concerned experts and classroom teachers experienced with the use of social network sites in their practice in regard to the potential of this technology to engender paradigmatic change in educational domains?

- To what extent do these data enable the development of a model for the use of social network sites in teaching and learning?

Significance of the Study

Social networking and social media constitute an interesting and potentially important phenomenon that education researchers need to investigate (Simonson, 2008).

In the United States, SNS user numbers are growing rapidly. In a recent study produced by the Pew Internet and American Life Project (Madden & Zickuhr, 2011), 79% of all American adults (18+) reported going online, and two-thirds (65%) of these adult Internet users reported the use of social networking sites such as MySpace, Facebook, or LinkedIn. That's more than double the percentage that reported SNS usage in 2008 (29%) and it represented the first time in Pew Internet surveys that over half of all American adults reported using social networking sites (Madden & Zickuhr, 2011). Reported SNS usage was highest among the younger cohort of adult Internet users (ages 18-29), 83% of whom were using SNS by the spring of 2011 (Madden, & Zickuhr, 2011). The pace of increase in the growth of new SNS users has also been dramatic. When Pew first researched adult SNS use in February of 2005, just 8% of Internet users, or 5% of all American adults said they used the sites (Madden & Zickuhr, 2011).

In 2009, a Center for Community College Student Engagement (CCCSE) survey of more than 400,000 community college students from 663 institutions revealed that 64% of traditional-aged students (ages 18 to 24) and 41% of non-traditional-aged students used social networking tools multiple times per day (CCCSE, 2009). Prominent among such tools are social network sites, where participants avail of social media affordances to blog, send messages, and share photos and videos. In the 2010 edition of the Educause Center for Applied Research study of undergraduate students and information technology, 95% of 36,950 18- and 19-year old university undergraduates reported using social network sites for a variety of purposes, with 29% of the respondents using the sites in their university courses (Smith & Caruso, 2010).

In addition to the important functions that SNS serve in the lives of teens as

reported by Greenhow and Robelia (2009), the use of social networking tools in general by college students was found to increase levels of student engagement and feelings of being connected to the college (CCCSE, 2009). However, 43% of younger students and 53% of non-traditional age students reported that their colleges never used these tools to communicate with them (CCCSE, 2009). Leveraging the popularity of social networking tools for educational purposes would appear to be an obvious strategy, and some institutions are using social networking technologies for purposes of marketing and communication about services. Beyond this, the deployment of social media in general and social network sites in particular in educational contexts as an integral part of coursework, or specifically for instructional purposes, is a new practice.

If teachers are to leverage learners' everyday experiences in Web 2.0-enabled contexts in order to increase student engagement in content area learning, researchers need to address the roles teachers and schools can play in modeling and facilitating learning through creative and participatory online practices (Greenhow et al., 2009). Online practices of this sort increasingly center on the use of social network sites and the social media tools associated with them, leading to the implication that social media technologies must have a place in the educational setting. There is a vast range of research opportunities related to SNS use that need to be explored, and a need for consistent and ongoing analysis to establish the groundwork for what is sure to be a very prolific area of investigation (Beer, 2008; boyd & Ellison, 2007). This study constituted a contribution to a new and growing body of literature. Important and practical information was gathered for use by educators who wish to know more about deploying an SNS as part of an online or blended course, and many avenues for further investigation were

suggested.

Delimitations of the Study

This study was focused on gathering information regarding educators' use of social network websites and associated social media tools in formal educational contexts, and their impressions regarding the influences that these technologies may have on education in general. At the time this research project began (2008) these were relatively new technologies. Their use as educational tools was still in the experimental stage, there were no formally established and accepted standards or principles regarding this use, and the situation was the same concerning the design and conduct of research on this topic. The body of relevant literature was small, and much of the literature reviewed represented an early developmental stage i.e. informally published reports, small-scale research projects, conference presentations and proceedings, and expert opinion and editorial pieces. This study should therefore be considered initial exploratory research, intended to be a "broad-ranging, purposive, systematic, prearranged undertaking designed to maximize the discovery of generalizations leading to description and understanding of an area of social or psychological life" (Stebbins, 2001, p. 3).

The findings of this study were not representative of educational technology use in general, or educational contexts in general. They primarily represented the subjective viewpoints and impressions of participants self-selected due to their interest in, and experience with, the topic at hand. The generalizability of this study may be effected by the self-selected nature of the participants, all of whom were active in the online community, interested in the use of social network sites and Web 2.0 tools in general, and presumably well-disposed towards technology-enhanced teaching and learning.

In addition to potential sampling errors, non-sample related potentials for error existed. Example possibilities of these factors include the wording of survey questions (for example, the use of unclear or unfamiliar terminology, or the use of English as the sole survey presentation language), issues related to the online delivery of the survey (the usability of the survey software; the inability to prevent multiple responses by the same user), and the inability to determine the motives or purposes respondents had for completing the survey (some responses were clear attempts to "spam" the survey with promotions of products or services).The applicability of findings may therefore be limited to the development of a general qualitative view of themes related to the research topic and questions rather than the production of a set of exact quantitative measures.

CHAPTER 2. LITERATURE REVIEW

The use of social network sites (SNS) as components of education delivery represents nearly uncharted territory for researchers (boyd & Ellison, 2007). If teachers are to leverage learners' everyday experiences in Web 2.0-enabled contexts in order to increase student engagement in content area learning, researchers need to address the roles teachers and schools can play in modeling and facilitating learning through creative and participatory online practices (Greenhow et al., 2009). Online practices of this sort increasingly center on the use of social network sites and the social media tools associated with them, leading to the implication that social media technologies must have a place in the educational setting. There is a need for data generated by theoretically driven empirical research, information that can be used to answer questions concerning what is actually taking place when social software technologies meet education (Dutton, 2008; Selwyn & Grant, 2009).

This research project employed exploratory mixed-methods research methodology (Creswell & Plano-Clark, 2007; Stebbins, 2001) to investigate instructors' use of social network sites as tools for teaching and learning. Objectives included the provision of insight into a the paradigm shift occurring in the realm of digitally-mediated education delivery and the creation of a conceptual map modeling the use of social network software in support of constructivist learning approaches. The study was guided by the following research questions:

1. What are educators' perceptions regarding the general utility, benefits, and drawbacks of social network sites as educational tools?

2. What are the views of concerned experts and classroom teachers experienced with the

use of social network sites in their practice in regard to the potential of this technology to engender paradigmatic change in educational domains?

3. To what extent do these data enable the development of a model for the use of social network sites in teaching and learning?

The following review of literature provided background and context important to understanding the evolving technologies and techniques that constitute digitally-mediated education delivery and learning. This section includes a review of developments in the purposes and methods of online education delivery, definitions and descriptions pertinent to the Web 2.0 phenomenon and the rise of social media, and an overview of extant literature relevant to the deployment of social network sites in educational contexts and as learning tools.

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Digitally-Mediated Education

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Education Today: Crisis and Change

Educators around the world will work in a future framed by ubiquitous digital technology and featuring major changes in the socio-cultural environment. A trend of constantly increasing pressure to engage in life-long learning is well-established in the United States and other post-industrial nations, and increasingly visible in developing industrial societies. Fueled by the growing necessity for frequent occupational transitioning and re-training, this trend is driving a burgeoning growth in the number of students of non-traditional age and background (Merriam, Caffarella, & Baumgartner, 2007; United Nations Educational, Scientific & Cultural Organization [UNESCO], 2002). Non-traditional aged learners often strive to fit education and training time into schedules already filled with the complications of busy lives. These learners' demand for delivery

systems that can efficiently mesh learning time into their lives is a primary impetus for recent sweeping changes in the way education and training are delivered, with the resulting rise in implementation of networked interactive technologies reconfiguring popular conceptions of teaching, learning, and educational institutions (Bonk, 2009; Gunawardena & McIsaacs, 2004; Kim & Bonk, 2006; Merriam et al., 2007).

Change is also being driven by struggles to move traditional higher education beyond what Daniel (1997) referred to as a three-pronged crisis of access, cost, and flexibility. Even as greater numbers of older students are demanding access to the learning opportunities they need to keep pace with global-scale economic changes, population growth is outstripping capacity to provide young people with access to universities. With one half of the world's population under 20 years of age, developing countries in particular face a crisis of access that impedes efforts to meet the needs of large, young populations eager to gain the formal educational qualifications that are seen as a portal to the modern middle-class consumer lifestyle (Daniel, 1997; UNESCO, 2002). In the emerging economies, particularly in south-east and northern Asia, there is high demand for educational services but inadequate provision; in most developing countries, less than 5% of the population currently has access to higher education (Larsen & Vincent-Lancrin, 2002a, 2002b).

For example, in China, millions of high school students pass the university entrance exams, yet a majority of them cannot be accommodated in the existing Chinese university system. India's colleges and universities will have to accommodate 50 million students annually by 2050, while Cairo University enrolls over 250,000 students in facilities designed for 50,000 (Institute of International Education, 2002). Daniel (1997)

suggested that a new college campus (supporting about 8,000 students) would have to be built somewhere in the world every week just to maintain present participation rates. Without access to higher education, in a global labor market that demands increasingly complex literacy forms and basic skill sets, entire populations of young adults will be subjected to the effects of unemployment, socioeconomic disconnection, and instability. This would have dire implications for security and stability on a global scale, and is a scenario that must be avoided at all costs (Daniel, 1997).

The three ingredients of the crisis blend differently according to location. In industrialized countries in general, the structural problems of education in modern society make it difficult for conventional systems and institutions to both meet the challenge of extending life-long learning opportunities and deal with changing demands concerning mass education and the new skill sets required by a changing economy (UNESCO, 2002).

In the U.S., the crisis has a prominent economic aspect, with the cost of higher education rising precipitously. The National Center for Education Statistics reports that inflation-adjusted prices for undergraduate tuition, room, and board at public and private institutions increased by 30% and 23% respectively between 1997–98 and 2007–08 (USDE, 2009). In 2008–09, average 4-year postsecondary institution tuition and fees in constant 2009–10 dollars were $12,100 (public institutions: $6,400; private for-profit $15,300; private not-for-profit $24,900) (Aud et al., 2011). There is little hope for a state-sponsored solution to these rising costs; the functional bankruptcy of California and many other states is certainly well-publicized, and broader analysis reveals that America as a whole is effectively bankrupt (Bonner & Wiggin, 2003; Mauldin & Tepper, 2011).

Declining property values and reduced consumer spending associated with the

depression (Harding, 2011) that has followed the financial crisis of 2008 have cut into tax revenues important to schools in the K-12 system, and publicly-supported higher education institutions were already being described in 2004 as facing a budgetary crisis due to cuts in state funding initiated in response to economic slowdown (Hebel, 2010; Heller, 2006). Over the past several decades, state spending on higher education has been declining in terms of the proportion of state budgets spent on public colleges, and generally not keeping pace with enrollment growth and inflation. The global financial crisis only exacerbated the trend, and many fiscal analysts say state spending on higher education may never regain previous levels. In some states, entire institutions may be closed down (Hebel, 2010). The world's greatest system of public higher education is being dismantled as government money is withdrawn from the institutions that helped build the American middle class (Dillon, 2005; Giroux, 2007b).

At any rate, solutions are not likely to be found in the traditional U.S. higher education model because the world's strongest university system is "…peculiarly wedded to the technologies of real-time teaching and to the outmoded idea that quality in education is necessarily linked to exclusivity of access and extravagance of resource" (Daniel, 1997, p. 10). Traditional higher education has continued to be marketed as a lifestyle product for the children of a narrowing class of citizenry: parents who have from ten- to thirty-thousand dollars a year of discretionary income, and young people who can afford to extend the childhood period into their twenties before seriously engaging in making a living. The old model for higher education has been relatively slow to update in comparison to the pace of change that is ongoing in the broader social context. It is only recently that financial crisis and the mass unemployment and impoverishment of

members of the former American middle class have brought to the fore institutions that provide the type of accessibility and flexibility needed by mature adults attempting to reenter or maintain their place in the job market.

It is clear that the three-pronged crisis Daniel wrote about in 1997 has now combined with the ongoing advance of decentralized "flat Earth" (Friedman, 2005) business and industrial models to generate a rapidly growing need for deployment of alternative and non-traditional educational modalities (UNESCO, 2002). If they are to take part in the modern economy, people must be provided with ubiquitous equitable access to educational products of a quality similar to those formerly available only via attendance at brick and mortar institutions (Daniel, 2003). At this point, online delivery of digitally-mediated educational opportunities appears to be the only model with the potential to support such access (Bonk, 2009).

Distance Education

The term "distance education" connotes a media-enhanced learning process undertaken by physically separated students and instructors. According to a definition proposed by Clark and Verduin (1991) "distance education occurs when more than half of the formal instruction, or teaching, is done at a distance" (p. 13). Holmberg (1995) defined it as various forms and levels of study in which instructors and learners benefit from the planning, guidance, and teaching offered by a central organization despite not being present together on the same premises. "Distance learning is generally recognized as a structured learning experience that can be done away from an academic institution, at home or at a workplace" (Gunawardena & McIsaacs, 2004, p. 358). Keegan (1980) identified key elements that define distance education:

- quasi-permanent separation of teacher and learner throughout the length of the learning process,

- influence of an educational organization in the planning and preparation of learning materials and in the provision of student support services,

- use of media to link teacher and learner and carry the content of the course,

- provision of support for two-way exchange of communication, and

- quasi-permanent absence of the learning group throughout the length of the learning process.

These authors are in agreement regarding the presence of an educational organization or institution that provides structure and evaluative mechanisms in support of education delivered at a distance. It is this institutional presence that distinguishes formal distance education from (for example) students reading the opinions of distant experts from textbooks, or doing homework outside of school grounds and hours (Holmberg, 1995). Distance education is also referred to as distance learning, networked learning, distributed learning, and learning in connected space. In the United Kingdom, home of the first large-scale Open University (characterized by broad reach and accessibility, minimal formal educational requirements for admission, and open-entry/open-exit courses that begin and end when the student is ready), distance strategies are identified as flexible- or open-learning (Gunawardena & McIsaacs, 2004).

Distance education is not a new concept, and in fact may be nearly as old as the written word itself (Clark & Verduin, 1991). The modern version evolved from correspondence education paradigms, based on teaching via combinations of self-instructional texts and written communication, that date back at least to the 1830s (Clark

& Verduin, 1991; Holmberg, 1995). The first modern distance educator is generally

recognized to be Isaac Pitman, who began teaching shorthand by correspondence in Bath,

England, in 1840 (Clark & Verduin, 1991). Over the following years, the development of

distance education of various types and purposes continued in Europe and America.

University-level distance study began in America in 1874 at Illinois Wesleyan University,

and in England through the University of London in the 1880s. American elementary

schooling by correspondence began in 1906 with the Calvert School of Baltimore,

Maryland (Clark & Verduin, 1991).

Distance education remained a relatively minor facet of overall education delivery

until the 1970s, when public interest in distance education offerings rapidly increased and

distance education methods were integrated into the delivery of education in many

countries. By the 1980s, distance learning was included in many national systems as a

standard component of the provision of education, and it is now practiced in all parts of

the world to offer educational opportunities to those not able or unwilling to engage in

standard classroom-based learning (Clark & Verduin, 1991; Gunawardena & McIsaacs,

2004; Holmberg, 1995; Keegan, 1996). Although an increasing number of distance

learning programs are being developed for elementary and secondary students, the main

audience for distance courses is the adult and higher education market (Gunawardena &

McIsaacs, 2004; Palloff & Pratt, 2007).

From the beginning, distance education was marketed as a solution for adults who,

due to occupational, social, and/or family commitments, had limited time to pursue their

educational goals (Holmberg, 1995). Distance programs provided these individuals with

opportunities to expand their intellectual horizons and upgrade professional knowledge

and skills in study programs offering self-directed learning in formats that were largely free of time and location constraints (Holmberg, 1995). Demand for these programs has increased apace as the globalization of national economies has created a competitive atmosphere that has dramatic implications for adult learning (Gunawardena & McIsaacs, 2004; Merriam et al., 2007; UNESCO, 2002). The last decade has seen ever-increasing employment of distance education both nationally and internationally, and it is "currently the fastest growing form of domestic and international education" (Gunawardena & McIsaacs, 2004, p. 355).

In the U.S., approximately 56% (~2,320 institutions) of all U.S. 2- and 4-year Title IV degree-granting postsecondary institutions were offering distance learning opportunities by 2001. Among only public institutions, the number was far higher: approximately 90% of all public colleges offered at least some distance learning courses in 2001 (Waits & Lewis, 2003). The trend continued upward, and in 2006-2007, 66% of American 2- and 4-year Title IV institutions were offering online, face-to-face/online blended, or other distance education courses (Parsad & Lewis 2008). Universities and colleges are the primary forces in distance education at this point, and with online enrollments growing substantially faster than overall higher education enrollments (Allen & Seaman, 2007; Allen & Seaman, 2011), it appears that the majority of future distance education offerings and enrollments are likely to be represented by online higher education.

Internationally, distance learning is central to the education policy of many countries (UNESCO, 2002), and is a very important tool in meeting the needs of students who otherwise might have limited or no access to higher education. China became the

first country to provide a unified distance higher education program through the use of radio and television. The establishment of the Radio and TV University system in 1960 significantly contributed to broadening access and opportunities especially to higher education and to socioeconomic development more generally. In India, distance learning dates back to the 1960s. By the 1980s, there were 34 universities offering correspondence education through departments designed for that purpose. Indira Gandhi National Open University, based on the British model, now enrolls over 3.5 million students. South Africa leads in the provision of African distance education with its Technology Enhanced Learning Program, the Telematics for African Development Consortium, and projects such as the Shoma teacher development program which uses satellite TV and Internet technology to support in-service training for under-qualified teachers.

The Arab states are home to distance learning programs that have been launched in several countries, with headquarters of the Arab Open University project formally established in Kuwait. Demand for entry to higher education is so strong in this region that many foreign providers have been attracted to establish institutions in Bahrain, Dubai, and other urban centers. In Maylaysia, the difficulties associated with the economic downturn of the 1990's stimulated wider provision and public acceptance of distance delivery in higher education, and most Maylaysian institutions now offer distance learning programs. Thailand has a robust system of open and distance learning institutions that provide programs nationwide that utilize the country's comprehensive communications infrastructure to employ current Internet technologies in the delivery of multi-media supported instruction. These are just a few examples to demonstrate the evolution of distance learning well beyond its roots in early, print-based correspondence

models to a true worldwide movement powered by various technologies (Gunawardena & McIsaacs, 2004; UNESCO, 2002).

The Rise of Digitally-Mediated Learning Delivery

Distance education has always been defined by the freedom to access learning through time and space; that freedom is now further supported by technologies that provide teachers and learners with new delivery tools, instructional techniques, and learning activities (Anderson, 2008). The rapid spread of computer networks, particularly the Internet and the World Wide Web, has generated an interest in networked learning, sometimes referred to as learning in connected space or learning in the virtual classroom (Gunawardena & McIsaacs, 2004; Palloff & Pratt, 1999, 2003). Networked learning may involve major portions of discussion and assessment done in traditional classrooms, but include web-enhanced features such as online syllabi, readings and assignments. Or it may consist of web-based instruction in which the entire course is online. Other strategies are based on hybrid combinations of distance and traditional education (Gunawardena & McIsaacs, 2004; Palloff & Pratt, 1999, 2003). Networked learning enables the delivery of learning resources to remote geographic areas. In addition, given the presence of adequate technology infrastructure, it can be used in educating large populations of people (Gunawardena & McIsaacs, 2004).

Since the 1980s, the use of networked computer technology for the delivery of learning programs and courses has gone from being an obscure phenomenon to constituting mainstream practice. For many people, the term distance education now automatically conjures up images of cyberspace, computers, online learning, and the Internet (Palloff & Pratt, 1999, 2003). Indeed, "Computer-supported learning has been

the fastest growing component of distance education" (Gunawardena & McIsaacs, 2004, p. 369). Similar trends appear around the world, and most distance education in developed countries today takes the form of online learning (Gunawardena & McIsaacs, 2004). At the same time, advances in mobile technology are blurring the delineation between computers and a range of other devices (for example: mobile phones, music players, personal digital assistants, and digital tablets). Consumers and course designers alike are using a variety of tools to deliver and receive educational content and learning experiences. What was once termed e-learning, or computer-mediated learning, has become more commonly referred to as "digitally-mediated learning". This term refers to learning within a medium provided by digital technology of various types and configurations, with interaction among participants and between participants and learning materials carried out through the technology (Grudin, 2000).

Digitally-mediated education and training delivered over public and private networks will represent an important paradigm in the future of higher education (Kim & Bonk, 2006). In the U.S., online degree programs, uncommon just ten years ago, are now offered by nearly all higher education institutions. In a 2006 study of U.S. online education, researchers for the Sloan Consortium collected data from over 2,500 colleges and universities and found that almost two-thirds of the country's largest institutions had fully degree online programs (Allen & Seaman, 2007). In the 2011 version of the Sloan research project "Going the Distance: Online Education in the United States", 65% of the reporting institutions said that online learning was a critical part of their long-term strategy (Allen & Seaman, 2011).

Modern technology with its nearly unlimited potential for offering people of all

ages and economic levels increased access to learning opportunities is converging with changing demographics to reshape education and training (Gunawardena & McIsaacs, 2004; Merriam et al., 2007). The inherent accessibility and convenience of online delivery modes and proliferating digital avenues for the pursuit of professional development via occupational training as well as engagement with traditional academic content are positioning the online environment as a primary context for adult/post-secondary learning in general. The rapid growth in course and degree program offerings supported an accompanying increase in U.S. postsecondary distance/online education enrollment, which rose from 753,640 in 1994-95 to over 6.1 million, with 31% of higher education students taking at least one online course in during the fall 2010 term (Allen & Seaman, 2011).

For several years, online higher education course enrollment showed a compound annual growth rate of over 20% (Allen & Seaman, 2006). Although that rate of growth has slowed slightly, it still remains at 10% and far exceeds the less than 1% growth of the overall higher education student population (Allen & Seaman, 2011). Another aspect of this explosive growth is the rapid expansion of online education into the pre-college arena. An estimated 1,030,000 American K-12 students were enrolled in one or more online courses in 2007-2008, a 47% increase since 2005-2006, and 66% of school districts with students enrolled in online or blended courses were anticipating growth in online enrollments (Picciano & Seaman, 2008). By 2010, over 4 million K-12 students were participating in some kind of formal virtual learning program (Ambient Insight, 2011). The number of full-time virtual school children was at least 293,000, and there were an additional 217,000 students in cyber charter schools. Including home-schooled

children taking online classes, the online K-12 student population is growing by a five-year compound annual growth rate of 30.7% (Ambient Insight, 2011). According to market projections by Ambient Insight (2011), over 29% of all US school children will be participating in some kind of online instruction by 2015.

Blended Learning

Online network technologies are now firmly established as the delivery systems of choice for pure distance education offerings (Allen & Seaman, 2006). In addition, as part of efforts to enrich students' learning experience, maximize efficiencies in time and facilities use, and enhance program marketability, many institutions are leveraging the Internet to increase their offerings of blended courses that employ various combinations of onsite and online formats (Mossavar-Rahmani & Larson-Daugherty, 2007). Blended learning is a term that has entered widespread use in training and education settings as a description of particular forms of teaching with technology. Although there is some ambiguity as to the exact meaning of the term, a practical definition that has gained some currency proposes blended learning to be education delivery that takes place in environments where F2F instruction is combined with digitally-mediated instruction (Graham, 2006; Graham, Allen, & Ure, 2005; Oliver & Trigwell, 2005). In this model, blending occurs as part of the instructional design at the course level, as opposed to the institutional level as in the case of dual-mode universities that feature on-campus and distributed education branches (Graham et al., 2005).

There has been a dramatic rise in the use of blended learning approaches in recent years, and they are becoming the delivery method of choice in higher education, corporate America, and governmental training settings (Bonk et al., 2005). In a 2003

survey of over 500 instructors, technology specialists, instructional designers, and program administrators, 70% of respondents from higher education settings, and 60% of those from the corporate training sector anticipated that 40% or more of course offerings would implement blended formats by 2013 (Bonk et al., 2005). In higher education, blended learning is expected to receive more emphasis than fully online courses, and it is possible that a majority of courses will have some Web component by the end of the decade (Kim & Bonk, 2006). "Individualized instruction delivered in multimedia settings has begun to blur the distinction between distance education and traditional education" (Gunawardena & McIsaac, 2004, p. 376). A future is visible in which schooling is dominated by blended delivery models that fluidly combine traditional and distance instructional modes within the affordances of technology-enhanced delivery and interaction (Kim & Bonk, 2006). Experience with the UK's Open University, the Shanghai TVU, and others among the mega-universities (Daniel, 2003) demonstrates that these models combine human, technological, and organizational aspects in a powerful way to revolutionize education by offering greatly expanded access to quality resources delivered at a much lower per-student cost (Daniel, 2003; Jung, 2005).

Technological and social change drive transformation in the way people live and work, and the contemporary "information age" is characterized by the diffusion of information and communications technologies, and an increasing demand for new educational approaches and pedagogies that foster lifelong learning (Fischer & Konomi, 2005; McLoughlin & Lee, 2007). Social trends such as the diversification of life trajectories, the need for multiple career paths and ongoing re-skilling, and the necessity of flexible working hours are drivers of learning on demand (Punie & Cabrera, 2006),

and digital modalities have risen to primacy in the effort to efficiently deliver demand-driven learning (McLoughlin & Lee, 2007). Digitally-mediated learning has already dominated the distance learning field, and its rapid deployment will likely continue across all areas of the broad education/training spectrum as the impetus of technological development pushes the boundaries of what was initially simply a correspondence course paradigm wrapped in electronic packaging (Bonk, 2009; Kim & Bonk, 2006; Singh, 2003).

Social Software and Education

e-Learning 2.0.

Increasingly refined approaches to teaching and learning in the online context are developing as education delivery moves toward further reliance on digital tools and mediums. Early experiences with various models of what is now referred to as first wave e-learning were instructive in highlighting both the advantages and disadvantages of the use of digital technology in education and training (Singh, 2003). Poorly designed software, difficult and unreliable hardware, and instructional designs that were repetitive, predictable, and lacking in constructive learning opportunities were some of the initial stumbling blocks encountered by instructors and students alike (Taylor, 2002).

While improvements in these areas have progressed apace with the arrival of what is often called second wave e-learning (Taylor, 2002), it is only recently that one of the primary downsides of both on- and off-line digitally mediated learning is beginning to be addressed. This is the increased student isolation, decreased interpersonal interaction, and loss of social connectivity that are traditional disadvantages of distance education, and are now often associated with learning delivered via computer (Anderson, 2005a;

Simpson, 2003; Singh, 2003). Computer mediated learning is often a lonely experience, particularly in formats that feature continuous enrollment and individual pacing in an effort to maximize freedom and flexibility for participants (Anderson, 2005a). As part of the effort to counter this effect, current guiding principles and practices for developing quality online education offerings suggest that an effective learning environment will provide a network of meaningful interactions among learners, materials, and the instructor (Haythornthwaite, Kazmer, Robins, & Shoemaker, 2004; Ragan, 1999). As a foundation for such interaction, learners must be enabled in the establishment of a social presence in the virtual environment and empowered to express themselves in multiple modalities (Garrison & Anderson, 2003; Gunawardena & McIsaacs, 2004; Haythornthwaite & Bregman, 2004; Haythornthwaite et al., 2004; Palloff & Pratt, 2003, 2007; Ragan, 1999).

To this end, the expansion of broadband Internet service and the proliferation of Web 2.0 social media tools now offer many capabilities for communicating and connecting that were not available to practitioners of first wave e-learning (Singh, 2003; Taylor, 2002). These new interactive software tools are variously identified as the Read-Write Web, Web 2.0, Semantic Web, Internet.Next, or Social Media. DiNucci (1999), writing in "Print" magazine, is credited with the initial use of the term Web 2.0 in reference to the first generation of software applications capable of transforming the Internet from a collection of text and graphics into a medium for interactivity. Tim O'Reilly and Dale Dougherty, of O'Reilly Media, further developed the idea with the first O'Reilly Web 2.0 conference in 2004, and the concept soon entered the popular culture.

Applications are small software tools that can deliver active and interactive content to a browser window, support interaction between mobile devices and the Internet, and allow interactivity between the user, the web, and the tool itself (O'Reilly, 2005). In general, Web 2.0 technology consists of Internet applications created using sophisticated programming technologies such as Macromedia Flash, Flex, and AJAX (Asynchronous JavaScript and XML) that allow rich, dynamic content to be delivered to the users of a website (Akamai Technologies, 2006). The Web 2.0 label is derided in some circles as a faddish media buzzword (boyd, 2007), with the argument being that the Internet has always comprised a network of individuals connected through social technologies like e-mail, chat rooms and discussion boards. However, the term serves a useful purpose in referring to a technology that has evolved beyond its origins in the provision of largely text-based, viewable/downloadable content to now enable members of the general public to participate, communicate, and collaborate in actively shaping online content (Alexander, 2006; McLoughlin & Lee, 2007).

Social media and learning.

The terms social media and social software are used interchangeably in the literature, with the former coming to the forefront in recent years. Although it is a concept resistant to clear definition (Anderson, 2005a; boyd, 2007), social media can be generally understood as an umbrella term referring to the set of tools, services, and applications that allow people to interact with others using network technologies (boyd, 2008). Writers on the subject often cite Shirky's (2003) definition of social media use as online activities centering on contacts between people who then build shared meanings via social software tools that support group interaction and communication with network

technology as a platform and conduit. Social media is software that lets people interact with other people and data in fluid ways that may also lead to the creation of user-generated online content (boyd, 2007).

Social media takes many forms, and encompasses but is not limited to (a) groupware, (b) Internet forums, (c) online communities, (d) RSS feeds, (e) wikis, (f) tag-based folksonomies, (g) podcasts, (h) e-mail, (i) weblogs, (j) virtual worlds, (k) social network sites, (l) instant messaging, texting, and microblogging; (m) peer-to-peer media-sharing technologies, and (n) networked gaming (boyd, 2008; Dron, 2006; Greenhow et al., 2009; McLoughlin & Lee, 2007; Shirky, 2003). Well-known examples of social media applications include Google Groups, Wikipedia, MySpace, Facebook, YouTube, Second Life, Flickr, and Twitter. Social media has come into use by hundreds of millions of people world-wide in the span of a few short years, allowing people to connect online and form relationships for personal, political, and business use. Social media promotes new patterns of social interconnection (boyd, 2007, 2008; Levin, 2004), and its power is concisely reflected in boyd's comment that social media "Has affected how people interact with one another and, thus, it has the potential to alter how society is organized" (2008, p. 93).

Social media applications encourage and support interaction and personal expression by providing Internet users with the capability to easily create, contribute, communicate, and collaborate in the online environment without employing specialized programming knowledge. Social media use is people-driven from the bottom up. It empowers individuals to express their own biases and connections an then reflect them in social relationships and interactions that spread inductively, passing first from the

individual to a group, then on to other people and other groups. This approach appears

disorganized, but is often an effective method for the formation of strongly motivated

groups and working teams (Marenzi et al., 2008). Although social media technology is

still very new, it seems as if it will change the way learning systems, groupware, and

other project-oriented digital collaboration tools work (Marenzi et al., 2008). The

development of these tools has initiated a paradigm shift in digitally-mediated teaching

and learning as instructors working in online or blended learning contexts experiment

with one or several of Web 2.0 applications, and apply the affordances of this software to

the delivery of digitally-mediated learning (Alexander, 2006; McLoughlin & Lee, 2007).

According to Anderson (2004), an affordance is an action that a particular tool

enables an individual to perform. When used in educational contexts, the most important

affordance of social media is a profound and multifaceted increase in communication and

interaction capabilities. McLoughlin & Lee (2007) list the following examples of the

affordances of social software tools:

- connectivity and social rapport,

- collaborative information discovery and sharing,

- content creation, and

- knowledge and information aggregation and content modification. (p. 667)

Social media tools drive new patterns of social interconnection in multiscale spaces that

support pervasive and multiple formats of communication ranging from synchronous to

asynchronous, one-to-one to many-to-many, and text to full multimedia (Levin, 2004).

The many affordances of social software and the always connected nature of today's

learners presents educators with the prospect of being able to employ technology tools

that offer students and teachers flexible connectivity, encourage engagement with peers, and support the traditional core academic practices of reflection, discussion, analysis and research (Fitzgerald et al., 2009). Social media has features that encourage interconnections among learners and allow them to develop networks of people to consult for feedback or support. Other features empower learners to create, consume, and share independently produced information, media, and applications (Greenhow et al., 2009).

Web 2.0 technologies enable hybrid learning spaces that travel across physical and cyber spaces according to principles of collaboration and participation. Today, learners have more choices about how and where to spend their learning time (e.g., in online settings or in private, public, or home school options) than they did 10 years ago. Today's youth are frequently creative, interactive, and media oriented; use Web 2.0 technologies in their everyday lives; and believe that more use of such technologies in school would lead to increased preparation and engagement. (Greenhow et al., 2009, p. 247)

The nature of today's world, with its high digital connectivity and need for ubiquitous demand-driven learning, presses for the development of pedagogies and andragogies that include learners as active participants or co-producers rather than passive consumers of content, and frame learning as a participatory, social process intended to support personal life goals and needs (McLoughlin & Lee, 2007). As online learning delivery has developed, the emphasis has been on constructivist pedagogies that focus on knowledge construction, problem-solving, collaborative learning, critical thinking, and autonomous learning - all skills considered to be essential in a knowledge-based economy (Bates, 2008; Dalsgaard, 2006). Particularly in programs that feature

open-enrollment, and self-paced learning, there is a need for delivery systems that can maximize learner independence and freedom while providing the capabilities for communication and collaboration demanded by constructivist pedagogies (Anderson, 2005a). The use of social software applications in online education delivery encourages collaboration, while supporting self-direction and individuation (Dalsgaard, 2006; Anderson, 2005a).

Learning management systems or, more accurately, Content Management Systems (CMS) that integrate geographically dispersed learners in asynchronous educational interactions have been widely available for several years, but they tend to lack support for the establishment of flattened communication networks and collaborative information flows (Dalsgaard, 2006; Siemens, 2004a). As currently configured, content management systems allow each student to have a personal view of the course(s) they are enrolled in. However, they conform to a classroom metaphor, and do not accommodate the social connectivity tools and personal profile spaces that students might choose based on their out-of-class SNS use (McLoughlin & Lee, 2007). The CMS tends to simply replicate traditional models of teaching and learning in the online environment. Even though some systems now incorporate Web 2.0-type tools and features, these are typically situated in a walled garden environment within the confines of the host institution's systems and networks. The overall effect is to create online learning environments set in frameworks constructed by teachers and administrators, who fully control the availability and uses of the tools associated with the CMS (McLoughlin & Lee, 2007).

Content management systems are well suited for handling student enrolment,

exams, assignments, course descriptions, lesson plans, messages, syllabi, and basic course materials. However, these systems were developed for the management and delivery of content and the online accomplishment of general course administration work rather than for supporting the self-governed and problem-based activities of students. Therefore, a CMS does not easily support a social constructivist approach to digitally-mediated learning (Dalsgaard, 2006; Siemens, 2004a).

In contrast to standard content management systems, which are teacher/institution centric and emphasize content handling and two-way communication (Siemens, 2004a), social software offers far more interactivity and a distributed web of communication paths. In this way, social software fosters interaction, community feeling, and group motivation (Dalsgaard, 2006; Dalsgaard & Paulsen, 2009). Connection and dialogue are supported, offering the potential for transformation and enabling the possibility of lifelong competence development (Marenzi et al., 2008). Social software enables the movement beyond learning management systems and the engagement of students in active use of the web itself as a resource in self-governed, problem-based and collaborative activities (Dalsgaard, 2006).

Educators are beginning to acknowledge the potential of social media. Classroom teachers are very interested in social software tools, and they are experimenting with them in classrooms as quickly as they are developed. However, the research base is in an early stage of development and the most effective means of application as well as the ability of these technologies to influence learning outcomes have not been extensively investigated (Alexander, 2006; Anderson, 2008; Dalsgaard, 2006; Johnson et al., 2009). There is no question that these tools have many features that would enable them to be

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effective in technology-enhanced educational contexts. For one thing, social media is popular with young people. Both quantitative and anecdotal data reveal widespread use of social media among youths of student age in societies where Internet access is a common feature (CCCSE, 2009; boyd, 2008; Greenhow et al., 2009; Lenhart, Madden, Smith, & Macgill, 2007).

At the same time, many higher education institutions are discovering that a new generation of learners is looking for new models of teaching and learning (McLoughlin & Lee, 2007). These models must include learners as active participants or co-producers rather than passive consumers of content, and frame learning as a participatory, social process intended to support personal life goals and needs (McLoughlin & Lee, 2007). Students today want to participate in the learning process; they look for greater autonomy, want more socio-experiential learning, have a need to control their environments, and are used to instant connectivity and easy access to the staggering amount of content and knowledge available at their fingertips (Johnson et al., 2009; McLoughlin & Lee, 2007; Oblinger, 2008).

For these students (and their instructors), social media represents a growing set of free and simple tools and applications that confer the ability to configure, create, reorganize, and manage online content rather than just viewing it (Oblinger, 2008; Oblinger & Oblinger, 2005) . This ability allows users to create customized personal web-based environments that explicitly support social, professional, educational, and other activities via personalized windows to the networked world (Johnson et al., 2009). Personalization is at the heart of the Read-Write Web that the Internet has become. The network is now personal, interactive, and unquestionably a communicative experience.

While faculty may still tend to think of the Web as a source of information, today's college students recognize it mainly as a social communications medium (Pence, 2006).

Younger students in particular may see Web 1.0 communication tools such as e-mail or discussion boards as being clunky, one-dimensional, and outdated (Robbins, 2008). Web 2.0 communities center on the affordances of social media: social networking sites, blogs (often associated with an SNS), text-messaging, and new generation micro-blogging "update" services like Twitter that allow users to use a mobile phone or a computer to send short updates about their daily lives and activities to a website and to other users' phones or computers. Most young students today are likely to be familiar with these communication tools, and many are satisfied with and good at carrying on interpersonal relationships and interactions via technological mediums of this sort (boyd, 2008; Greenhow & Robelia, 2009; Lenhart, et al., 2007). When tools such as these are accessible, students do not feel that technology isolates or disempowers them. In fact they seem to rely on technology tools to manage their lives and their time (boyd, 2008; Greenhow & Robelia, 2009; Oblinger & Oblinger, 2005).

Anderson (2008) referred to social software technology as a new genre of distance education software emerging from the intersection between earlier technologies that generally support delivery and engagement with content, and new interactive technologies that support multimodal digitally-mediated human communication. This "educational social software" (Anderson, 2008) is comprised of "networked tools that support and encourage learning through face-to-face and online interactions while retaining individual control over the learners' time, space, presence, activity and identity" (Anderson, 2008, p. 174). In discussing educational social software (ESS), Anderson

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(2005a) noted that:

> The problems that social software addresses (meeting, building community,
> providing mentoring and personal learning assistance, working collaboratively on
> projects or problems, reducing communication errors and supporting complex
> group functions) have application to education use, and especially to those models
> that maximize individual freedom by allowing self pacing and continuous
> enrolment. (p. 4)

According to Dalsgaard (2006), learning cannot be managed. It can, however, be
facilitated. The educational potential of social software lies in empowering self-governed,
problem-based and collaborative activities by supplying students with loosely joined
personal tools for independent construction, and by engaging them in social networks.
This approach to e-learning gives students the ability to navigate and participate on the
web, and use it actively to solve problems (Dalsgaard, 2006).

Social software can "create opportunities for radically new conceptions of
independence and collaboration in distance education" (Anderson, 2008, p. 169).
Comprised of a suite of tools that can support learner choice and self-direction
(McLoughlin & Lee, 2007), social software can be used to create an open-ended learning
environment that provides multiple possibilities for carrying out activities in a learning
process that develops as part of self-governed problem-solving in response to a particular
pedagogy (Jonassen, 1999; Land & Hannafin, 1996). The goal of the instructor is to
promote the development of constructivist learning environments (Jonassen, 1999) in
which students are directed at solving a problem, and surrounded with tools that can be
used to find solutions independently and in collaboration with other students (Dalsgaard,

2006).

In this model, there is a requirement for tools that can support construction, presentation, reflection, collaboration, and the search for relevant resources (Dalsgaard, 2006). Currently available social software meets this requirement by enabling users with various private and public communication channels, providing spaces for the presentation and discussion of ideas in text, offering convenient multimedia support capabilities, and supporting both synchronous and asynchronous learning interactions.

Social software tools can potentially enable and strengthen relations between students within the same course by making their work visible to each other and allowing for reciprocal access to networks of people, references, and other information useful to the learning process (Dalsgaard, 2006). Social software can also be used to create overlay networks that enhance formal institutional networks that deliver institutionalized services such as student support, library resources, tuition billing and payments, registration and records, and so on (Anderson, 2005b). Anderson surmises that these educational overlay networks would serve to support social interaction and collaboration among students enrolled in formal education programs.

Engaging students in social networks and providing them with personal tools that support independent construction as part of self-governed, problem-based, and collaborative activities will facilitate a social constructivist approach to learning (Dalsgaard, 2006). In one investigation of the potential of social software to support peer engagement and group learning in higher education, the Digital Learning Communities (DLC) Project established a series of pilots that examined ways in which social software could provide students with opportunities to engage with their peers to supplement the

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more formal aspects of their education. The project found that there are indeed

opportunities for social software to be used to promote learning among students

(Fitzgerald et al., 2009). Other findings from the project also support the use of social

media technologies in education:

- University students need to learn new network and software literacies to become
  digital citizens, and learn how to better collaborate with each other and the wider
  community.

- University Information and Communication Technology (ICT) professionals need
  to examine ways to support, not hinder, lecturers' experimentation, development
  and wider introduction of new software and network services to support student
  learning.

- University administrators, ICT professionals and lecturers need to understand that
  while at the present time most students browse the Internet rather than actively
  contribute through producing and sharing content, there are strong indications that
  this is changing particularly with respect to social networking applications.
  (Fitzgerald et al., p. 1)

Social media can be used to drive what McLoughlin and Lee (2007) refer to as

Pedagogy 2.0, which makes use of the affordances of social software tools to enable

connectivity, communication, participation and the development of dynamic communities

of learning. In attempting to define Pedagogy 2.0, McLoughlin and Lee (2007) identify a

number of dimensions:

- Content: Micro units of content that augment thinking and cognition; learner-
  generated content that accrues from students creating, sharing and revising ideas.

- Curriculum: Not fixed but dynamic, open to negotiation and learner input, consisting of "bite-sized" modules, inter-disciplinary in focus and blending formal and informal learning.

- Communication: Open, peer-to-peer and multi-faceted, using multiple media types to achieve relevance and clarity.

- Process: Situated, reflective, integrated thinking processes; iterative, dynamic and inquiry-based.

- Resources: Multiple informal and formal sources that are media rich and global in reach.

- Scaffolds: Support for students comes from a network of peers, teachers, experts and communities.

- Learning tasks: Authentic, personalised, learner-driven and designed, experiential and enabling multiple perspectives. (p. 207)

Pedagogy 2.0 embodies the constructivist educational paradigm. It empowers learners to move well beyond traditional teacher-centered learning and toward the possibility of heutagogy, "a new set of principles and practices that may have application across the whole spectrum of the education and learning lifespan" (Hase & Kenyon, 2000, p. 2).

Heutagogy is a principle of teaching based on truly self-determined learning that has arisen in the twenty-first century learning environment of digitally-mediated learning (Hase & Kenyon, 2000). Heutagogy is not a new concept, but it has been revitalized and recognized as less of a linear approach to learning than andragogy (Eberle & Childress, 2005). Heutagogy takes into account the capabilities and motivation of the learner, and recognizes the need for flexibility and student-centeredness in the design and negotiation

of the learning process (Hase & Kenyon, 2000). It also takes into consideration the fact that much learning occurs independently and/or informally. Heutagogy "may be viewed as a natural progression from earlier educational methodologies - in particular from capability development - and may well provide the optimal approach to learning in the twenty-first century" (Hase & Kenyon, 2000, para. 1).

Heutagogy appears to be an appropriate methodology for application in combination with the Personal Learning Environment (PLE) concept. These are digitally-mediated front-ends, or what may be thought of as dash-boards or homepages, that serve as organizers, tools sets, and access points that empower students to interact with an information cloud that offers nearly infinite resources for knowledge-building and training of all sorts (Downes, 2005a). A PLE facilitates individual access, aggregation, configuration, and manipulation of the digital artifacts of the ongoing learning experience (Lubensky, 2006). The term PLE does not necessarily refer to a specific application or service, but instead is a conceptualization of the ways individuals approach the task of learning (EDUCAUSE, 2009). In digitally-mediated learning contexts, social software appears to be an ideal platform for the construction of engaging, user-friendly online personal learning environments, and the support of heutagogical instructional approaches that place the student at the center of a self-designed learning process (LeNoue & Stammen, 2011).

Social Network Websites

Social network sites (SNS) are web-based services that allow individuals to (a) construct a public or semi-public profile within a bounded system, (b) articulate a list

(network) of other users with whom they share a connection, and (c) view and traverse

their list of connections and those made by others within the system (boyd & Ellison,

2007). There are currently hundreds of social network sites in active operation worldwide.

The most well-known in the United States include Facebook, MySpace, LinkedIn, and

Bebo. These websites support virtual communities comprised of users who explicate their

social connections via the affordances of the software associated with the site (boyd &

Ellison, 2007).

The term "social networking sites" is often used interchangeably with the above

terminology, but boyd and Ellison (2007) choose not to employ it, stating that

"networking" emphasizes relationship initiation, and that this is not the primary practice

on many of these sites. While SNS users may be able to meet strangers online and make

connections that would not have been made otherwise, the unique aspect of an SNS is

that it allows users to make visible their social networks, while the capability to make

new acquaintances online can be associated with wide range of social media tools (boyd

& Ellision, 2007). Greenhow & Robelia (2009) describe the effect of social network site

use as "similar to allowing others to view your Rolodex and interact with it online",

making one's connections available to others as potential connections (p. 1132). In this

way, user's connections, usually referred to as friends, potentially become the

connections of other people, resulting in the creation of more numerous and varied

connections than would otherwise have been made (boyd & Ellison, 2007; Greenhow &

Robelia, 2009).

These sites often serve as platforms for sets of interactive media tools that can be

used to customize personal homepages and profiles, send and receive text-based

messages, run web logs (blogs) and discussion forums, post audio-visual media, and perform other functions. Hargadon (2009) describes social network sites as aggregations of Web 2.0 building blocks such as forums, directories, friending, chat, instant messaging, and so on, while boyd (2008) notes that the sites incorporate features from, and are an amalgamation of, many prior social media genres.

Social network sites have become very popular in recent years, and have attracted millions of users since their introduction in the late 1990's. The sites are a huge worldwide phenomenon, with growth accelerated by the presentation of such popular sites as Facebook in regionally-appropriate languages. According to the Nielsen Company (2010), social network sites and blogs were the most popular online category when ranked by the average time spent by site visitors in December 2009. Users spent over five and half hours on social network sites like Facebook and Twitter, an 82% increase from December 2008, when users spent just over three hours on this type of site. Facebook is the number one global social networking destination: with over 700 million users, is the most heavily-used SNS in 119 out of 134 countries (Wauters, 2011).

Building on extensive earlier research into computer-mediated communication (CMC), a body of scholarship focused on the SNS phenomenon in general is now developing. The work is both conceptual and empirical in nature, and arises from a variety of disciplinary and methodological bases including communications, information science, sociology, cultural studies, and computer science (boyd & Ellison, 2007; Greenhow & Robelia, 2009). It addresses a range of topics including identity construction and expression, impression management and friendship performance, the building and maintenance of social capital, networks and network structure, online/offline connections,

privacy issues, and differences between users and non-users (boyd, 2004; boyd & Ellison, 2007; DeAndrea, Ellison, LaRose, Steinfield, & Fiore, 2012; Greenhow & Robelia, 2009; Hargittai, 2007, 2008; Walther, Van Der Heide, Kim, Westerman, & Tong, 2008).

Social network sites attract and support networks of people and facilitate connections between them (McLoughlin & Lee, 2007). They are affinity spaces, as per Gee (2004), where people acquire both social and communicative skills while engaging in the participatory culture of Web 2.0 (McLoughlin & Lee, 2007). As such, they serve an important role in the lives and socialization of networked youth, supporting formal and informal learning, identity seeking and representation, creative and expressive forms of behavior, relational maintenance, and acquisition of new literacy practices (boyd, 2008; Greenhow & Robelia, 2009; Greenhow et al., 2009; Kress, 2003). Thus, in societies where digital networks are accessible, social network sites have become a nearly indispensable part of youth culture (Greenhow & Robelia, 2009; Smith & Caruso, 2010).

A British research report (Office of Communications, 2008) that drew on numerous qualitative and quantitative research studies included the finding that some teenagers and adults in their early twenties felt addicted to social network sites and were aware that their SNS use was squeezing their study time. This aspect of intensity and frequency in the use of SNS is common among young people. In a qualitative study of use of the Myspace social network site by low-income urban teens (17-19 yrs) Greenhow and Robelia (2009) found that students felt that their social network sites were essential to their lives. These teens logged into MySpace daily or several times per week, and engaged in four main activities: updating their online profile, monitoring updates to their friends pages, interacting with changes in the system, and initiating contact with others.

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The SNS functioned as a virtual phone, photo album, MP3 player, diary, notebook, storage space, and as a place to seek emotional support (Greenhow & Robelia, 2009).

boyd (2008) also presented evidence of the important roles that these online spaces play in the sociocultural development of teens. Social network sites provide young people with networked publics where adult power is not in play, and in which the space and the audience support youth's efforts at learning identity-construction and self-representation. These spaces assume critical roles in the lives of modern teens, as young people are increasingly constrained in their movements and denied access to traditional publics where they formerly made contact and socialized with peers, and established a place for themselves in the broader social world beyond home and school.

> Teens primarily use social network sites in ways that reinforce and replicate unmediated social dynamics. Teens are not engaging with social network sites as a separate or distinct world but as an extension of everyday life. Not only do social media extend the individual (as per Marshall McLuhan [1964]), but social network sites also appear to extend the social context and peer culture. (boyd, 2008, p. 107)

Social network sites are the new social spaces where young people are free to play out a portion of their natural tendency to invest in identity development and performance. Several scholars have described the effects of the online environment on self-presentation and noted the particular ways in which identity is negotiated as a co-construction of authors and audiences during interaction in the online social spaces (boyd, 2006; Kelley, 2010b; Mallan & Giardina, 2009; Pearson, 2009; Sanderson, 2008). Young people are adept at and comfortable with presenting themselves in these spaces (Oblinger &

Oblinger, 2005). In contrast to the general impression held by many parents and school officials, the use of an SNS is not a negative experience for the majority of young users. Ellison, Steinfield, and Lampe (2007, 2011) found that Facebook use, and the information-seeking behaviors associated with that use, correlated positively with the formation and maintenance of social capital. Young people find outlets for creative and expressive energies on the Internet due to their use of SNS (Tufecki, 2008). In fact, some research indicates that degrees of life satisfaction, social trust, and civic participation are related to the intensity of Facebook use (Valenzuela, Park, & Kee, 2009).

Social Network Sites in Education

Anderson (2005a), writing about designs for educational social software, delineated a list of the functions and features of social software that could be of potential use in online education delivery:

- presence tools that allow learners to make their presence known synchronously and asynchronously,
- notification tools that provide learners with notification when new content or communication is entered into a learning space,
- filtering tools that remove illegitimate information while bringing legitimate and potentially useful information to the attention of users,
- support for cooperative and collaborative learning,
- referral systems that track student activities and record outcomes, and
- profiling systems that record and present information about students. (p. 5)

The items in this list correspond almost exactly with the primary features common to social network websites, yet these websites were initially ignored within academia for

two reasons: all of the sites were hosted by proprietary interests, and the well-known sites were not known as loci for academic discussion (Bryant, 2006). However, social networking sites do appear to have a place in education (Bedard, 2009), and the pace at which the sites have been adopted by users of college age (Jones & Fox, 2009; Smith & Caruso, 2010) has attracted popular and academic interest in the impact these technologies may have on student academic outcomes (Abramson, 2011; Bryant, 2006; Kamenetz, 2011; Simonson, 2008).

Though they are often viewed as a negative influence on students, social networking sites are interactive spaces that make it possible for learners to explore facets of their own identity, engage in personal self-expression, and share dialogue and knowledge with others (McLoughlin & Lee, 2007). Engagement in these forms of conversation and interaction helps learners explore and develop facets of their own identities and personal learning styles (Greenhow & Robelia, 2009; McLoughlin & Lee, 2007). Students are afforded the ability to shape their own informal learning trajectories as well as becoming actively involved in the learning of others. They can gain insight into each other's experiences and actions, engage in collaborative learning, acquire the skills needed for the 21st century workplace, and master new, digitally-mediated literacies (Dalsgaard & Paulsen, 2009; Deubel, 2009; Greenhow & Robelia, 2009; McLoughlin & Lee, 2007; Ozkan & McKenzie, 2008; Saunders, 2008).

An SNS can offer course participants multi-modal and multi-media communication and content delivery capabilities that facilitate and stimulate broad and dense interaction patterns, collaborative information discovery and processing, and multiple-style learning opportunities (LeNoue & Stammen, 2009; McLoughlin & Lee,

2007). A dedicated educational social network website also provides a virtual space where course participants can meet and take part in various formal and informal interactions centered on shared learning objectives. This social space can be a positive component of an online course (Palloff & Pratt, 2003), and can encourage the development of the object-centered social structures (Engstrom, 2005) that arise naturally around the content, activities, and learning objectives that constitute the commonalities shared by course participants. These social structures are driven by interactions arising out of co-participation in the act of learning, and are associated with the building of a learning community (Rheingold, 1993). Such community-building has the potential to enhance learning outcomes (Haythornthwaite et al., 2004; Palloff & Pratt, 1999, 2005, 2007).

Social network sites are being adopted by higher education institutions for use in recruiting and communication, and in attempts to boost student engagement, ease the transition to college, and improve satisfaction and retention rates (Amador, 2011; Butcher, 2010; DeAndrea et al., 2012; Ferguson, 2010; Forkosh-Baruch, & Hershkovitz, 2012; Mix, 2010; Ward, 2010). It is common to see popular social networking tools linked to college websites, where they supplement traditional communication channels and provide prospective students a channel for interaction with current students, campus faculty and staff, and alumni before and during the application process (Mix, 2010). Enrolled students use SNS to interact with other students and institutional personnel, gain peer support, and access collaborative workspace (Mix, 2010, Selwyn, 2006, 2007).

Regarding student SNS use and education, there has been research concerned with student access to social network sites in school and public libraries (Charnigo & Barnett-

Ellis, 2007), and examination of the development of new forms of literacy among young users of social network sites (Dowdall, 2009; Greenhow & Robelia, 2009; Vie, 2008). Greenhow and Robelia (2009) found that MySpace use among low-income high school students both enabled the practice of new forms of literacy and supported social learning by providing (a) validation and appreciation of creative work, (b) peer alumni support, and (c) school task related support. Students reported using their social network site for getting advice on schoolwork and careers. It appeared that more intensive use of their SNS led to a higher likelihood that young people would view it as space for learning (Greenhow & Robelia, 2009).

Informal learning and activity associated with the completion of school assignments do take place on social network sites (Greenhow & Robelia, 2009; Greenhow et al., 2008; Madge, Meek, Wellens, & Hooley, 2009; Selwyn, 2007). Furthermore, majorities of student users of all ages report that education, and schoolwork specifically, are two of the most common topics of conversation on the social networking scene (Greenhow & Robelia, 2009; Greenhow et al., 2008; NSBA, 2007; Smith & Caruso, 2010). However, other studies have revealed that, while students do use SNS to communicate about schoolwork and do view the sites as making a positive contribution to academic life, the value of the sites is perceived to be primarily social rather than academic (Friday, 2010; Hewitt & Forte, 2006; Madge et al., 2009; Selwyn, 2007; Wodzicki, Schwämmlein, & Moskaliuk, 2012).

Despite the positive indications offered by early research efforts, the potential for using social network sites to enhance formal learning experiences is only now beginning to be explored (boyd & Ellison, 2007). In addition, the emerging body of research

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linking social network site use to school and education is primarily focused on students in higher education contexts. Despite the user demographics associated with social network site use, SNS use by younger (K-12) students is often viewed negatively by educators and parents alike (boyd, 2008) and the few K-12 teachers who are beginning to use social networking to move learning beyond the walls of the classroom face numerous obstacles. Many schools still block access to social network sites, and school officials are confronted by uncertainties and questions surrounding privacy issues, proper management, and cyber security when considering the use of social-networking sites at school (Davis, 2010).

Students in the U.S. and U.K. alike face barriers and restrictions to Internet access in general that affect teachers' choices regarding the use of online resources for coursework (boyd & Ellison, 2007; Jenkins, 2006; Levin & Arafeh, 2002; Selwyn, 2006). Thus, it is no surprise that there are few studies focused on the use of social network sites in K-12 settings. In one example, Whipple (2009) found that high school students enjoyed using a Ning SNS to complete a project, and benefited from working in an environment where all students could see each others' work. McGarvey (2010) studied the identity formations and literacy practices of six urban high school students while they interacted within the school's Blackboard Learning Management System and the MySpace SNS. The websites became an indispensable part of the participants' social and academic lives, as the students used the sites as spaces for formation of and experimentation with their identities, to practice multiple identities, and express future aspirations. The students demonstrated various social and academic literacies including the abilities to navigate and manage complex social relationships and critically analyze

texts by interacting with others within their academic environment (McGarvey, 2010).

Ahn (2010) completed one of the first large studies of SNS use in a K-12 setting, accessing 50 classrooms and nearly 1,400 students who were randomly assigned to use an experimental social network site. In one of the first attempts to experimentally discern any social and learning effects of SNS on teenage youth, a cluster-randomized trial was used to explore potential beneficial impacts of SNS use in high school classrooms. The results of the study suggested that school-imposed social networks will be poorly received by students, and will have no significant effect, or possibly, negative effects, on student-school relationships, engagement, and GPA. In contrast, students' existing social networks on sites such as Facebook and MySpace appear useful to efforts at improving student relationships with peers, teachers, and the larger school community (Ahn, 2010).

SNS use in K-12 settings is rare, and the hurdles associated with access and consent remain daunting to teachers and researchers alike. In spite of this, the National School Boards Association study (2007) found that schools and parents expected social networking technologies to play positive roles in students' lives. School district leaders hoped that social networking will help students learn to think in new and creative ways and express themselves creatively. Almost half (48%, n=250) expected social networking to introduce students to new and different kinds of students and develop global relationships. However, district leaders remained skeptical about the educational value of social networking, and only 29% believed that social networking could help students improve their reading, writing, or clarity of expression. Somewhat more of them (36%) hoped that social networking would help students learn to solve academic problems through collaborative work. Parents had higher expectations, and 76% (n=1039) of them

expected social networking to help their children improve their reading and writing skills or express themselves more clearly. A majority of parents (75%) also expected social networking to improve children's ability to resolve conflicts and improve their children's social skills (72%).

In the case of older students in higher education contexts, it is clear that social network site use, and social media use in general, is becoming an integral part of the campus experience (Smith & Caruso, 2010). In the 2010 edition of the Educause Center for Applied Research study of undergraduate students and information technology (N=36,590), 95% of 18- and 19-year old university undergraduates reported using social network sites for a variety of purposes, with 29% of the respondents using the sites in their university courses (Smith & Caruso, 2010). Regarding research on SNS use in higher education, Facebook, perhaps because of its initial orientation towards college-age students, has been a popular topic. Some of the early work in this area has been concerned with the use of Facebook by higher education faculty. Mazer, Murphy, & Simonds (2007) studied the effect of faculty Facebook participation on student-professor relations and found that increased teacher self-disclosure on the website was associated with student reports of more motivation, higher levels of perceived teacher credibility, and increased learning.

In another study of students perceptions of faculty Facebook use, Roblyer, McDaniel, Webb, Herman, and Witty (2010) found that most students would not feel a threat to their privacy if faculty were to encourage educational uses of Facebook. Instead, the students reported having more interest than their instructors in the educational use of Facebook. This corresponds with findings from work by Moran, Seaman, and Tinti-Kane

(2011), who noted that, while 77% of surveyed faculty (n=1,920) reported personal use of social media, and 60% used social media in class, only 4% reported using Facebook in class. Similarly, Smith and Caruso (2010) also found faculty to be slow to adapt the use of social network websites for coursework.

However, even if they do not readily use them in class, many higher education faculty recognize the utility of SNS, and use them for professional communication purposes. Murai et al. (2007) examined the use of a social network site by Japanese K-12 teachers and found that teachers felt that the site could open useful lines of communication and knowledge sharing between geographically separated teachers who faced challenges common to the nation's education system as a whole. Forkosh-Baruch and Hershkovitz (2012) reported on the use of SNS and Twitter for scholarly purposes by Israeli higher-education institutes, where the social network tools were deployed as a means of empowering informal learning by facilitating institutional and scholarly sharing of resources with the community at large. Their research revealed that, even though sharing was taking place, the official SNS accounts of higher-education institutes were not being used to their full potential. When these sites are used to freely share scholarly, academic, and professional information, they have the potential to become fertile ground for content consumption and the creation of unique online scholarly social environment for students as well as for the general community.

Several studies have investigated the relationship between SNS use and student engagement. The Center for Community College Student Engagement (2009) reported that survey data gathered from over 400,000 students at 663 U. S. and Canadian institutions indicated that only 18% of younger (18-24 year old) students and 10% of

older students (>24 years old) used social media tools such as Facebook, Twitter, texting and instant messaging for school-related purposes. However, students who did use social media tools for schoolwork tended to score higher on engagement benchmarks than those who only used the tools for other purposes, and did so frequently. A study by Heiberger and Harper (2008) comparing Facebook use by undergraduate students (n=377) with their activities at school revealed a positive correlation between SNS use and engagement based on the finding that heavier SNS users spent more time participating in campus organizations than light users.

A study by the Higher Education Research Institute (2007) drew on the "Your First College Year" survey (n=31,000) to examine the use of SNS by college freshman and found that nearly sixty percent of the students spent between one and five hours a week on the sites. The study found that students who spent more time on social network sites were more likely to be satisfied with their social lives, but also reported slightly higher levels of difficulty in developing effective study skills and managing their time. In regards to engagement specifically with academic concerns, a study by Junco (2012) revealed that the particular type of activities students engaged in on Facebook, rather than time spent on the site, was a stronger predictor of engagement, time spent preparing for class, and time spent in co-curricular activities. Overall time spent on the site and number of visits to the site were both negatively predictive of engagement scale scores, as were frequency of playing games and checking up on friends. However, commenting on content and creating or responding to event announcements positively predicted engagement scale scores. Junco (2012) proposed that students would use Facebook in ways both positively and negatively related to their engagement, studying, and on-

campus involvement.

Social network sites are important to the socialization processes of students within the university environment. Ellison, Steinfield, and Lampe (2007) surveyed 286 college undergraduates and found Facebook use to be associated with the accumulation of higher levels of three types of social capital: bridging capital (friends of friends that afford diverse perspectives and new information), bonding capital that comes from close friends and family, and maintained social capital, or the ability to mobilize resources from previously inhabited networks such as former schools. Yu, Tian, Vogel, and Kwok, (2012) analyzed the relationship between the Facebook use of 187 business major undergraduates and their acculturation, socialization and satisfaction in university life, along with performance proficiency and learning outcomes. Results indicated that impacts from online social networking on the social dimension of students' learning led to increased self-esteem, satisfaction with university life, and performance proficiency. "The online social networking site provides university students with a new mode for learning through which they foster psychological well-being and learn skills for academic or future career success" (Yu et al., 2012, p. 1499). The increased social acceptance individuals gained through peer interaction supported by the SNS influenced cognitive and skill-based learning, while acculturation in the university shaped by interaction with the situated environment had a greater effect on their satisfaction with university life (Yu et al., 2012).

Research into the direct classroom use of social network sites as part of applied pedagogy is now beginning to enter the literature base, although most of these projects are small case studies. Many instructors are using the sites, often attracted by the

possibility of leveraging an SNS to enhance communication and community building in their online and hybrid classes. However, the SNS phenomenon is still new, and research momentum is just getting underway with numerous case studies and single-class action research projects appearing initially, and more dissertation-level work becoming available since about 2009.

Kelley (2010a) examined the effect of deploying an American-based SNS in a Chinese English as a Foreign Language class in terms of self-reported student attitudes toward motivation. Students using the SNS showed a statistically significant increase in integrative motivation orientation, and registered significant changes in regards to attitudes toward speakers of the target language (English) and cultural interest. Kelley (2010a) contended that the SNS acted as a kind of imagined community for the students, and allowed them to create a virtual context in which contact with foreign media and L2 speakers impacted their attitudes toward English learning and motivation.

DeSchryver, Mishra, Koehleer, and Francis (2009) investigated the effect of using Facebook for discussions in an online course and found no difference between the Facebook and Moodle LMS discussion spaces in terms of student perceptions of social presence and the frequency and length of their discussion interactions. Schroeder and Greenbowe (2009), working with a population of 128 undergraduate students enrolled in an introductory organic chemistry laboratory for non-chemistry majors, explored the effectiveness of Facebook in comparison to Web CT for encouraging discussion of chemical concepts outside of regular class time. Although only 41% of the students joined the Facebook group, the number of posts on Facebook was nearly 400% greater than the number on WebCT, and the postings themselves raised more complex topics and

generated more detailed replies. Facebook was frequently used to communicate about upcoming assignment, ask for assistance from the instructor or other students, or discuss approaches to problems and offer suggestions.

Many studies of SNS use as a component of coursework are taking place in the context of graduate programs, especially in teacher education programs, and in courses on the use of educational technology. This makes sense, as pre-service teachers need to engage in experiential learning with the technology that they will later be using in classrooms (Arnold & Paulus, 2010). The sites have been in active use by educators for several years as centers for professional development, as witnessed by the use of such teacher- and education-specific SNS as sites for data gathering in this research project. Social network sites can provide both pre-service and in-service teachers with a place to network, share teaching experiences, access peer mentoring, and produce and share resources both widely and in topic-specific groups. An SNS can offer support to teachers who may be isolated as the only instructor teaching a particular course at their institution. An educators' SNS can offer such teachers the opportunity to be part of an information-sharing network instead of working in isolation (Bryant, 2006).

Kurhila (2006) conducted a study of the use of SNS by graduate students to augment information gathering for research projects and other tasks related to graduate studies; these students felt that the sites were useful but not entirely dependable as resources. Stepanyan, Mather, and Payne (2007) reported that student engagement with social network software was dependent upon the degree to which the use of the SNS was integrated into course design. Waggoner and Carroll (2008) found that the use of social software in a teacher education course produced inconclusive results, with the benefits of

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the technology for producing collaboration appearing to be tied to the innate disposition

of the group toward collaboration. Likewise, Velasquez et al. (2009) used social

networking in three pre-service teacher education courses with mixed results. Students

perceived many benefits, but some did not enjoy using the social networking tools,

perceiving a loss of separation between social and academic aspects of their lives and

experiencing difficulty in learning to use the software.

Arnold and Paulus (2010) describe the use of a Ning SNS as an experiential

learning component of a university teacher education course on computer assisted

language learning. The SNS served the intended use as an information repository, and

met expectations for the promotion of collaborative reflection on and review of course

work. Unplanned collateral outcomes of SNS use included the appropriation of SNS

features by the students for use in ways not planned by the instructor. Students expanded

the use of the SNS tool to meet their own needs for a space to examine models of course

work, read the work of others, provide feedback, engage in conversation, and build

community. Study participants reacted positively to the SNS use, and regarded the Ning

site as a good alternative to the institutional Blackboard LMS.

Yuen and Yuen (2008) conducted a case study of the use of a Ning social network

site in a graduate-level hybrid course on instructional technology and found that

participants expressed positive and favorable feelings regarding the educational use of

social network sites. Fitzgibbon, Oldham, and Johnston (2007) studied the connection

between student-teachers' use of Bebo and MySpace and their view of the potential of

technology for teaching and learning. They found that participants' perceptions of

technology use in learning and the classroom were not related to the use or non-use of

social network sites.

Holcomb, Brady, and Smith (2010) assessed students' attitudes towards the use of a Ning SNS in distance education by surveying 50 graduate students enrolled in one fully asynchronous distance education instructional technology course and two hybrid, synchronous distance education educational leadership preparation courses. Majorities of respondents felt that the SNS afforded increased frequency of peer collaboration and aided communication outside the traditional confines of the classroom. The SNS was viewed as providing a forum for networking and collaboration beyond the immediate class group, and most students expressed the desire to use an SNS as a means for communicating and sharing ideas in future courses.

Hildebrandt (2011) worked with students in an online doctoral program to investigate features their experience including their sense of belonging, participation in scholarly activities, and level of interaction with faculty, as well as their perceptions of the value of social network site use in increasing students' sense of belonging and participation. Results indicated that most of the students were already SNS users before the course began, liked the use of the SNS in the course, and were in favor of seeing future academic activities carried out within a social network site. The participants viewed an SNS as a means of keeping in touch with friends and classmates, strengthening the sense of being part of a community, and meeting others with similar research interests.

In contrast to higher education and teacher training contexts, there are many difficulties associated with SNS use in the K-12 setting. Online safety, security, and privacy are major considerations that burden administrators, teachers, and parents, as are federal and state regulations concerning the use of the Internet in school by young

students. However, an increasing range of social media and online learning products especially designed for the K-12 environment are coming online. If the predicted growth in K-12 online education enrollment materializes, social network sites deployed as elements of a Personal Learning Environment approach are likely to be key delivery tools.

Key Educational Affordances of Social Network Sites

During the survey of literature related to social network sites in general, and social network sites in education, three themes emerged in regard to useful affordances these tools can provide in educational contexts: (a) support for various types of organization and interaction in digitally-mediated environments; (b) support for the projection of individual social presence in digitally-mediated environments; and (c) support for ongoing awareness and transparency among learners working in online and blended courses.

Social infrastructures and learning.

Learners in the online environment may build and maintain communities of learning by engaging in many of the processes and behaviors associated with offline communities (Haythornthwaite et al. 2004; Kazmer, 2004), including sharing common meeting places and histories; supporting common goals and commitment to the purposes of the community; establishing identity and membership markers and rituals; taking positions in hierarchies of expertise; and socially constructing rules and behaviors (Bruckman, 1998; Curtis, 1997; Donath, 1999; Jones, 1998; King, Grinter, & Pickering, 1997; Kollock & Smith, 1999; Mynatt, O'Day, Adler, & Ito, 1998).

Although community building can occur in online environments, and has been generally accepted as an important support for learning, there is a variety of other online

relational structures that are being examined in relation to learning. Social network

websites such as MySpace, Facebook, Bebo, and Ning are used to build online networks

among people (Dalsgaard, 2008), and Dalsgaard and Paulsen (2009) express the idea that

social networking technologies have actualized questions regarding the type of social

infrastructures that best support learning. The specific potentials of different forms of

social interaction (i.e., groups, communities, collectives, connections, and networks) have

become a subject of ongoing debate (Dron & Anderson, 2007; Wenger, 1999; Anderson,

2008; Jones, Ferreday, & Hodgson, 2006; Siemens, 2004b). The debate originates in the

concept of network, which challenges several of the other forms of social relation

(Dalsgaard & Paulsen, 2009).

> Networks are defined as individual networks consisting of the relations of an
>
> individual. Each individual will have his/her own unique relations. People rarely
>
> have the exact same relations, and thus, people will have unique networks.
>
> Communities, on the other hand, are spaces shared by a group of people. In other
>
> words, a community is shared and collective, whereas networks are individual.
>
> (Dalsgaard, 2008 p. 4)

Past research and practice in the area of e-learning has primarily focused on

groups: defined collections of individuals who see themselves as part of the group in

question, and who are engaged in some type of joint work (Dron & Anderson, 2007).

This definition may not be applicable to all learners in online and blended learning

contexts unless the concept of joint work is greatly expanded to include, for example,

those who are merely enrolled in the same course but have no other significant contact

(Dalsgaard, 2008).

Other social learning constructs such as Wenger's (1999) communities of practice and the tradition of computer supported collaborative learning (CSCL), are criticized as not being able to describe the variety of relations that may exist within online learning environments (Jones et al., 2006). These earlier constructs have focused on participation, collaboration, and negotiation of meaning (Wenger, 1999), which are all based on tight-knit structures. Particularly within the CSCL model, the use of technology in support of groups and communities of practice has been focused on collaboration, with a corresponding emphsais on developing and supporting tight-knit social structures (Dalsgaard & Paulsen, 2009; Jones et al., 2006). Dalsgaard & Paulsen (2009) see the concept of networks (as per Dron & Anderson, 2007: loosely organized structures in which people do not necessarily collaborate or communicate directly), as challenging the concept of tight-knit social constructs that is embodied by the community model.

This sort of debate around questions concerning the role networks play in regard to learning has produced the conclusion that there is a form of social interaction – social networking – that is not easily explained by learning theories. Further questions revolve around discovering what kinds of relations support learning, and how networks in particular support learning. Jones et al. (2006) connect networking and learning through the use of the concept of networked learning. Networked learning doesn't privilege any particular types of relationships between people or between people and resources. Instead, facilitating connections among learners, between learners and tutors, and between learners and resources is of primary importance. However, the networked learning concept does not establish a theory regarding which specific types of relationships should be supported (Dalsgaard & Paulsen, 2009). While studies within networked learning have

focused primarily on strong links, weak ties may be more important (Granovetter, 1973; Jones et al., 2006). A unique feature of social networking software is the fact that it supports weak ties (Dalsgaard & Paulsen, 2009), as well as offering support for the development of a variety of other interaction structures among its users.

Presence in the online environment.

As outlined by Garrison and Anderson (2003), there are three aspects of presence that make an important contribution to the meaningful online educational experience. The foundational aspect is social presence, comprised of the co-presence of students and teacher in the learning space, and their ability to project themselves socially and emotionally in that space (Garrison & Anderson, 2003; Gunawardena & McIsaacs, 2004; Short, Williams, & Christie, 1976). Social presence is the degree to which a person feels present, or the degree to which a person is perceived as a real person in mediated situations and communications (Short et al., 1976). Short et al., (1976) have also proposed a receptive view of social presence that encompasses individual perception of engagement in interpersonal communication despite the participants being separated by distance, and the communication being digitally mediated. This ability is supported by "absent presence", or a sense of presence based on the human ability to manufacture feelings of connection and interaction between people separated by distance (Wheeler, 2005). This is accomplished by hearing vocal inflections, paraverbal utterances, and ambient sounds in audio communications, via textual cues and non-verbal devices such as emoticons, images, and other visual cues (Wheeler, 2005).

The establishment of social presence enhances and sustains cognitive presence (Stacey, 2001). Cognitive presence denotes learners' capability for the construction and

confirmation of meaning through sustained reflection and discourse (Garrison &
Anderson, 2003). Cognitive presence is a condition of higher-order thinking and learning,
and is therefore associated with critical communities of inquiry, constructivist learning,
and levels of content engagement among learners within the course (Garrison &
Anderson, 2003).

Finally, teaching presence refers to the need for an architect and facilitator to
effect the design, facilitation and direction of cognitive and social processes in a manner
that leads to personally meaningful and educationally worthwhile learning outcomes
(Garrison & Anderson, 2003; Garrison, Anderson, & Archer, 2001; Garrison, Cleveland-
Innes, & Fung, 2004; Rovai et al., 2008).

As a prerequisite for the establishment and maintenance of cognitive presence
(Stacey, 2001), social presence is becoming an important concept within the body of
research into learning with online media. Social presence is necessary to the creation of a
climate that supports the productive computer-mediated communication that leads to the
accomplishment of shared educational objectives (Garrison & Anderson, 2003;
Gunawardena & Mc Isaacs, 2004; Gunawardena & Zittle, 1997; Rovai et al., 2008; Tu &
Corry, 2002). Social presence is associated with involvement in the online learning
environment, and with the feelings of community and connection among learners that
may contribute positively to both learning outcomes and learner satisfaction with online
courses (Kazmer, 2000; Tu & Corry, 2002). Three dimensions of social presence, (a)
social context, (b) online communication, and (c) interaction, have been identified (Tu &
Corry, 2002) and linked with student perceptions of learning (Picciano, 2002), and
student satisfaction with online courses (Gunawardena & Zittle, 1997).

Social presence is comprised of a number of factors related to the degree of interpersonal contact between people including "intimacy" and "immediacy" (Short et al., 1976). Intimacy is based on variables such as physical distance, eye contact, and facial expression, while immediacy is a measure of the psychological distance between a communicator and the object of his/her communication (Gunawardena & McIsaacs, 2004). In the face-to-face classroom, participants can establish social presence merely by the act of showing up. In the online learning environment, social presence is not supported by scheduled physical proximity and participants have traditionally faced the challenge of presenting not only thoughts and ideas but also their personas primarily via the medium of persistent text (Garrison & Anderson, 2003; Haythornthwaite & Bregman, 2004).

Although emotionally-invested personal relationships and close bonds can be established in purely text-based interaction contexts (Rheingold, 1993), text-based computer-mediated-communication offers few nonverbal cues to relational information, and ranks low among media that are capable of generating intimacy (Gunawardena & McIsaacs, 2004). This type of online environment may not be ideally conducive to the formation of personal presence. For example, text-based interaction environments may be more accessible to individuals of a certain personality type, or may present obstacles to facile and efficient establishment of social presence. Particular aspects of human contact and communication are biologically based, and are not supported by text-only communication. In one study, the levels of stress and comfort perceived by youg children, and the hormonal signals associated with each, were found to vary with face-to-face, voice only, and text only communication (Seltzer, Prososki, Ziegler, & Pollak, 2012).

When compared with face-to-face and voice-only communication, text-based communication did not appear to have as much decremental effect on the presence of the stress hormone cortisol and positive effect on the oxcytocin production associated with feelings of well-being (Seltzer et al., 2012).

If a closer approximation of face-to-face communication will lead participants in online education environments more readily to the establishment of psychologically and biologically authentic communicative interactions and a sense of full social presence, tools that support such communication should be provided to virtual learning communities. The types of social media software commonly associated with social network sites offer many features that are suited to this task. For example, blogs and discussion forums now easily go beyond text to support the publishing of visual and audio elements, and can be used as collaborative work spaces to support the type of asynchronous online collaboration that is associated with "increased learner interaction, satisfaction, and learning" (Murphy, Drabier, & Epps, 1998, p. 2). Synchronous chat and video/audio transmission features support full face-to-face communication, and enable various degrees of immediacy, the psychological distance present between principals in communicative interaction that is a factor in the projection of social presence (Gunawardena & McIsaacs, 2004). Taken as a whole, the affordances of Web 2.0 tools and social media are leading to a blurring of boundaries between the asynchronous and synchronous modes of online interaction.

These now-standard communication and personal publishing tools, though useful, are not components uniquely associated with SNS software. It is the personal profile page that sets the SNS environment apart from other tools used for structuring the computer-

mediated learning environment (Dalsgaard, 2006, 2008). The page owner can alter the look and function of the page, add text, pictures, audio-video media, and software applications, and update the profile that presents personal information. Thus, the personal page represents a space for the personalization, creation, and expression that supports the establishment of individual social presence in the virtual environment (Dalsgaard & Paulsen, 2009; Garrison & Anderson, 2003).

The page is not personal in the sense that it is private; it can be made public to other people in the individual's network and to larger audiences if so desired. As the personal page is shared in the public spaces of the social network site, it serves an important function as the individual's personal representation on the web. As Dalsgaard (2008) notes, social network sites are radically different from discussion groups and other community based tools because they allow learners to maintain a constant presence and visibility within the online environment. In contrast to discussion forums, where individuals are represented solely by their posts and are dependent on posting for visibility, on a social network site, presence is constantly maintained through the personal page (Dalsgaard & Paulsen, 2009). This steady maintenance constitutes an amplification of the individual social presence that Wheeler refers to as "a vitally important component of any learning situation, and doubly so in electronically mediated contexts" (2005, p. 6).

Transparency.

Dalsgaard (2008), working from a socio-cultural perspective that makes a connection between learning and various types of social relations, notes that individual learning activities are always situated in a collective practice because they serve an objective that relates to an overall collective activity. The activities are therefore

collective, and are related to and gain meaning in relation to the activities of other individuals. However, since these collective activities do not necessarily take place in tightly-knitted groups or communities, relations between activities may be such that the individual is not aware of the activities of others in the collective. Therefore, "An important objective within a learning environment is to support consciousness and awareness of activities of others. This awareness is important to support an individual's reflection on his/her own activities in relation to others' activities" (Dalsgaard, 2008, p. 3).

When viewed from this socio-cultural perspective, a primary affordance of the educational social network site is the provision of increased awareness of and insight into the activities of other individuals within the network (Dalsgaard, 2008; Dalsgaard & Paulsen, 2009). Dalsgaard (2006, 2008) describes this awareness of the activities of other members of a learning collective as a matter of transparency, and argues that a primary pedagogical potential of educational social software lies in the ability to create transparency and mutual awareness between students separated by time and distance.

Unlike discussion forums and other tools for direct communication and collaboration that focus on explicit sharing in online environments, social network sites can also support students' indirect sharing of resources, thoughts, ideas, productions, writings, notes, etc. (Dalsgaard, 2008). In contrast to discussion forums in which communication always takes place in a shared space, in the context of an SNS, the starting point is the individual as represented by the personal page. Thus, on the SNS, people do not necessarily need to produce messages or documents in order to communicate or share with other users. Instead, they can update their profile, and/or

modify or add material to their page or other personal space. As other people view these pages and follow the activities of their friends, a kind of indirect or passive form of communication and sharing takes place (Dalsgaard, 2008; Dalsgaard & Paulsen, 2009).

Students who work at a distance and individually are not necessarily aware of the activities of other students. However, students within a course share context and have a common background in the sense that they are reading the same texts and working on similar problems within the same field. The students in a shared context understand each other to a large extent, and in their individual work at writing notes, searching for literature, finding relevant websites, writing assignments, and so on, they produce information and products that are relevant to all course participants (Dalsgaard, 2006, 2008). The principle of transparency implies that, even in the absence of explicit communicative activity, students should have insight into each other's work, thoughts, and productions (Dalsgaard; Dalsgaard & Paulsen, 2009). Social software tools can be used to make students' individual work visible to all course participants, allowing students to follow each other's work and turning a network of individual people and separated resource sets into a shared resource (Dalsgaard, 2006).

Summary of Literature Review

Although punditry on all things social media abounds, and is expanding at an accelerating pace, the body of research-based literature focused on social network sites as teaching and learning tools has the raw and fragmented feel of a new field. The atmosphere in the literature surrounding this technology is reminiscent of the early years of the Internet itself. The emerging paradigm is so disruptive that a majority of older people tend to view it with fear and mistrust. These emotions result in limitations in the

access afforded to young people, including large-scale restrictions on social media use in the form of school-wide bans and/or the implementation of filtering and blocking technologies, and so forth (boyd, 2008). Meanwhile, young people have readily grasped the technology and made it a part of their daily lives. This creates a classic example of gap between the visionary minority who are early adopters of a technology and the pragmatic majority (Moore, 1991).

There is a pressing need for research and development that will allow the closing of that gap. Although web-enabled research allows a researcher to access and examine an abundance of material relative to time invested, the 3-plus years of research and readings related to Web 2.0 and social media comprised by this literature review produced no example of a fully-developed analysis of instructors' viewpoints regarding the deployment of social network sites as components of either face-to-face, hybrid, or fully online courses at any level of education. However, the extant literature did support the development of a general conceptual framework regarding this technology. Following are the primary concepts developed from a search of the literature on the topic at hand:

- Social media and social networking technologies have altered the structure of the online environment, changed the relationship between people and the Internet, and enhanced the potential for useful deployment of networked digital tools in educational contexts.

- A substantial portion of current and future students will be familiar with and amenable to using social media software and social network technologies in educational contexts.

- Learning community development can lead to enhanced educational outcomes.

- Learning communities can be developed in online distance-delivery contexts, and may be of particular necessity in those contexts.

- Social media software and social network sites can support learning community development in the online environment.

- In addition to communities, a variety of other potential relational organizations may exist between users working with and in online environments. Social network sites offer capabilities that can be used to support several types of organizational and interactional structures.

- Social presence underlies cognitive presence and teaching presence, and is an influential factor in the successful delivery of online education. In online environments, any support that can be offered for the establishment and maintenance of social presence is likely to have a positive effect on learning outcomes. Social media software and social network websites do afford the establishment and maintenance of social presence.

- The enabling of transparency, or awareness of the productions and presence of others in the online environment, can be a beneficial factor in digitally-mediated education delivery. Social media software and social network websites do afford transparency.

- Educators are increasingly familiar with and interested in social media software and social network technologies, and many are currently experimenting with these tools in their daily practices.

- Formal study of the use of SNS in educational contexts is needed.

CHAPTER 3. METHODOLOGY AND PROCEDURES

Statement of the Problem

Social network sites are distinguished from other types of social media technology by their support for personal profile pages that allow for implicit communication, personal expression, and the maintenance of a constant social presence in an online environment (Anderson, 2005a; Dalsgaard & Paulsen, 2009; Garrison & Anderson, 2003). These sites are very popular among teens 12 to 17 years old (Lenhart, 2009; Lenhart et al., 2007). In addition, over the past four years, a nearly consistent 95% of 18- and 19-year-old respondents in the EDUCAUSE Applied Research (ECAR) study of undergraduate students and information technology have reported using social network sites (Smith & Caruso, 2010). There has also been a steady increase in the use of these sites by students aged 25 and older (Smith & Caruso, 2010). Smith and Caruso report that "Because today's high school and college-age students have been adopting social networking and content sharing at such high rates, higher education has an opportunity to leverage these technologies" (2010, p. 78). Social network sites have the potential to be useful in a wide variety of education and training contexts because they can contribute to sound pedagogical approaches and offer learners access to educational experiences based around active participation rather than passive reception (Bedard, 2009; Dalsgaard, 2006; Dron, 2006; Ferdig, 2007; Fitzgerald, et al., 2009; Martin & Crawford, 2008; Selwyn & Grant, 2009).

The use of social network sites as components of education delivery is a phenomenon that is still in the early stages of development (Vie, 2008). The educational use of these tools and the pedagogies around that use represent new research territories.

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The intersection between the educational realm and online social network sites remains surrounded by a haze of confusion, fear, and bias that needs to be penetrated by educational researchers (boyd, 2008; Ewbank et al., 2008; Hargadon, 2009; Saunders, 2008; Simonson, 2008). Negative discourses have developed around concerns that social software use may contribute to heightened disengagement, alienation, and disconnection of learners from education, while negatively affecting "traditional" skills and literacies (Selwyn & Grant, 2009). This has lead to a situation in which the educational application of social software is the subject of debate and controversy. Some educators think that the use of social networking and other online collaboration tools may enhance the relevance of school for students, and improve information sharing and communication among students and school staff (Abramson, 2011; Selwyn, 2006). However, there remains a perceived lack of adequate policy for the appropriate use of social networking for educational purposes, particularly in K-12 settings ("Schools still conflicted", 2010). James Bosco, principal investigator for the Consortium for School Networking project summarized the situation:

> It's one thing to say, 'We'll use Web 2.0 and digital media so long as it conforms to what we have been doing in the past.' It's another thing to recognize that the real message is that we have to think differently about learning, and about the roles of teachers and student - that's the big challenge. ("Schools still conflicted," 2010, p. 1).

These controversies are in part expressions of a growing frustration amongst some elements of the education community over the fact that much of either the enthusiasm or moral panic currently surrounding social software is based on scant solid evidence

(Selwyn & Grant, 2009). There is a need for data generated by theoretically driven empirical research (Dutton, 2008); information that can be used to answer questions concerning what is actually taking place when social software technologies meet education. There is a clear demand for scholarly work that can ascertain truth among the many poorly-supported conceptions and concerns surrounding social media technology (Beer, 2008; boyd & Ellison, 2007; Hemmi et al., 2009; Simonson, 2008). This study was intended to begin the work of establishing more precisely the affordances, benefits, and drawbacks of deploying a particular type of social media, the social network site, as a component of online or hybrid course delivery methodology in formal education and training contexts.

Purpose of the Study

The purpose of this study was the exploration of instructors' use of social network sites as tools for teaching and learning, the provision of insight into a paradigm shift that is occurring in the realm of digitally-mediated education delivery, and the creation of a conceptual map modeling the use of social network software in support of constructivist learning approaches.

Research Questions

This purpose was accomplished via a mixed-methods (Creswell & Plano-Clark, 2007) study guided by the following research questions:

1. What are educators' perceptions regarding the general utility, benefits, and drawbacks of social network sites as educational tools?

2. What are the views of concerned experts and classroom teachers experienced with the use of social network sites in their practice in regard to the potential of this technology to

engender paradigmatic change in educational domains?

3. To what extent do these data enable the development of a model for the use of social network sites in teaching and learning?

Research Design

The research design was based in general principles of data gathering and analysis taken from the literature on quantitative and qualitative survey item design (Fink, 2003a, 2003b; Fraenkel & Wallen, 2006; Patten, 2001; Weber, 1990), qualitative content analysis (Corbin & Strauss, 2008; Cresswell, 2005, 2007; Denzin & Lincoln, 2008; Fink, 2003a, 2003b; Gay, Mills, & Airasian, 2006; Neuendorf, 2002; Strauss & Corbin, 1990; Strauss & Corbin, 1997), and Grounded Theory (GT) research (Bryant & Charmaz, 2007; Charmaz, 2006; Corbin & Strauss, 2008; Cresswell, 2005, 2007; Gay, Mills, & Airasian, 2006; Glaser, 1978; Glaser & Strauss, 1967; Strauss & Corbin, 1990; Strauss & Corbin, 1997).

This study constituted mixed-methods research as per Creswell and Plano-Clark in that the study involved "collecting, analyzing, and mixing both quantitative and qualitative data in a single study" (2007, p. 5). This mixing of data types can provide a more detailed description of the phenomena under study, and offer countering advantages to offset any weaknesses inherent in the individual methodologies (Creswell & Plano-Clark, 2007). Johnson and Onwuegbuzie (2004) contend that mixed-method designs for empirical research support a methodological pluralism that may result in outcomes superior to those obtained via mono-method research. Denzin and Lincon (2008) describe the combination of multiple methodological practices, empirical materials, perspectives, and observers in a single study as a strategy that adds rigor, breadth, complexity, richness,

and depth to the inquiry.

The postpositivist viewpoint associated with qualitative research entails the recognition that reality can never be fully apprehended, only approximated (Guba, 1990). Thus, multiple methods are relied on as a way of capturing as much of reality as possible, while emphasizing the discovery and verification of theories (Denzin & Lincoln, 2008). Traditional evaluation criteria such as internal and external validity are stressed, along with the use of qualitative procedures that lend themselves to structured, sometimes statistical, analysis (Denzin & Lincoln, 2008). Basic quantitative analytic techniques may be employed, including computer assisted methods that permit frequency counts, tabulations, and low-level statistical analysis (Denzin & Lincoln, 2008).

The research design was operationalized via (1) the use of primary Internet research methodology (Hewson, 2003) to recruit participants, develop and administer data collection instruments, and collect responses and (2) the application of both qualitative and quantitative analytic methodologies to the data collected. Data collection approaches included: (a) the use of an online nominal group technique in the development of a qualitative survey focused on generating answers to the research questions, (b) the deployment of an online survey data collection instrument, and (c) a thematic analysis of recent web log posts written by experts on social media and focused on the use of social network websites in education.

To facilitate the development of an analytic methodology that could be applied to qualitative data derived from responses to open-ended questions included in the survey instrument (see Appendix C), a conceptual framework was drawn from general principles of qualitative analysis (Corbin & Strauss, 2008; Cresswell, 2005, 2007; Denzin &

Lincoln, 2008; Fink, 2003a, 2003b; Gay, Mills, & Airasian, 2006) and specifically grounded theory (GT) research (Bryant & Charmaz, 2007; Charmaz, 2006; Corbin & Strauss, 2008; Glaser, 1978; Glaser & Strauss, 1967; Strauss & Corbin, 1990; Strauss & Corbin, 1997). GT methods evolved from the systematic data analysis strategies developed in the early 1960s by sociologists Barney G. Glaser and Anselm Strauss during their collaborative studies of terminally ill patients dying in hospitals (Charmaz, 2006). First articulated in "The Discovery of Grounded Theory" (Glaser & Strauss, 1967), these strategies advocated the discovery of theory via the inductive analysis of qualitative data (Charmaz, 2006; Glaser & Strauss, 1967).

As outlined by Charmaz (2006), GT methods are operationalized by the gathering of data in the form of observations, interactions, and materials relevant to and arising from the research topic or setting. The data are analyzed, separated, and sorted by means of codes that depict what the data are about. Coding is carried out in three general phases: (a) open coding that develops categories of information from the data, (b) axial coding that interconnects the categories, and (c) selective coding that builds a story that connects the categories and leads to a discursive set of theoretical propositions (Strauss & Corbin, 1990). These successive levels of analysis are used to refine the categories and establish relationships between them.

> Coding means that we attach labels to segments of data that depict what each
> segment is about. Coding distills data, sorts them, and gives us a handle for
> making comparisons with other segments of data…Our analytic categories
> and the relationships we draw between them provide a conceptual handle on
> the studied experience. (Charmaz, 2006, p. 3)

Population and Sampling

This study was conducted on the Internet and within the world-wide-web. The highly distributed and viral nature of Internet-facilitated communication implied a research population theoretically consisting of all individuals worldwide who had Internet access. It is likely that respondents to this survey were members of a sub-population consisting of those Internet users having an interest in using social media and social network sites as teaching and learning tools. The sample was a self-selected convenience sample, consisting of those members of the potential population who had access to, and chose to complete, the online survey instrument.

Convenience sampling is often used in education research because it is an appropriate approach to situations where there is a match between the characteristics of a specific group of individuals and the attributes of a phenomenon being studied (McMillan & Schumacher, 2006). A response rate was not calculated; as per Schonlau, Fricker, and Elliott (2002) response rates cannot be computed when respondents are recruited through convenience sampling; for example, through advertising or with a survey that is simply posted on the Web for anyone to complete. Schonlau et al. (2002) go on to note that, although convenience samples generally do not support statistical inference, convenience sampling can be useful in a number of ways. For instance, in defining response categories for multiple-choice questions or collecting other types of non-inferential data, or, as in the present case, to develop hypotheses and identify issues surrounding a topic during the early stages of research. In some types of qualitative research, Web-generated convenience samples may be just as valid as convenience samples that are generated using other modes (Schonlau et al., 2002).

Instrumentation and Validation

Instrumentation

The primary data collection instrument used in this study was an observational survey of cross-sectional design intended to provide descriptive data regarding the point in time at which it was administered (Fink, 2003a, 2003b; Fraenkl & Wallen, 2006; Schutt, 2004). The survey was designed to collect data suitable to the application of both quantitative and qualitative analytic techniques. The survey consisted of an eight-item demographic section followed by a twenty-item section focusing on the use of social software in the delivery of education and training (see Appendix C). Respondents were presented with a mix of structured- and unstructured response items. The structured response items were based on a variety of nominal and ordinal scales (see Table 3). A final open-ended comment item invited respondents to give their opinion on the educational use of social network software in a 150-character or less micro-blog format.

Validation

The varied nature of the items and response scales employed in this survey instrument, along with the manner in which the instrument was to be applied, precluded the use of common statistical techniques in the establishment of reliability and validity. Instead, a focus on face validity was called for, and this effort was applied during the development process with the intention of ensuring that all needed questions were presented clearly and comprehensibly, with appropriate language and generally familiar terminology used throughout (Fink, 2003a). The first step in establishing face validity was the application of proven survey development tenets. The basic development process applied to the design of this web survey was similar to what would be used with any

Table 3

Data Collection Instrument Item Types

Quantitative	Qualitative
Nominal Scale Items	Text Input Items
Item #s 1, 2, 3, 4, 5, 6, 7, 8, 9	Item #s 10, 11, 12, 15, 17, 19, 21, 22, 23, 24, 25, 26, 27, 28
Ordinal Scale items	
Item #s 13 (13.1 - 13.20), 14, 16, 18, 20	

other survey medium, and included:

1. Defining the survey objectives, including:

- specifying the population of interest;

- delineating the type of data to be collected;

- determining the desired precision of the results.

2. Determining who will be sampled, including:

- specifying the method of sample selection (probability-based or

    convenience-based);

- selecting the sample.

3. Creating and testing the instrument, including:

- choosing the response mode;

- drafting the survey items;

- pretesting and revising the survey instrument. (Schonlau, Fricker, & Elliott,

    2002)

The second step in the effort to ensure validity centered on multiple iterations of

the gathering of expert input and consultation during the design phase. This entailed a

four-part process that included (a) completion by the author of literature review, training,

and practice in the area of survey design, (b) ongoing consultation with expert advisors during the survey design process, (c) feedback and input gathering via a two-round digitally-mediated modified nominal group technique (Delbecq & VandeVen, 1971), and (d) a limited pilot test with participants who were conversant in the research topic as well as in the design and conduct of survey research, but who would not be members of the research population.

Asynchronous online nominal group technique.

In its original form, nominal group technique is a structured small-group discussion conducted in order to efficiently reach a consensus. Individuals are asked to respond to questions posed by a moderator. The ideas or suggestions of all group members are then prioritized by the participants (Department of Health and Human Services, 2006). A modified technique that may be referred to as asynchronous online nominal group technique was used in the development of the survey instrument for this research project. This technique stands in contrast to older forms of online nominal group technique in which participants generally communicate in real time via the affordances of networked computer technology as in Dennis and Williams (2003), Stasser and Birchmeier (2003), and Tseng, Diez, and Yang (2006).

Advances in computer technology have long allowed for technology-supported adaptations of nominal group technique based on the use of group support systems (GSS), or group communication support systems, which allow group members to communicate by exchanging typed messages instead of or in addition to speaking verbally. These systems were originally room-based, but the rise of the Internet and Net-enabled organization now enables groups to form and operate without ever experiencing face-to-

face communication. Using these tools, discussants communicate via computer networks, often with relative anonymity. Logistical barriers to communication (e.g., competing for floor time) are eliminated, and an external record of all conversations can be kept (Dennis & Williams, 2003; Stasser & Birchmeier, 2003).

Technological interventions of this type have been demonstrated to improve group decision making (Stasser & Birchmeier, 2003). Group environments created by GSS appear to be fundamentally different from those of traditional verbally interacting groups. For example, GSS groups produce more ideas when participants are critical of the ideas generated by other members (Dennis & Williams, 2003). Dennis and Williams (2003) speculate that, because the GSS provides anonymity, ideas are separated from their contributor which results in criticism being more easily recognized as criticism of ideas rather than people. Participants are shielded from the faults of an idea as well as the negativity associated with criticism and are therefore more likely to share both ideas and criticisms. Asynchronous online nominal group (AONG) technique was deployed in this study in the hope of achieving and amplifying some of the positive benefits of the GSS approach. This AONG process drew on the positive features of older GSS methods, while moving beyond the original models by taking advantage of the interactive capabilities of Web 2.0 and one of the most popular social media tools – the wiki. A wiki is a website that allows any number of interlinked web pages to be created and edited via a web browser using a simplified markup language or a WYSIWYG text editor (Wiki, n.d.).

After receipt of a formal notice of exemption from full board review and final approval from the office of the North Dakota State University Institutional Review Board (see Appendix A), I initiated the AONG process by establishing a wiki at the

Wikispaces.com site and sending an email invitation to fifteen potential AONG participants selected for their reputations of expertise in the fields of education, educational technology, and social media study and/or application. (see Acknowledgments). A positive response was received from nine of the invitees; these participants became members of the AONG, and a page was created for each assigned within the AONG wiki. An initial draft of the survey instrument had already been developed and refined with the help of expert consultation. A reference copy of this first draft was posted on the home page of the AONG wiki, and a working copy of the draft was posted on each participant's personal page. Participants were then notified of the opening of the first 10-day group input round. Participants visited the wiki at their own convenience and added comments and modifications to their copy of the survey instrument. Brackets, highlighting, and colored text were all used to distinguish proposed changes and participant comments from the original material.

At the close of the initial round, results were observed and recorded. Three of the participants had not visited the wiki at all. Six other participants had made or suggested a range of changes to the document, as well as providing comments and feedback on various aspects of the work. The recommended changes and other suggestions were analyzed, and applied as appropriate to produce a second draft of the survey instrument. Copies of the second draft were then placed on the wiki home page and the participant pages, above and separated from the first draft which remained visible to participants. The second 10-day input round was then launched, and four of the six initial participants made further changes or suggestions. At the end of this period, a closing thank you message was sent to all participants, and second-round input was incorporated into the

draft survey instrument.

Survey pilot testing.

The next step in the survey development and validation process was carried out with the assistance of NDSU Group Decision Center personnel. The format of the draft survey instrument was modified and refined for effective online presentation, and the survey was mounted on the Internet for a limited pilot release via the instance of Opinio survey software administered by the Group Decision Center. Pilot testing is a standard and necessary practice in the development of survey data collection instruments. It allows the researcher opportunities to receive general feedback on the instrument, get an idea about likely response patterns, identify needed changes, check for clarity of wording in the instructions and the questions, and get an estimate of survey completion time (Leedy & Ormrod, 2001; McMillan & Schumacher, 2006).

A list of potential pilot group members was developed, and the individuals were contacted by email with a request for participation in the survey pilot testing. The final pilot test group consisted of thirteen North Dakota State University faculty members who were interested in and experienced with the use of social network sites and social media in the delivery of online or hybrid courses. Several were members of on-campus technology interest and study groups. Emails with an invitation to participate and links to the survey were sent to all members of the pilot group. Four members of the pilot group responded by completing the survey and offering extensive useful feedback. This feedback was incorporated into the survey design to create the final draft of the survey

Data Collection

The data collection process proceeded upon completion of the survey final draft.

The survey was administered online by the NDSU Group Decision Center using Opinio survey software on a secure file server. The instrument was open to the public from Sunday, August 8, 2010 to Tuesday, November 30, 2010. When the survey was opened, a call for respondents letter (see Appendix B) that included links to the survey was posted in public discussion spaces on social network sites that host memberships consisting of professionals in the fields of education and training and other interested parties including technology and software developers and vendors, and publishing industry representatives (see Table 4).

I also posted the same letter in my personal page and blog space on several of the same sites. The social network sites were selected for their strategic value as communication nexuses and content distribution hubs frequented by thousands of individuals with some degree of interest in the use of Internet and social media technologies in some aspect of education and training delivery and related activities. In addition, personal requests for participation and forwarding of the call for respondents were emailed to twelve of the leading scholars in the areas of social media research and social media use in education. As these scholars were active in blogging and many online discussion groups, it was hoped that they might initiate a snowball effect (Cresswell, 2005) that would add to the sample size.

The potential for duplicate responses was controlled by an IP address identification and blocking protocol component of the Opinio survey software. However, perfect control over the authoring of multiple responses by the same respondent was not possible. Analysis of text-based responses revealed only one case where there were indications that the responses were produced by the same individual. Responses to the

survey were completely anonymous, all of the information entered online and recorded in the survey reports was de-identified, and none of the data presented in this report would make it possible to identify a particular respondent.

Table 4

Survey Deployment Web Sites

Site	Membership	URL
Classroom 2.0	~50,478	http://www.classroom20.com
EFL Classroom 2.0	~18,149	http://eflclassroom.ning.com
English Companion	~23,320	http://englishcompanion.ning.com
Learn Central	~63,686	http://www.learncentral.org/
Ning in Education	~9,869	http://education.ning.com
The Educator's PLN	~6,230	http://edupln.ning.com/
The Future of Education	~5,292	http://www.futureofeducation.com/

Data Analysis

Analysis of the survey data was initiated by ordering and assembling it in an effort to produce the type of clean and well-organized database that would be usable in the production of reliable and valid information (Fink, 2003a). This entailed transferring to a Microsoft Word document each survey item and all necessary response information from the PDF-format report document produced by the Opinio survey software. As content was processed, brief written summaries of results along with initial analytic memos were produced for all items. The outcome of this first analytic step was the production of an annotated copy of the original set of survey items and their associated response data. This package constituted a draft codebook containing all of the survey data.

Analysis of Quantitative Data

Quantitative survey data was analyzed by various statistical means. The on-board statistics package associated with the Opinio survey software automatically generated measures of central tendency (mean, median, and mode), and measures of dispersion

(range, variance, and standard deviation) for each scaled item. During the initial data cleaning and organization process, these results were examined and compared, extracted from the survey report, processed as necessary to maximize their usefulness, and annotated as needed.

As part of following iterative analytic cycles applied to the whole data base, the quantitative data was revisited and further analysis was carried out by hand and with Microsoft Excel. Excel was also used to produce graphic presentations of quantitative data as needed, and these graphics were inserted into annotated data set as appropriate to illumination of the findings.

Finally, the tag cloud creation and text analysis software Wordle was used to create weighted lists from some of the open-ended text responses. The word cloud graphics themselves are essentially a hybrid of quantitative and qualitative data. In this case, the output material was analyzed as qualitative data. However, they are produced through statistical analysis, so for convenience sake the word cloud method is listed here.

Analysis of Qualitative Data

Qualitative content analysis comprised the basic analytic framework deployed in the analysis of data produced by open-ended survey items. Content analysis (CA) is the use of a set of procedures in the analysis of text in an effort to make valid inferences about the message, the sender(s) of the message, or the audience of the message (Weber, 1990). It generally involves the statistical analysis of samples of written text, or transcripts of spoken discourse via the application of content analysis software. Content analysis can be used for many purposes including the coding of responses to open-ended survey questions (Fink, 2003a, 2003b; Neuendorf, 2002; Weber, 1990). "Content analysis

as a research method is consistent with the goals and standards of survey research"

(Neuendorf, 2002, p. 49).

Quantitative CA may be defined as the systematic, objective, quantitative analysis

of message characteristics (Neuendorf, 2002). In contrast, qualitative CA, or interpretive

analysis, focuses on the evaluation and interpretation of qualitative information, leading

to the formation of theory from the observation of messages and the coding of those

messages (Fink, 2003a, 2003b; Neuendorf, 2002). Interpretive CA "involves theoretical

sampling; analytical categories; cumulative, comparative analysis; and the formation of

types or conceptual categories" (Neuendorf, 2002, p. 6). It is wholly qualitative in nature,

with the analyst being in a constant state of discovery and revision (Neuendorf, 2002). In

these features, Interpretive CA can be recognized as corresponding closely with the

precepts of qualitative data analysis and qualitative research in general as they are

commonly outlined in the literature (Bryant & Charmaz, 2007; Charmaz, 2006; Corbin &

Strauss, 2008; Cresswell, 2005, 2007; Denzin & Lincoln, 2008; Gay, Mills, & Airasian,

2006; Glaser, 1978; Glaser & Strauss, 1967; Strauss & Corbin, 1990; Strauss & Corbin,

1997).

Fink (2003a, 2003b) outlined a clear process for applying Interpretive CA

techniques to qualitative survey data. Since a qualitative survey often results in a massive

amount of information that must be summarized, analyzed, and interpreted, it is essential

to assemble the data into a clean and well-organized database (Fink, 2003a). Fink (2003b)

proposed the following five steps for the content analysis of qualitative survey data, and

these steps were adapted for use in the present study:

1. Assemble the data from all sources.

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2. Learn the contents of the data.

3. Create a codebook.

4. Enter and clean the data.

5. Do the analysis. (p. 102)

Neural network analytic frameworks.

The qualitative data analysis began during the data cleaning and assembly

processes, with associated processes of annotation, memoing, and graphic analysis

initiated. The next step in the process was the conversion of text responses generated by

open-ended survey items into a clean, organized, and usable qualitative data base. To

achieve this, each open-ended survey item (items #12, 15, 17, 19, 21, 26, 27, and 28; see

Appendix C) and all associated responses were entered into an individual neural network

analytic framework, or NNAF (see Appendix D). The NNAF is a graphic qualitative

content analysis coding framework design inspired by the artificial neural network

concept and original to this research project. These frameworks are digital graphic

communication architectures constructed with the flow-chart template and building

function included in the Smart Draw visual processing software package. For the

purposes of this study, use of the NNAF allowed data to be represented graphically on a

computer monitor in a manner conducive to the effective application of inductive analytic

techniques and the extraction of thematic and other information from the data.

In its most common definition, an artificial neural network is an adaptive

computational model that changes its structure based on external or internal information

that flows through the network during the learning phase (Artificial Neural Network,

n.d.). An artificial neural network is an information processing paradigm that is modeled

after biological nervous systems such as the brain, in that an artificial neural network is composed of a number of densely interconnected processing elements that work in unison to solve specific problems (Aleksander & Morton, 1995; Stergiou & Siganos, n.d.). Neural networks are a form of multiprocessor computer system characterized by simple processing elements, high degrees of interconnection between those elements, simple scalar messages, and adaptive interaction between elements; i.e. learning (Smith, 1996).

Examination of the basic NNAF model developed for use in this research project will reveal that it replicates the typical 3-layer pattern found in simple feedforward artificial neural networks. The NNAF mirrors the commonest type of artificial neural network, which consists of three layers of units: a layer of input units that is connected to a layer of hidden units, which is in turn connected to a layer of output units (Aleksander & Morton, 1995; Smith, 1996; Stergiou & Siganos, n.d., Wang, 2009). In an artificial neural network, the activity of the input units represents reaction to features in the raw data that is fed into the network. The hidden units are neither input or output units, and their activity is influenced by the activities of the input units and the weights on the network connections between the input and hidden units. The hidden units in turn influence the activity of output units, again via weighted network connections (Aleksander & Morton, 1995; Smith, 1996; Stergiou & Siganos, n.d).

In the NNAF model developed for use in this study, the response modules represent the input layer, with the output being the component theory cells. The hidden units are comprised of the analytic and consolidative layers and the networked interface between them. Their operations are represented by the work of the researcher as the data analysis process is iteratively carried forward. In the simple three-layer artificial neural

network model, the hidden units are unconstrained in regards to the construction of representations of the input, as well as in their reaction to it (Stergiou & Siganos, n.d). Similarly, data fed through the NNAF influences the actions of the hidden units, causing the framework to develop in a free manner in response to the application of the individual researcher's analytic processes.

Neural networks have the ability to derive meaning from complicated or imprecise data, and can be used to extract and detect complex patterns and trends that would ordinarily be difficult to identify (Stergiou & Siganos, n.d.). The detection of patterns and trends in data is a primary objective in the analysis of qualitative research data. Therefore, a coding framework inspired by the neural network processing model appeared to be suitable for use in the analysis of the sets of text responses generated by the open-ended items in the data collection instrument used in this research project. In this case, the application of neural network analytic frameworks comprised a structured and orderly approach to the conduct of what Fink (2003a) referred to as inductive content analysis: a method for analyzing and interpreting qualitative survey results in which the analyst goes through a database and applies inductive reasoning and experience to a review of the data for unifying ideas and dominant themes.

To this end, the NNAF served primarily as a visual device that made it easier to identify concepts and portray the possible relationships between them. The NNAF helped to open the data set to the process of heuristic coding, the iterative assignment of codes ranging from metaphors expressed in a single word or image to complex narratives about particular issues (Jensen, 2002). In this regard, use of the NNAF closely corresponded with the qualitative analytic practice of diagramming as described by Corbin and Strauss

(2008). The basic NNAF model was used as an initial template which then operated with flexibility in adapting and expanding in response to the particular data set being processed through it.

Steps in NNAF data processing.

Following is a sketch description that summarizes the steps in NNAF processing (refer to Appendix D) as it was carried out in the course of this research project. This is an ideal ordering presented for descriptive purposes only. During live analysis, the processes will respond to the interactions between researcher and data, with the potential for nearly infinite variation in both the vertical development of and movement through the model, and the formation of axial and other linkages. In addition, the analytic process may be both interrupted and influenced by annotation and memoing activities.

Step 1: Loading the raw input into the NNAF. A survey item is placed in the Query Cell for the purposes of convenient reference, and the individual responses to that item are placed in the Response Cells below. The Response Cells represent the input layer of the NNAF. The Opinio survey software generated a numbered list of item responses organized in the order in which the responses were input. Consistency of operation seemed to be the only important factor here, so responses were always input to the response cells by working from left to right, beginning with the number one response.

Step 2: This step corresponds with the open coding process commonly associated with the conduct of grounded theory qualitative research. It involves heuristic coding as per Jensen (2002). During the process of response cell data entry, and after entry is completed, the analyst interacts with the data. Asking questions and making comparisons are the key analytic strategies at play (Corbin & Strauss, 2008). A fluid and generative

process emerges, and leads spontaneously into open coding. During open coding, the analyst generates a representation of the emergent set of categories that will be used to further open the data to conceptualization (Corbin & Strauss, 2008; Glaser, 1978). When using the NNAF, pieces of information representing emergent themes and concepts appear in the Analytic Memo Cells as the first layer of output data. At this stage, initial evidence of developing network connections may be noted, and the possible connections graphically represented by linking cells with connective arrows.

Step 3: Concept inter-linkage and category generation take place in the Analytic Mesh Interface. At this stage, analysis through the NNAF model may produce a mix of higher- and lower-level concepts expressed in both researcher-denoted terms and in-vivo codes. The codes produced in this stage are the products of networked interaction between the units in the Analytic Memo Cells. These codes are placed in the third layer of the NNA model as Concept Input Units. Interconnections between concepts and repeating thematic patterns that appear at this stage will be designated by arrows in the NNA diagram as well as noted in memos.

Step 4: Interaction between Concept Input units, enhanced by the analyst's growing familiarity with and abstraction of the data, begins to push fragments of information across the Solution Synapse. This output is represented as Theory Particles, i.e. small bits of information that represent the consolidation of the products of open coding into the substantive codes that conceptualize the empirical substance of the area of research (Glaser, 1978). Note that steps 3 and 4 are not necessarily cleanly delineated, but may occur simultaneously as interwoven processes.

Step 5: The substantive codes begin to interact and coalesce into theoretical codes.

This stage in the process corresponds to what Corbin and Strauss (2008) have referred to as axial coding. Analysis of this information leads to the production of a layer of Consolidative Memos that place the developing output data within frameworks derived from the researcher's experiences and explorations of the literature. This layer is characterized by consolidation of thematic strands of information, thick description, and consideration of the implications offered by the previous analytic stages. Information is interrelated and combined, with the objective of extracting essential core concepts that may be useful in describing the phenomenon being studied.

Step 6: Core concepts are extracted and summarized as Component Theory units. Within a conceptual framework drawn from Grounded Theory research, these units may be conceived of as substantive theories as per Glaser and Strauss (1967) in that they are potentially applicable to particular practical contexts, while remaining limited in their general explanatory power. In the same vein, if the NNAF is being used in the development of Grounded Theory, the Component Theories may later contribute to the formation of formal theory. In general qualitative analysis, the Component Theory units may serve as descriptors for the primary thematic categories that emerge during coding.

Step 7: In some instances, consideration of an output set of Component Theories may lead the researcher to produce a summarizing umbrella statement or description that effectively provides a direct answer to the initial query. This output would fill the Solution Theory Cell in the NNAF.

These steps comprise a basic description of one approach to application of the NNAF concept to the processing of text data. Note that, in this model, any output cell content represents secondary data that can be fed into another NNAF and processed as

responses to either initial or emergent queries. In theory, linked series of NNAF layers could be produced ad infinitum. In practice, data saturation in response to related research questions can be achieved, and directions for further research can be generated.

The full coding framework used in this project was composed of mirrored visual text analysis structures comprised of graphic representations inspired by the artificial neural network concept. One side of the bilateral framework consisted of a query/input processing unit, while the opposing side represented a reversal of the input operation in the form of an uptake layer feeding into a consolidative process, which in turn led to an output layer that produced discursive and descriptive response to the input data. The over-arching conceptual model for the use of this particular analytic framework posits a theoretically infinite, scaled replication of these bilateral neural processing structures whereby sets of the output theory cells could in turn form layers of input units and undergo further refinement and consolidation in the generation of broad descriptive structures.

In summary, the neural network analytic framework used in this research was a new adaptation and application of general thematic analytic techniques common to qualitative research. Neural Network Coding is an approach to data organization and analysis that integrates open and axial coding, memo writing, and comparative analysis in a new model for the qualitative processing of text data. The NNAF provides a complete analytic framework and methodology that is suitable for dealing with multiple and varying text responses to a single query. The NNAF aids in the conceptualization and management of the coding and analysis processes, and guides the researcher through the identification of emergent themes and description of the phenomena under study.

Summary of Data Analysis Methods

Application of the mixed-methods approach to the data analysis portion of this research produced quantitative data in the form of statistical measures of central tendency, qualitative thematic data, narrative-style material, and in-vivo data. Standard qualitative data manipulation, analysis, and coding techniques were used as per the literature on qualitative research. These methods were augmented by the use of Neural Network Analytic Frameworks, and word cloud generation software. When used to supplement established approaches and principles of qualitative analysis, newer graphically mediated analysis techniques like these can help a researcher obtain varied and fresh views of the data. In this study, a multitude of analytic approaches combined with an iterative process to render description from raw data, and allow the development of viewpoints that led toward answers to the research questions.

CHAPTER 4. RESEARCH FINDINGS

Statement of the Problem

Social network site user numbers are growing rapidly and half of all Americans over 18 years of age now use social networking sites (Madden & Zickuhr, 2011). Among young people, SNS use is considered to be universal (Smith & Caruso, 2010), with user levels at 73% for online Americans ages 12 to 17 (Lenhart, Purcell, Smith, & Zickuhr, 2010), and 83% for Internet users aged 18-29 (Madden, & Zickuhr, 2011). The widespread adoption of these sites by individuals of student-age through early adulthood implies that social network technology does have implications for education and training.

SNS already serve important roles in students' informal education by facilitating social learning functions, engaging users in a range of complex literacy tasks, and providing a venue where students can seek peer support and help with school-related tasks from current and former classmates (Greenhow & Robelia, 2009). Majorities of student users of all ages report that education, and schoolwork specifically, are two of the most common topics of conversation on the social networking scene (Greenhow & Robelia, 2009; Greenhow, Robelia, & Kim, 2008; National School Boards Association, 2007; Smith & Caruso, 2010). However, the use of social network sites as components of education delivery and the pedagogy around that use represent a nearly uncharted research territory (boyd & Ellison, 2007).

Moreover, the intersection between educational realms and online social networks remains surrounded by confusion, fear, and bias (boyd, 2008; Ewbank et al., 2008; Hargadon, 2009; Saunders, 2008). In K-12 settings at least, SNS are commonly blocked by school software. Yet the population of online K-12 students is growing by a five-year

compound annual growth rate of 30.7%, and over 4 million K-12 students participated in some kind of formal virtual learning program in 2010 (Ambient Insight, 2011). Students are interacting with the world-wide web, both through filtered networks at school, and with complete freedom on their ubiquitous mobile devices. According to market projections by Ambient Insight (2011), over 29% of all US school children will be participating in some kind of online instruction by 2015. It appears likely that social network sites, networked online gaming, and similar social media communication tools will be the primary Internet access points and online interfaces used by online youth worldwide, and a constant presence in their lives.

If teachers are to leverage learners' everyday experiences in Web 2.0-enabled contexts in order to increase student engagement in school and learning, researchers need to address the roles teachers and schools can play in modeling and facilitating learning through creative and participatory online practices (Greenhow et al., 2009). There is a need for theoretically driven empirical research that generates data that can be used to answer questions concerning what is actually taking place when social software technologies meet education (Dutton, 2008; Selwyn & Grant, 2009), and what practical pedagogical possibilities are offered by this software.

Purpose of the Study

The purpose of this study was the exploration of instructors' use of social network sites as tools for teaching and learning, the provision of insight into a paradigm shift that is occurring in the realm of digitally-mediated education delivery, and the creation of a conceptual map modeling the use of social network software in support of constructivist learning approaches.

Research Questions

This purpose was accomplished via a mixed-methods (Creswell & Plano-Clark, 2007) study guided by the following research questions:

1. What are educators' perceptions regarding the general utility, benefits, and drawbacks of social network sites as educational tools?

2. What are the views of concerned experts and classroom teachers experienced with the use of social network sites in their practice in regard to the potential of this technology to engender paradigmatic change in educational domains?

3. To what extent do these data enable the development of a model for the use of social network sites in teaching and learning?

Research Results

Data collection in support of the research questions was carried out by means of a cross-sectional web survey (Fink, 2003a; Fraenkl & Wallen, 2006; Schutt, 2004). The survey consisted of an 8-item demographic section followed by a 20-item section focusing on the use of social software in the delivery of education and training (see Appendix C). Note that survey item number 13 constituted a request for respondents to rate the importance of 20 selected features or components of social network software to their educational practice. Including the item 13 sub-items, the total of answerable items was 48. Respondents were presented with a mix of structured- and unstructured response items, with the structured response items based on a variety of nominal and ordinal scales (see Table 3). The survey was designed to collect data suitable to the application of both quantitative and qualitative analytic techniques. At the close of the participation window (August 8 to November 30, 2010) 72 people had clicked into the online survey,

generating a varying number of responses (maximum: 44, minimum: 17) to each of the 28 survey items (see Figure 1). As tracked by the Opinion software, 24 respondents completed all survey items in one session.
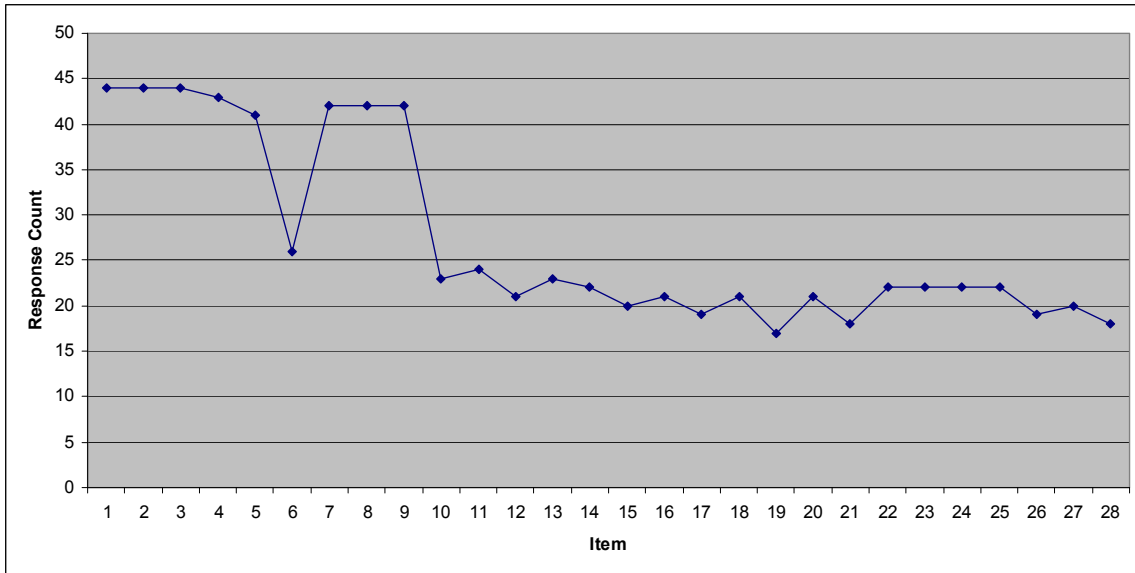
Figure 1. Item Response Counts

Survey respondents included residents of eleven countries: Australia (2), Canada (2), Malaysia (1), New Zealand (1), Philippines (1), Puerto Rico (1), South Korea (2), Spain (1), Turkey (1), the United Kingdom (2), and the United States (30). The majority of respondents (30/44) to the survey item regarding country of current residence were recorded as living in the United States. Of respondents who provided their age (n=44), twenty were between 51 - 60 years old; twelve were between 41 - 50 years old; eight were between 31 - 40 years old; and four were between 21 - 30 years old.

Most respondents (40/44) reported working in the PreK-12 or Higher Education fields, with one respondent reporting working in the field of occupational training, and three responding as 'other'. Item 4 asked for a detailed breakdown of occupational settings within the educational fields, and revealed only one respondent (/n=43) working

in a pre-K setting; three more worked in kindergarten settings. Nine worked in elementary school contexts (grades 1-5); 15 respondents worked in grades 6-8; 14 in 9-12. These numbers nearly matched the counts of respondents working in Baccalaureate and Graduate education: 14 and 15 respectively. Five respondents reported being engaged at the Doctoral level of education.

In terms of particular educational specialties (Item 5, n=41), the counts were as follows: thirteen (31%) respondents identified themselves as working in the Arts and Humanities; six worked in mathematics; three in social sciences; two in computer science; and two in career and technical education. Three respondents chose not applicable. Twenty-nine percent of respondents (12/41) chose other, with occupational fields listed as follows: All (generalist); Administration; Education; Library; Library Media; Medicine; Military; Nursing; PE/Health/Technology; and Teacher Professional Development. The medical, military, and nursing occupational fields drew one respondent each. Regarding specific roles within their occupational field (Item 7, n=42), 34 respondents (81%) reported working as an instructor, followed by administrator (9), researcher (8), and other (6). Other reported work roles included editor, e-learning developer, trainer/consultant, and technologist. For this question, the total number of choices (57) was greater than the number of responses to the item, indicating that several respondents worked in more than one role.

The survey instrument included two questions about participants' general use of educational technology. One item (Item 8, n=42) asked respondents to indicate the instructional formats in which they used technology for course delivery. Choices included fully online education, hybrid or blended learning, face-to-face instruction, and other.

Respondents could select more than one choice, and the total number of choices (63) was greater than the number of responses (42) to the item. Results indicated that technology was most often used in face-to-face contexts, with 44% of respondents reporting technology use as part of face-to-face instruction. Thirty-four percent used technology in hybrid or blended learning settings, while 17% used it in the delivery of fully online instruction.

The next item (Item 9: "How long have you been using Educational Social Software (ESS) in your instructional activities?") changed the focus of data gathering from the collection of general information to data gathering on the topic of ESS in specific. For the purposes of this research project, ESS was defined as demonstrated below in a prefatory note following the welcome paragraph on the landing page of the data collection instrument:

> Note 1: For the purpose of this study, I will draw on the work of Anderson (2006), boyd (2007), boyd and Ellison (2007), Dalsgaard & Paulsen (2009), and Garrison & Anderson (2003), to define educational social software (ESS) as: technology that affords the establishment of individual virtual personal spaces, or profile pages, by users, while at the same time providing access to personal and shared suites of typical social media tools.

Most respondents (22/n=42) to Item 9 reported using ESS in their instructional activities for more than 3 years. Ten had been using ESS for less than one year, and ten more had been users for 1-3 years.

Item number 10 (n=23) followed up on the respondents' use of social software technology by gathering information on the foundational educational social software

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tools used by respondents as part of their professional practice. Respondents were requested to identify these tools in an open-ended text response. Twenty-three responses yielded 92 specific identifications. During the data cleaning process, references to standard learning management software (e.g. Blackboard, Moodle, & WebCT) were removed, as well as overly-general identifications such as email, Google, and Yahoo. The data was further refined by combining all repetitious listings, and categorizing listings that referred to the same type of tool by different product names (i.e. Word Press, Blogmeister, and Blogger = "Web logs"). These processes left a list of 28 individual tools that could be described as falling within the broad definitions of educational social software as proposed by Anderson (2005a) and Lambropoulos and Romero (2010). (see Table 5)

Ning and Facebook, the tools that received the highest number of repeated mentions, fit within the category of "true" social network sites; as per boyd and Ellison(2007) those that afford the establishment of social presence within a bounded group and the ability to maintain and display a list of contacts (see Table 6). These sites also support some of the most extensive user modification and content generation capabilities. Ning and Facebook were followed in frequency of identification by blogs and wikis. While the latter two technologies may not fall within the pure definition of social network sites, they are listed here because they do allow for maintenance of ongoing, asynchronous social presence in a virtual space, production of extensive and intensive personal expression, generation and customization of content, and display of lists of users and other contacts.

Purposes for Using ESS in Educational Contexts

In response to Item 11 ("Identify your general purpose for using ESS in the

Table 5

Frequency Counts for Identified Tools

Tool	Times Identified	Tool	Times Identified
Ning	14	Edline	1
Facebook	10	Edu20.org	1
Blogs	9	eFront	1
Wikis	7	ePals	1
Twitter	3	Gmail chat	1
Edmodo	2	Google Apps	1
ELGG	2	LinkedIn	1
Elluminate	2	MySpace	1
Youtube	2	Netvibes	1
Basecamp	1	Scratch	1
Breadnet	1	Superclubs Plus	1
Custom software	1	Voicethread	1
Diigo	1	Yahoo chat	1
Drupal	1	Wimba	1

delivery of education and training."), participants' offered a variety of reasons for using

ESS in the delivery of education and training. To identify their general purpose for ESS

use, respondents were asked to choose between three alternatives: use of ESS primarily

for communication and community-building, primarily for content delivery and

assignment completion, or primarily for both. Participants favored the capacities of ESS

to support communication and community-building over the ability to deliver content and

assignments, with 29% identifying the former as their general purpose for using ESS, and

only 8% citing the latter. A strong majority (62%) identified the two capabilities as being

of equal importance.

More detailed data regarding respondents' specific purpose(s) for using ESS in

the delivery of education and training came from the open-ended question presented in

Item 12: "In your own words, identify your specific purpose(s) for using ESS in the delivery of education and training." Although there was variability in the responses to

Table 6

Frequency of Social Network Site Identification

Site	Times Identified
Ning	14
Facebook	10
blogs	9
Wikis	7
Edmodo	2
MySpace	1

this item, processing the 22 open-ended text responses through the NNAF produced a thematic analysis that made several commonalities apparent. The facilitation of contact, communication, collaboration, and community appeared as the primary theme in the data. Respondents also highlighted the ability of ESS to meet instructors' needs for practical and efficient content delivery mechanisms, and provide flexible tool sets to use in support of everyday teaching and learning interactions. One respondent mentioned the use of ESS in a teacher training program for the purpose of helping preservice teachers "understand how technology has changed the social practices and thus the literacy of contemporary society", and stated that "Ultimately I use these tool [sic] to expand preservice teachers' definition of what it means to [sic] literate in the digital age in hopes that they integrate technology meaningfully into their future teaching practices."

One respondent to Item 12 alluded to issues of safety and security. That response mentioned that ESS could be used to "Provide a safe, collaborative platform for students to share ideas and concepts as well as communicate with each other." Another respondent stated that a purpose for using ESS was to "Democratize what passes as best practices and educational truths by publicly interrogating those who would control and centralize

curriculum and standards."

Comparative Importance of Various ESS Features

Survey item 13 provided a list of common ESS features and asked respondents to use a 1-5 point Likert scale to rate the importance (1= not important; 5 = very important) of each feature to education and/or training delivery activities (see Table 7). Privacy controls were rated as being the most important feature, with an average rating of 4.65/5. Isolation of ESS network information from the Internet as a whole has also been identified as desirable by participants in other research projects. For example, the results of a 2010 study of 32,278 U. S. undergraduate students by the EDUCAUSE Center for Applied Research included a finding that over 93% of the students applied some privacy restrictions on the profiles they published on social network websites (Smith & Caruso, 2010). Following privacy controls in importance were connection to networks of peers (4.57/5), connection to networks of experts (4.39/5), link sharing (4.35/5), and personal learning environments/spaces (4.25/5).

Among the text input responses to the "Other" option on this survey item, there were two comments referring to the importance of building a customizable set of features into an ESS instance. "Because I teach people who can be novices with technology, it is crucial that I can start with a very simple course portal in which the full array of features that can be confusing can be turned off in the settings." This respondent found it useful to be able to offer simplified tool arrays as an initial introduction to the software when training students in the use of ESS tools. As novice users become comfortable in the online learning environment, and gain familiarity with the limited tool set, more options would then be "switched on", expanding the capability of the ESS as the competence of

the users grows:

> Gradually, I can then move from a closed course management system to using
>
> more open personal learning networks. In my context effective learning through
>
> ESS requires a gradual unfolding of features, and therefore that they can be turned
>
> off and on easily by the instructor.

Table 7

Perceived Importance of Various ESS Features to Education and/or Training Delivery

Feature	Rating (1-5)
Privacy controls	4.65
Connection to networks of peers	4.57
Connection to networks of experts	4.39
Link sharing	4.35
Personal learning environments/spaces	4.26
Blogs	4.22
Audio/video play capability	4.22
Commenting	4.13
Audio/video upload capability	4
Other	4
External feeds/RSS capability	3.96
Public profile spaces	3.87
Discussion boards	3.87
Synchronous audio/video conferencing	3.78
Microblogs/updates	3.74
Photo storage and display	3.52
Synchronous chat	3.35
Customizable graphics/colors	3.35
Shared calendars/scheduling	2.96
Trackbacks	2.61

Note. 1 = Not Important; 5 = Very Important

Another respondent commented on a different aspect of both CMS and ESS systems: the

design of features for efficiency of use by course administrators. This text response noted

the importance of having "Grade books that gather discussion and wiki entries in one

place for grading efficiently."

The list of ESS features offered for rating in Item 13 was the aspect of the

research instrument that underwent the most extensive change during the asynchronous online nominal group phase of survey development (see Table 8). There is a wide variety of software that is commonly referred to as social software (boyd, 2008; Dron, 2006; Greenhow et al., 2009; McLoughlin & Lee, 2007; Shirky, 2003). This includes many types of online publishing and communication tools that would be appropriate for inclusion in an ESS instance. Several additions were suggested by the AONG members, and some of these suggestions were accepted.

Table 8

Initial and Final Lists of ESS Features Proposed for Inclusion in Survey Item 13

Initial List	Final List
Personal spaces/pages	Personal learning environments/spaces
Discussion boards	Public profile spaces
Weblogs (blogs)	Privacy controls
Synchronous chat	Connection to networks of peers
Audio/video playback capability	Connection to networks of experts
Audi/video upload capability	Discussion boards
Synchronous audio and video conferencing	Commenting
Photo storage and display	Weblogs
Customizable graphics/colors	Microblogs/updates
	Link sharing
	Synchronous chat
	Audio/video play capability
	Audio/video upload capability
	Synchronous audio/video conferencing
	Photo storage and display
	Customizable graphics/colors
	External feeds/RSS capability
	Shared calendars/scheduling
	Trackbacks
	Other

ESS Support for the Development of Learning Communities

A key aspect of this research project was the exploration of educators' views regarding the practical capabilities of ESS to enable the development and support of learning communities. Survey item 14 asked respondents to rate the importance of these

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capabilities. All responsdents (n=22) rated as important "ESS capabilities to enable the development and support of learning communities". Fifty-five percent of the respondents rated this aspect at 5 (very important), while another 36% rated it at 4, with an average rating of 4.45/5 (See Figure 2).
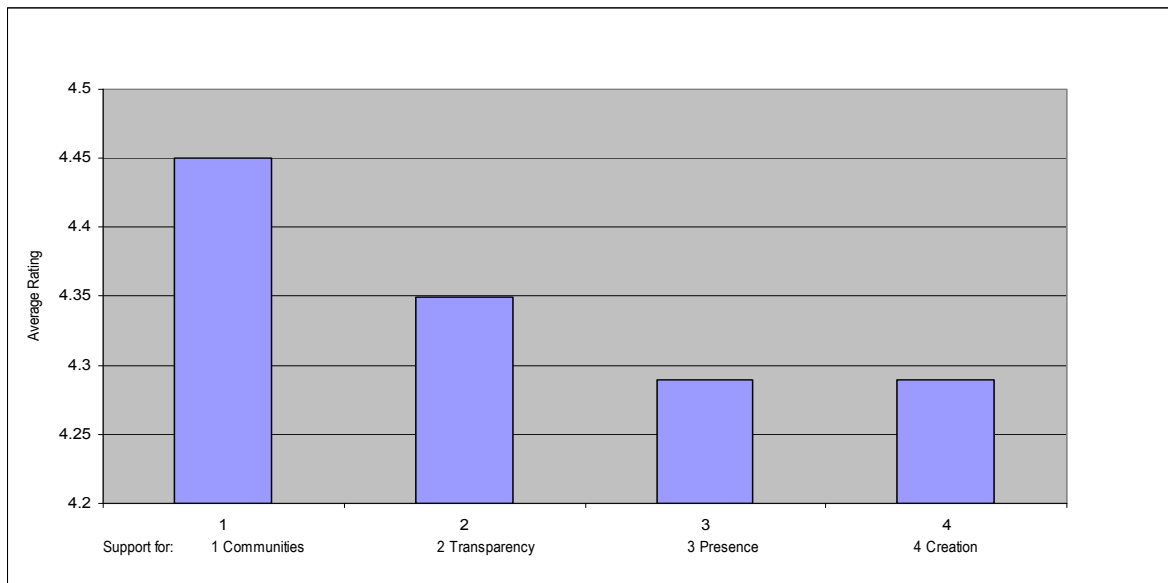
Figure 2. Perceived Importance of Specific ESS Capabilities

The ESS feature best enabling the development and support of learning communities (Item 15, n=20) was thematically identified in open-ended responses as a general capability for information sharing. Information sharing could be accepted as a logical synonym for interaction as discussed above, and as an element in the establishment of personal presence in the online environment (Garrison & Anderson, 2003; Gunawardena & McIsaacs, 2004; Short et al., 1976). A clear preference for "traditional" text-based Internet personal publishing affordances was visible among respondents. Out of 22 mentions of discrete social media tools, 12 mentions of blogs, discussion boards, and commenting appeared. There was also one mention each of e-mail and "an online authoring tool of some kind".

ESS Support for the Establishment of Social Presence

In response to survey item 16 (n=21), participants rated the importance to their instructional practice of ESS capabilities to enable the development and support of social presence in online environments. The item was accompanied by a general definition of social presence as follows: "Social presence = the ability of participants to project themselves socially and emotionally through the medium of communication being used." As with the question concerning ESS support for learning communities, all responses were unanimous in indicating that ESS capabilities to enable the development and support of social presence in online environments were important to some degree. Forty-three percent of respondents rated the importance of this aspect of ESS at 5, while another 43% rated it at 4, with the remaining respondents scoring this feature at three. The average rating was 4.29/5 (See Figure 2).

Concerning the ESS feature(s) that best enable the development and support of social presence in online environments (Item 17, n=19), there was further development and coalescence of themes that first appeared in the open-ended responses offered in regards to Item 15 concerning the development and support of learning communities. The tool of primary necessity was seen as support for communication and information sharing. Responses included "threaded asynchronous discussion forums are the most powerful for creating social presence IF the instructor knows how to use them for that purpose" and "Threaded asynchronous forums, with excellent moderation". In contrast, another individual opined that "Fully asynchronous learning environments can create a feeling of isolation."

The text response data content of 189 words produced six positive mentions for

profile pages or SNS, while photo and multimedia support received five. The more familiar discussion boards and blogs were put forward three and two times respectively.The responses reflected general support for the use of the personal profile as a tool for establishing social presence. One respondent noted that "Profiles are critical for initial contact. After profile exploration has resulted in a connection, other tools (blogs, microblogging, link sharing, photos) become vital."

The use of profile pages was one component within a broader category that emerged as the use of non-text forms of communicative and information-sharing media in general. For example, link sharing, photos, graphics, videos, live chat, and video conferencing were all supported as being important to the development and support of social presence in online environments. There were two specific mentions of personalization or customization of content as being beneficial to the establishment of presence. In summary, the data made it clear that variety, range, and flexibility in expressive and communicative capabilities, going well beyond the typical selection of text-based forms of personal publishing, were important to the development and support of online social presence.

ESS Support for the Creation of Transparency

One pedagogical potential of social network sites lies in supporting transparency through a combination of personalization, socialization and the sharing of information and tools within social networks (Dalsgaard 2006). This is idea was addressed in survey item 18 by gathering respondents' (n=20) ratings of the importance (1 = not important, 5 = very important) to their instructional practice of ESS capabilities to enable the development and support of transparent learning environments in which students have

awareness of and access to the products generated by other students in the process of engaging with course materials and activities. A majority of survey respondents agreed that this feature of ESS was important to instructional practices. Fifty-five percent of respondents rated this aspect at five, while another 30% rated it at four. The average rating for this capability was 4.35/5. (See Figure 2)

An open-ended follow-up item (Item 19, n=17) called for short answers to the question of which ESS features best enable the development and support of transparent learning environments. In continuation of a theme noticeable throughout the data, text-based personal publishing tools remained dominant: the focus of responses was on personal publishing, with an emphasis on document sharing as evidenced by repeated mentions of Wikis, and one mention of Google Docs in specific. Reference to blogs and comments also appeared often in the data. User skill and comfort levels appeared to have an influence on the tools preferred by instructors:

> The biggest barrier in my 9 years in teaching of teachers online is that the technology is too intimidating for students to navigate complicated environments. Therefore I make (sic) end up using the simplest tools to do complicated things, for example, use attachments in asynchronous threaded forums for sharing and collaboration of projects.

One respondent noted that

> Features are somewhat secondary to modeling of the instructor. I've seen Moodle courses that encourage transparent learning...and I've seen open courses that don't. The real concern is how the faculty member assists learners in beginning to participate in open spaces.

This observation serves to highlight the fact that transparency is primarily supported and accomplished by the instructional orientation towards using the tools made available for the course, rather than by the tools themselves. Considerations beyond the availability and use of particular tools have a bearing on the production and maintenance of transparency in online learning environments.

ESS Support for Distributed Content Creation

The use of social media technologies in the context of education and training delivery has the potential to neutralize traditional hierarchical and sole-source models of content management and enable all course participants to participate equally in both content creation and distribution (Saljo, 2010; Siemens, 2006b). This aspect of ESS was explored in survey items 20 and 21. For Item 20, research participants were asked to rate the importance (1 = not important to 5 = very important) to their instructional practice of ESS capabilities to support content creation by all users/course participants. All respondents (n=21) rated the importance of support for distributed content creation at a three or above. Forty-three percent rated this aspect of ESS at 5, while another 43% rated it at 4. The average rating was 4.29/5. (See Figure 2)

This query was followed by an open-ended question asking respondents to identify the ESS features that best support egalitarian models of distributed content creation (Item 21). Most of the choices made were repetitions, as items from the basic suite of self-publishing tools were once again in the majority. "All text and multimedia communication tools." was one response that fairly summarized the general theme for this item. Two responses alluded to the fact that content can be created with tools external to the ESS, such as Microsoft Word, PowerPoint or various audio and video capture tools,

and then uploaded to the ESS environment. Consideration of the apparent data saturation represented by the repetitive mention of general information sharing and publishing tools in many of the responses led to an understanding of the simple 4-word response: "shared common learning space" as the most enlightening response to Item 21. The data indicated that no one particular feature offered as part of an instance of ESS was viewed as most effectively supporting content creation by all participants; the tool or tool set chosen for such production will vary according to specific context and need. Instead, the ESS itself was seen holistically as constituting a space where content could be generated and knowledge created in a variety of guises and distribution patterns and by multiple means.

Instructors' General Viewpoints Regarding ESS

The last section of the survey was oriented toward gathering information about individual and institutional effects on the adoption and use of social network software in education and training contexts. Survey items 22, 23, 24, 25 (See Appendix C) were intended to gather data on research participants' general viewpoint in regards to educational social software. Each of these items offered a descriptive statement concerning ESS and asked respondents to indicate agreement with the statement via a five-point scale: 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), 5 (strongly agree).

Item 22: "Educational social software is a viable tool for teaching and learning." All respondents agreed with this statement, with nearly 73% (n=22) choosing strongly agree. This is an expected finding given that the study was implemented online and the sample was primarily gathered through the medium of social network sites catering to educators, educational technologists, and other interested parties. The finding does

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contradict that portion of popular opinion that as per (boyd, 2008) seems to consist of a view that SNS usage in general is a time-waster for older students, and inappropriate and even harmful for young students.

Item 23: "Educational social software is a tool that can lead to the development of new models of education and training that are centered on students as the creators of individual life-long learning processes rather than on institutions and teachers as controllers of educational processes and dispensers of knowledge." This rather detailed query was intended to plumb concepts associated with the potential for ESS to engender paradigmatic change in educational domains, as per the research question regarding the same. The item constituted a statement about the potential for ESS technology tools to change both educational processes and the conceptual models that are used to define teaching and learning. Over 86% (n = 22) of respondents agreed or strongly agreed that ESS could be a driver of such paradigmatic change.

Item 24: "ESS use is a fad that will have no lasting impact on educational practices." This question was primarily intended as a test question (Fink, 2003 a; 2003b) that would give some insight on whether or not items were being answered conscientiously as respondents neared the end of a lengthy questionnaire. The statistics on SNS adaptation and use in genral indicate not a fad but a transformative socio-cultural force that has already had lasting impact on educational practices if for no other reason than the fact that teachers and professors now have to deal with the use of the sites by students during class time (Selwyn, 2006, 2007). Such a view was supported in this research project by the 86% (n=22) of respondents who disagreed or strongly disagreed with the proposition that SNS use was a fad.

Item 25: "ESS use takes up time that could be better spent on other learning activities." There is adequate support for the assumption that a large number of people consider the use of SNS valuable for some range of purposes, and such use is apparently a comparatively valuable use of time in relation to other activities in general. Participants in this research project recognized this value as over 81% of respondents to Item 25 (n=22) disagreed with the proposition that ESS use is not a comparatively valuable use of class time in relation to other activities.

Identifying Challenges and Barriers to the Implementation of ESS

The final three survey items used in this research project were designed to gather interview-like data in which some of the authentic tone and detail of research participants' thoughts and voices would be registered. The design was successful, and the data gathered by these items was the most voluminous and descriptive response material generated by the survey. To answer items 26 and 27, respondents produced open-ended reflective comments on the topic at hand: the difficulties associated with implementing the use of ESS in their individual occupational settings, and which of those difficulties arose from the institution itself. These two items used text to implement a standard qualitative interviewing technique: asking about a topic in general scope, then following up with a more specific inquiry about the same topic. This approach is a way to assist participants in considering a topic from a variety of perspectives, and has the potential to expand the volume and detail of the information gathered (Rubin & Rubin, 2005).

At Item 26 (n=20), rarticipants were asked to identify general challenges associated with implementing ESS capacities within their occupational setting. In the following item (27, n=20), respondents were requested to identify specific institutional

barriers to SNS implementation in educational contexts. The disparate voices and life experiences of these 20 respondents from around the world showed a high degree of commonality in producing several clear and identifiable themes. (see Figures 3 & 4) In terms of general challenges teachers face in implementing the use of ESS in their occupational settings, concerns seemed to focus around relatively few factors: the students, ESS, teachers, and contexts for usage (any environmental factor not associated with an institution i.e. "In 3rd world countries like the Philippines, owning a computer or laptop is still a privilege."). Student issues and difficulties with ESS itself were primary challenge factors (See Figure 3).

The scenario around institutional barriers to the implementation of ESS was more complex. Respondents identified 9 factors at work, with faculty (skill deficiency and attitude) being the primary issue (See Figure 4). The responses to item 27 presented some conceptual difficulties during analysis. For example, when considering institutional barriers it must be recognized that, in most institutional settings, administration at all levels can have a strong and varied influence on the establishment, maintenance, or removal of barriers. Ultimately, administrators are theoretically responsible for the overall success or failure, problems or smooth going of a program or institution. In many cases, the administration itself may constitute a barrier; for instance, as some respondents reported, when there is a "lack of vision by administrators" reflected in a "difficulty in individuals letting go of control assumed to exist in centralized education model" that is expressed in an "attitude/perception which influences policy and decision making". Therefore, when coding this data thematically, it was necessary to resist the temptation to treat administration as an overarching descriptive category that could subsume all related

issues such as money, censorship, safety, technology, and faculty. This realization lead to
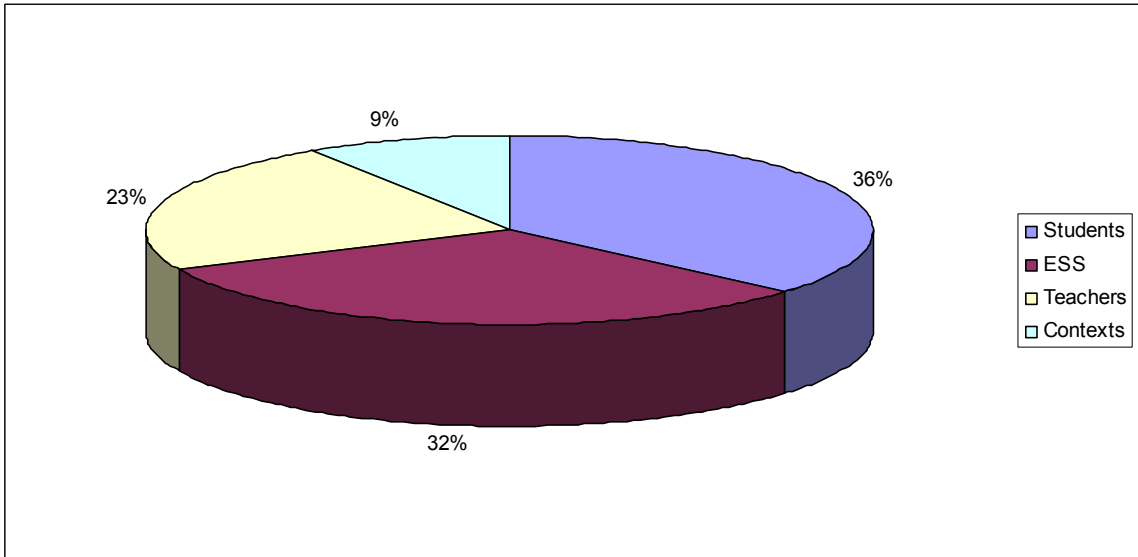
Figure 3. Primary Themes: General Challenges to ESS Adoption
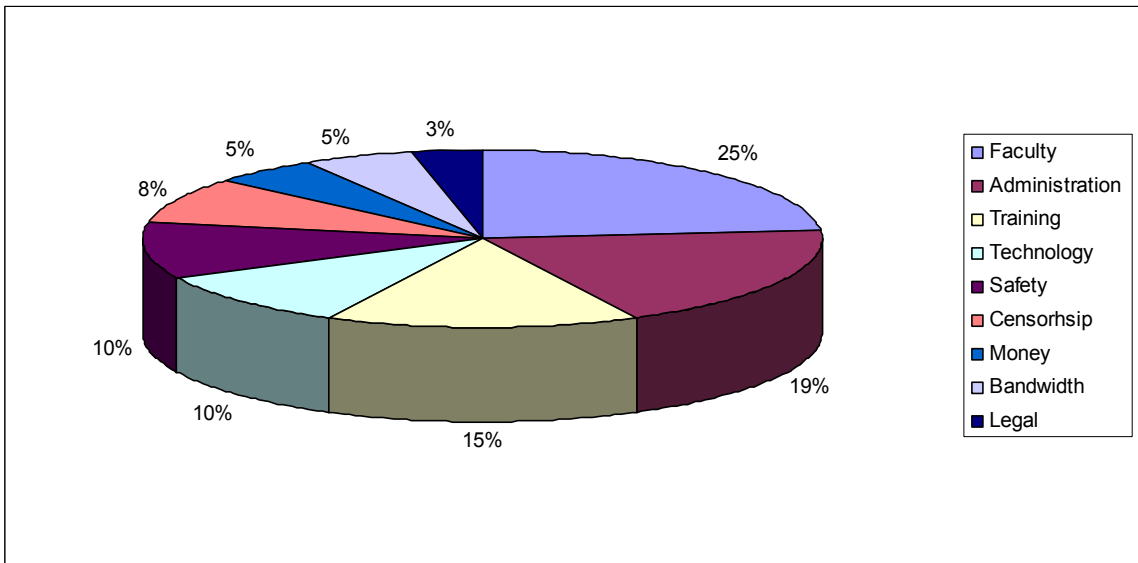
Figure 4. Primary Themes: Institutional Barriers to ESS Adoption

a primary but unsurprising finding of this research: the institutions and administrators of

education from local to national levels generally constitute obstacles to innovation.

The final step in working with the data from items 26 and 27 was the generation

of tag clouds from the sorted and re-categorized data. According to Wikipedia ("Tag

Cloud", n.d.) a tag cloud, referred to as a "word cloud" or "weighted list" in visual design,

is a visual representation of freeform text data (see Figures 5 & 6). Weighted lists have

been commonly used in cartography to represent the relative size of cities in terms of

typeface sizes used on maps, and these visuals have now become more commonly known,

as they are often used to depict keyword metadata (tags) on websites. Tags are usually

single words listed alphabetically, with the importance of each tag indicated by font size

or color. The cloud format is useful for expressing the relative prominence of terms in a

text. When used as website navigation aids, the terms are hyperlinked to items associated

with the tag. The tag clouds presented in this report were generated with Wordle, an

online application created by IBM researcher Jonathan Feinberg in 2008. Tag clouds are

a useful way to visualize text data, and an innovative and enlightening technology-

enhanced qualitative analysis technique. Parameters in the tag cloud creation software

can be set to produce different fonts, layouts, and color schemes.

A researcher can manipulate the clouds, reading the stories that appear, and

reacting intuitively and holistically. Imagination and non-linear thinking are encouraged,

and completely new and unique views of the data are possible. In contrast to traditional

graphic presentations, such as the pie charts used in Figures 3 & 4, this method of data

representation releases the data from imposed structure. At the same time, viewers are

pushed to consider, understand, and interpret the material in an individual and flexible

manner. The researcher relinquishes a degree of control at this juncture, moving to the

background and allowing individual response and interpretation to happen, thus opening

the possibility for expanded dialogues with the data and wider ranges of insight. In

general, the word cloud is an interesting and informative method of graphic data

representation. It has been adopted by analysts from some of the large Internet research organizations such as the Pew Research Center, as in Madden and Zickuhr (2011) "2011 Spring Tracking Survey of Adult Social Network Site Use".

Figure 5. Tag Cloud Generated from Survey Item 26 Sorted Data

A Summary of Participants' Thinking in Regards to ESS

The final survey item continued and amplified the previously established theme of allowing a more prominent hearing of the research participants' voices, and releasing some of the researcher's control over the structure of presentation and interpretation of data. The design of Item 28 played on the worldwide popularity of the Twitter microblog service by presenting a request for a constrained yet substantive response: "In 150 characters or less, summarize your thinking in regards to Educational Social Software."

Again, support for the use of this type of item can be drawn from some of the newest

major online research work available. For one of the items in the Pew Internet and

Figure 6. Tag Cloud Generated from Survey Item 27 Sorted Data

American Life Project survey instrument (Madden and Zickuhr, 2011), participants were

asked to provide a one-word response describing their experiences with the use of social

network sites. The text data was then presented in the research report as a word cloud, as

well as being categorized and displayed in a conventional table.

In the present study, analysis of the microblog data from Survey Item 28 revealed

that the 18 responses, when taken in their natural order as recorded by the survey

software, seemed to form a rough natural composition or dialogue. Upon noting this, I decided to create a crowd-sourced answer to Item 28 by combining the 18 microblog responses into an essay. This was done with minimal alteration in response order, and no editing other than the addition of transitions, conjunctions, and other common compositional elements for the purpose of enhancing coherence and readability. The result is presented immediately following as an authentic expression of respondents' ideas, without researcher comment. It provides an effective summary of participant viewpoints on ESS:

Educational Social Software provides 21st century tools for 21st century learners. When used in online delivery, ESS expands capacities for effective and collaborative distance education. Institutions, instructors, students, and society all benefit. ESS brings the learners closer together and makes digitally mediated learning more convenient and constructivist. The key value of ESS is how it enables learners to form new and novel connections between content elements and people. In higher education and graduate school settings, ESS gives more opportunity for the students to become more creative in their outputs and presentations. In addition, ESS is a great tool to educate the students that all students are equal, because it affords equality in access, contribution, and knowledge creation. ESS levels the playing field for teachers and students, as anyone can now access valuable libraries of information and use them to learn. This supports social learning theory as learning experiences are constructed collaboratively. ESS affords social identity and connects literacy, learning, and motivation. It further serves as a bridge between print practices and digital

literacies.

While ESS holds much promise, it is necessary for the private sector to converse with the education sector and stabilize implementation, because a full suite of ESS-type software and tools will eventually become an indispensable component of any course management system such as Blackboard. Teacher and students should overcome the fear factor, set privacy limits & jump in, with instructors modeling appropriate use. Although a few still dismiss ESS as a fad, many programs and instructors are beginning to find that ESS is a powerful tool to use in the delivery of the content, context, and process of teaching and learning.

ESS users say that it is a tool that is long overdue - and our students are using it already we need to get on board while the students like this mode and are into it. Social software is relevant and useful for some people, and is the best choice for many students and teachers, but it can be the wrong choice if potential users are not screened for technology capacity. However, adapting new users to ESS-enabled classrooms is merely a matter of spending the time needed to get better at using the software effectively. Moreover, the difficulty can be reduced via the use of ESS designed for school use rather than trying to force fit mass market products into classrooms. Products that are not specialized for school use are not safe and create too many headaches.

Summary of Research Results

Analysis of the data gathered in this mixed-methods study produced the following findings about the use of social network software and social media tools in educational practice:

- Of respondents who provided their age, most were between 41-60 years old.

- Of respondents who identified their occupation, most worked in K-12 or higher education.

- One respondent each reported working in medical, military, and nursing occupational fields.

- Most respondents (78%) used ESS in contexts that blended F-2-F contact with the use of online resources.

- Respondents reported using in their professional practices 28 basic types of tools that fit the definition of ESS as per Anderson (2005) and Lambropoulos and Romero (2010).

- An important general purpose of ESS use was support for communication and community building and content/assignment delivery.

- An important specific purpose of ESS use was the facilitation of contact, communication, collaboration, and community.

- Also viewed as important were practical and efficient content delivery mechanisms and flexible tool sets.

- Privacy and security concerns were not often mentioned in open-ended comments.

- During the asynchronous online nominal group process of data collection instrument development, many specific features were mentioned for inclusion in a rating of the relative importance of various ESS features. During survey development work, this list of features attracted the most revisions via the AONG process.

- Privacy controls were rated as being the most important feature of ESS.

- Following privacy controls in rank of importance were connection to networks of peers, connection to networks of experts, link sharing, and personal learning environments/spaces.

- All respondents perceived ESS capabilities to enable the development and support of learning communities as important or very important.

- General information sharing was identified as the best feature for the development and support of learning communities.

- All respondents perceived ESS capabilities to enable the development and support of social presence as important or very important.

- General information sharing was identified as the best feature for development and support of social presence.

- The importance of multimodal communication channels to the establishment and maintenance of social presence was supported.

- The importance of personal profiles to the establishment and maintenance of social presence was supported.

- The importance of non-text forms of communicative and information-sharing media in general to instructional practices was supported.

- Respondents regarded as important to instructional practices ESS capabilities to enable the development and support of transparent learning environments.

- Respondents indicated that transparent environments were best supported by text-based personal publishing tools, including document sharing via wiki.

- All respondents rated support for distributed content creation as important.

- Respondents indicated that distributed content creation was best supported by text

- Nearly 73% of respondents strongly agreed that "Educational social software is a viable tool for teaching and learning."

- Eighty-six percent of respondents agreed or strongly agreed that ESS could be a driver of paradigmatic change in educational domains.

- Eighty-six percent of respondents disagreed or strongly disagreed with the proposition that SNS use was a fad.

- Eighty-one percent of respondents disagreed with the proposition the ESS use is not a comparatively valuable use of class time in relation to other activities.

- Respondents indicated that student issues and difficulties with ESS itself were primary challenges to the implementation of ESS in their occupational settings.

- Respondents indicated that faculty skill deficiency and attitudes were the primary institutional barriers to the implementation of ESS in their occupational settings.

- Institutions and administrators of education from local to national levels generally constitute an obstacle to innovation.

- Participants felt that ESS has many potential beneficial applications in educational environments, particularly if such a tool were to be developed and built specifically for use in educational contexts, and adequate user training and support infrastructures were put in place.

CHAPTER 5. DISCUSSION AND RECOMMENDATIONS

In the United States, the number of social network site users is growing rapidly. A Pew Internet and American Life Project survey conducted in May of 2011 found about two-thirds (65%) of adult Internet users (18 years and older) reporting some experience with the use of social network sites (Madden & Zickuhr, 2011). Forty-three percent reported using an SNS "yesterday". That is more than double the percentage of adults (29%) who reported such usage in the 2008 edition of the survey, and it was the first time in the Pew Internet survey series that half of all adults reported social network site use. Among younger Internet users, as of September, 2009, 73% of online American teens aged 12 to 17 had used an online social network website (Lenhart et al., 2010), and 83% of young people ages 18-29 were using SNS by the spring of 2011 (Madden, & Zickuhr, 2011).

Social network sites serve important roles for student users by facilitating important social learning functions, engaging these young people in a range of complex literacy tasks, and providing a venue where they can seek peer support and help with school-related tasks from current and former classmates (Greenhow & Robelia, 2009). Majorities of student users of all ages have reported that education, and schoolwork specifically, are two of the most common topics of conversation on the social networking scene (Greenhow & Robelia, 2009; Greenhow et al., 2008; NSBA, 2007; Smith & Caruso, 2010).

If teachers are to leverage learners' everyday experiences in Web 2.0-enabled contexts in order to increase student engagement in content area learning, researchers need to address the roles teachers and schools can play in modeling and facilitating

learning through creative and participatory online practices (Greenhow et al., 2009).

Online practices of this sort increasingly center on the use of social network sites and the

social media tools associated with them, leading to the implication that social media

technologies must have a place in the educational setting. There is a vast range of

potential research topics related to SNS use in education, and a need for consistent and

ongoing analysis to establish the groundwork for what is sure to be a very prolific area of

investigation (Beer, 2008; boyd & Ellison, 2007). This study constituted a contribution to

a new and growing body of literature. Important and practical information was gathered

for use by educators who wish to know more about deploying an SNS as part of an online

or blended course, and many avenues for further investigation were suggested.

Purpose of the Study

The purpose of this study was the exploration of instructors' use of social network sites

as tools for teaching and learning, the provision of insight into a paradigm shift that is

occurring in the realm of digitally-mediated education delivery, and the creation of a

conceptual map modeling the use of social network software in support of constructivist

learning approaches.

Research Questions

1. What are educators' perceptions regarding the general utility, benefits, and drawbacks

of social network sites as educational tools?

2. What are the views of concerned experts and classroom teachers experienced with the

use of social network sites in their practice in regard to the potential of this technology to

engender paradigmatic change in educational domains?

3. To what extent do these data enable the development of a model for the use of social

network sites in teaching and learning?

Research Design

This study constituted a mixed-methods approach as per Creswell and Plano Clark (2007) in that the research involved "Collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies" (p. 5). Mixing of data types rather then relying on one type can provide a more detailed description of the phenomena under study, and offer countering advantages to offset any weaknesses inherent in each of the individual methodologies (Creswell & Plano-Clark, 2007). Johnson and Onwuegbuzie (2004) contend that mixed-method designs for empirical research support a methodological pluralism that may result in outcomes superior to those obtained via mono-method research.

The research design was operationalized via (a) the use of primary Internet research methodology (Hewson, 2003) to recruit participants, develop and administer data collection instruments, and collect responses, and (b) the application of both qualitative and quantitative analytic methodologies to the data collected. Data collection approaches included: (a) the use of an online nominal group technique in the development of a qualitative survey focused on generating answers to the research questions, (b) the online deployment of the qualitative survey, and (c) a thematic analysis of recent web log posts written by experts on social media and focused on the use of social network websites in education.

Data Analysis

Qualitative content analysis comprised the basic analytic framework deployed in the analysis of qualitative data produced by open-ended survey items. Qualitative content

analysis, or interpretive analysis, focuses on the evaluation and interpretation of qualitative information, leading to the formation of theory from the observation of messages and the coding of those messages (Fink, 2003a, 2003b; Neuendorf, 2002). Interpretive content analysis "involves theoretical sampling; analytical categories; cumulative, comparative analysis; and the formation of types or conceptual categories" (Neuendorf, 2002, p. 6). It is wholly qualitative in nature, with the analyst being in a constant state of discovery and revision (Neuendorf, 2002). In these features, interpretive content analysis can be recognized as corresponding closely with the precepts of qualitative data analysis and qualitative research in general as they are commonly outlined in the literature (Bryant & Charmaz, 2007; Charmaz, 2006; Corbin & Strauss, 2008; Cresswell, 2005, 2007; Denzin & Lincoln, 2008; Gay, Mills, & Airasian, 2006; Glaser, 1978; Glaser & Strauss, 1967; Strauss & Corbin, 1990; Strauss & Corbin, 1997).

Qualitative content analysis was operationalized via the use of Neural Network Analytic Frameworks (see Appendix D) for the processing of qualitative data, along with the thematic coding and analytic memo writing techniques common to interpretive content analysis and qualitative data analysis in general. As in other qualitative analytic methodologies, the objective was the formation of theory from the observation of messages and the coding of those messages (Fink, 2003a, 2003b; Neuendorf, 2002).

Quantitative survey data was analyzed by the on-board statistics package associated with the Opinio survey hosting software. Measures of central tendency (mean, median, and mode), and measures of dispersion (range, variance, and standard deviation) were produced for each quantitatively scaled item. As the study progressed, the quantitative data was iteratively revisited and further analysis was carried out by hand

and with Microsoft Excel. The tag cloud creation and text analysis software "Wordle" was also used to create weighted lists from some of the open-ended text responses. The lists were presented as word cloud graphics which represented a hybrid of quantitative and qualitative data analysis.

Discussion of Findings

In the following section, a reflective response to each of the three research questions is situated within an analytic context comprised of illustrative findings from the research, related background drawn from relevant literature, and expert viewpoints collected from the social media-sphere as well as from the researcher's own experience. In addition, supporting commentary has been drawn as *in vivo* data from participant responses gathered by open-ended survey items. Examples of such data are indicated by the use of quotation marks unaccompanied by citation.

Discussion of Research Question 1

(Research Question 1: What are educators' perceptions regarding the general utility, benefits, and drawbacks of social network sites as educational tools?)

Polling Google.

Social networks sites are now a significant aspect of worldwide online human culture. They have gained ubiquity and made an impact that at least some experts regard as positive. Nichole Ellison, responding to a February 15, 2008 blog post entry titled "Is MySpace Good for Society? A Freakonomics Quorum", stated the following:

I believe the benefits provided by social network sites such as Facebook have made us better off as a society and as individuals, and that, as they continue to be adopted by more diverse populations, we will see an increase in their utility. (Ellison, 2008, para. 1).

As documented in the preceding sections of this report, the massive scale of the online social networking phenomenon and the universal adoption of this technology by young people have ensured that there will be intersections between social network website use and the realm of formal education. It was the purpose of this research project to explore those intersections, with an initial objective of learning more about the potentials or shortfalls of social network sites as educational tools. As a departure point for discussion of the utility, benefits, and drawbacks of SNS use in education, I decided to take a look at "what's out there" on the Web in real time. The best way to do this was to conduct a digital-age literature review by polling Google.

> Like many others, if I wish to know what is the latest and most important research going on in my area, I am more inclined to turn to blogs and wikis than to journals and conferences. Traditional fora lag months or even years behind the current state of the art, whereas social software may tell me what happened yesterday or even today, and allow me to participate in its development. (Dron, 2007a, p. 63)

Dron (2007a) goes on to note that scientific breakthroughs are no longer confined to journals and conferences, breaking news is not exclusive to the established press, and Google search is often the first port of call (followed by Wikipedia) for those seeking understanding of an unfamiliar topic.

The Google search engine has become one of the most prolific sources of information the world has ever known. While the utility of Google for locating online information about nearly any topic is well-known, less familiar is the use of the search engine to gather a broad public perspective on a topic. Not to be confused with Google Poll, which is an application that can be used to conduct polls on user-selected topics,

Polling Google involves (a) posing a research question, (b) designing discriminatory search phrases that will generate results comprised of online information relevant to the topic of the question, (c) Googling the phrases, (d) recording the number, type, and content of results; and (e) using qualitative analytic techniques to derive answers to the research questions from the results data. Several iterations with modified versions of the original search phrase will operate to increase the resolution and granularity of the answers.

I polled Google December 15th, 2011 regarding the following research question: "Is the general Google perspective in regards to SNS in education positive or negative?" The initial search query used was "social networking sites in education". The poll produced about 5,040 results, a miniscule number for a Google search. The top hit was a Wiki entitled "Educational Networking" created by Steve Hargadon. Hargadon is a pioneer educational social network site creator and major proponent of the use of these sites in education, especially as loci for teacher professional development activities. Of the following 60 results, the only material that communicated a negative perspective on the use of SNS in education was found in pro/con debate style articles. At that depth in the results, replication of sources and derivative sources were predominant, indicating data saturation for this query. Results tended to be articles and blog posts, with a few PowerPoint slideshows and conference papers comprising the bulk of the academic material. A slightly modified search query, "social network sites in education" produced 3,310 results. This query was not as productive as the first one. Data saturation was noted after the 26 top results, and most hits were blog posts.

The results of this off-the-cuff research approach indicated that the general

perspective in regards to SNS in education was positive. The poll also demonstrated that the field of material concerned with social network sites in education is small in Google terms; at this point there is relatively little activity happening around this topic in the online realm. A more detailed look at the results revealed something else about the nature of the topic. Relatively many blog posts, pro/con discussions, presentation slideshows, conference papers, term papers, and reports of small action-research projects appeared in the results. This contrasted with the appearance of only two book chapters, and no dedicated books or major research reports. The impression is that the use of social network sites or ESS in education is a new topic, technique, or idea that is still in the process of becoming established. The overall viewpoint derived from the two polls was cautious optimism against a background of much discussion regarding the potential for SNS use in education.

In a November 30, 2009 blog post titled "Sociality is Learning", danah boyd proposed that "Rather than demonizing social media or dismissing its educational value, I believe that we need to embrace the environments that youth are using to gather and help them learn to navigate the murky waters of sociality" (para. 6). Although it is still new and largely untested in educational contexts, social media offers numerous affordances that are attractive to educators working in technology-enhanced environments. Teachers have been experimenting with social media tools as fast as they have appeared, and almost every social networking tool that has gained general popularity has been appropriated for some form of educational use (Johnson, Levine, & Smith, 2009). Social networking has already arrived in hundreds of thousands of classrooms, and has begun to transform instruction and help learners become more world-aware, communicative,

collaborative, and knowledgeable (McIntosh, 2008).

Benefits and utility of social network sites as educational tools.

An answer to research question number one was generated via research participants' numerous comments on the benefits and drawbacks of SNS use in teaching/learning contexts. The crowd-sourced commentary presented in the final pages of Chapter 4 of this report was developed from 18 micro-blog style responses to survey Item 28. It offers a snapshot of participant viewpoints regarding the benefits and drawbacks of using social network software in education.

In other parts of the survey, respondents supported the use of ESS as a tool to promote communication and community-building. They also thought it important to leverage the capability of ESS to enable the development and support of transparent learning environments (Dalsgaard, 2008) in which students are aware of and have access to the products generated by other students as they engage with course materials and activities.

The participants in this research identified a wide range and variety of potential benefits associated with the use of social network software in education. Taken as a whole, the body of text data content generated by the 14 open-ended qualitative survey items (Item #s 10, 11, 12, 15, 17, 19, 21, 22, 23, 24, 25, 26, 27, 28) included the following commentary (punctuation and capitalization added for readability) on the benefits of ESS in education:

"ESS extends delivery options and increases learner autonomy to select and use tools/spaces that she/he finds most appropriate in a particular context."

"ESS minimizes the use of paper & pen activity."

"Increase the contact time with students when they are out of classroom."

"These tools facilitate collaborative learning and a sense of community among students."

"I have had highly favorable experiences with social networks and blogs. I think both can help promote the development and growth of learning communities."

"Provide a safe, collaborative platform for students to share ideas and concepts as well as communicate with each other."

"(ESS) provide adequate engaging online education, and multiple avenues of success."

"Deep & sustained discussion, critical thinking, collaboration on projects, group critiques, authentic learning, develop learning products, innovation."

"Expand pre-service teacher's definition of what it means to literate in the digital age."

"Response to material without feeling the need for personal identity."

"I think the opportunity to gain peer feedback upon ideas or projects can help to enhance the overall learning experience of all students within the learning community."

"Allows students from around the world to see the work of other students."

"Features supporting content creation by all course participants can empower students and increase personal investment in learning."

SNS and other social software tools enable a different way of using the web within an educational context. These tools are flexible and offer many potential configurations of use, thus offering benefits individuated to the setting and purpose of their deployment. The use of social software applications in online education delivery encourages collaboration, while supporting self-direction and individuation (Dalsgaard, 2006). In contrast to standard content management systems, which are teacher/institution centric and emphasize content handling and two-way communication, social software

offers more interactivity and a distributed web of communication paths (Siemens, 2004b). In this way, social software fosters interaction, community feeling, and group motivation (Dalsgaard, 2006).

"Primary Sources: America's Teachers on America's Schools" (Scholastic, 2010) was one of the largest ever national surveys of American teachers. Researchers used a blind questionnaire to gather data from more than 40,000 teachers at all levels of the American K-12 public education system. Results showed that teachers have a clear understanding of the disconnect between students' use of technology in school and in their private lives. A strong majority (81%) of the respondents identified the effective integration of up-to-date technology into the classroom as absolutely essential or very important to impacting student achievement (Scholastic, 2010). Teachers consistently said that information technology in the classroom is an essential factor in engaging students and preparing them for success in the global marketplace. Few teachers thought that traditional textbooks could do the same; only 12% strongly agreed that textbooks help academic achievement, and only 6% strongly agreed that textbooks engage students in learning (Scholastic, 2010).

Among young people today, social network site use is one of the most familiar modes of interface with technology, and nearly all of them are participating in this activity (Smith & Caruso, 2010; Zickuhr, 2010). This fact alone constitutes a major benefit of ESS use: the ability to leverage what is already firmly established in the lives of most students. Yet schools are not using as teaching resources the technologies that so many pupils are familiar with (Luckin et al., 2009; Selwyn & Grant, 2009). Even as many teachers and school administrators continue to resist change and cling to textbook-based,

chalk and talk approaches, young learners are seizing technology and the pedagogy that goes with it. They are taking advantage of freely available online tools and information sources, and leveraging their social networks to gain access to peer-to-peer and expert-to-learner communication opportunities that move education beyond the walls and schedules of the school (McIntosh, 2008; USDE, 2010). The results of this research project indicate the likelihood that the use of educational social software is as one respondent noted: "Long overdue - and our students are using it already we need to get on board while the students like this mode and are 'into it'".

Drawbacks of social network sites as educational tools.

As with all disruptive technologies, integrating these social network spaces into existing structures of practice in a manner that renders them as legitimate and beneficial tools presents challenges. SNS use, social media use, and digitally-mediated delivery in general require innovative practice in which instructors are challenged to model the same skills they wish students to acquire and use (Reynard, 2007). Many educators, because of privacy, professional, and boundary concerns, have an understandable and even appropriate reluctance to take on the challenges associated with the use of social network software in school (Hargadon, 2009). Another obstacle is a lack of institutional support for the use of ESS, with the result that many of the early adopters of social network software for use in educational contexts have been forced to rely on the ubiquitous Facebook and other commercial applications (Smith & Caruso, 2010).

Selwyn & Grant (2009) point out the fact that "The enthusiasms that currently surround social software and learning are tempered by a host of corresponding concerns" (p. 81). Negative discourses have developed around issues related to social software use.

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For example, some see it as contributing to heightened disengagement, alienation and the disconnection of learners from education, and as a detrimental effect on "traditional" skills and literacies (Selwyn & Grant, 2009). Some elements in the education community have proposed that social software could be a contributing factor to the intellectual and scholarly degradation of a "Google generation" of students who are incapable of independent critical thought (Brabazon 2007; Carr, 2008). As a participant in this study commented, "things like FB are blocked in school".

More practical difficulties include the fact that technological fluency among young people is not as deep or widespread as the "digital native" meme once implied (Kennedy et al., 2007; Selwyn & Grant, 2009; Vaidhyanathan, 2008). Every type of software has a particular interface and a specific tool set, and just because students are adept with their MySpace or Facebook pages does not mean they will easily or readily adapt to using a school-provided ESS tool. Deficiency in the basic skills required to use a communication medium will mean that learners must spend inordinate amounts of time learning to interact with the technology if they are to be able to use it to learn (Gunawardena & McIsaacs, 2004).

Moreover, "As instructors experiment with ways to integrate social networking into their curriculum, some are finding that there is a line beyond which students will consider the contact an invasion of their private world" (Smith & Caruso, 2010, p. 79).

I really don't want school (or my job) butting their nose in my social networking. If I am required to use those sites for school/work, I'll stop using them or create fake accounts to keep my recreation separate from my work/school/need-to-be-responsible-and-serious type activities. The idea of school admin. (sic) or anyone

else in authority using my social networking to 'check up' on me freaks me out and I will go to extremes to limit that. (research respondent in Smith & Caruso, 2010, p. 80)

Many young people view the online social space as personal, and a place to get away from school and adults (boyd, 2008; Luckin et al., 2009; Smith & Caruso, 2010). Work by Luckin et al. (2009) with teenaged students revealed that when students were asked about bringing social networking into school as an educational tool, they generally continued to visualize it as being used for socialization instead of learning (Luckin et al. 2009). Clearly, adaptation of the commercial versions of social network software that students are already using is not a feasible way to satisfy the requirements of SNS use in education contexts.

Participants in this research project voiced similar concerns in response to items that asked them to identify challenges to implementing the use of SNS in their own practices:

"Students getting off task unless the parameters are well established."

"Safety concerns, privacy issues, supervision of posting content/moderation skills of other faculty."

"Three things must be in place, that often are not: reliable technology and Internet connection, computer/technology literacy and potential, and some degree of self-discipline, or for young students, close adult supervision."

"The biggest barrier in my 9 years in teaching of teachers online is that the technology is too intimidating for students to navigate complicated environments."

"Digital learning environments are not being designed to adequately address the range of

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technology skills of users, starting with novices."

"General market tools (Facebook, Ning) that are NOT designed for education are difficult to retrofit."

"Ning and Facebook are not appropriate for educational use."

"Many ESS tools do not meet the technical standards required to gain TRUSTe© certification for child privacy protection."

Another issue to consider regarding SNS use is the quantity and relative complexity of administrative work that must go into designing pedagogy and materials for use in the SNS-enabled course, and into building and managing the necessary online infrastructure. The latter consideration reflects on a critical design issue regarding both CMS and ESS systems: the systems must be built for efficiency of use by course administrators. For example, a respondent in this research project noted the importance of having "Grade books that gather discussion and wiki entries in one place for grading efficiently". Incoming student material must be easily accessible and assessable. The instructor must be afforded the capability to click quickly through a single user's input, even though that input may be located within disparate tool functions, or presented in a variety of modes.

In addition, there is a need for readily usable private, public, individual, and group communication channels. Instructors should be able to build and administer various types of assessment instruments with minimal effort, and test results must be automatically collected and securely stored. It should also be possible to transfer materials and data from the ESS to other software tools. The practical working imperatives of the classroom teacher must be accounted for in the way a given piece of ESS is designed and operates.

However, as a respondent noted, "Educational Social Software is often designed by technical people rather than by learning experts".

The question of pedagogy places the instructor up against absolute physical limits that arise when course or student requirements for student-teacher interaction exceed the instructor's capability to provide that interaction. For example, when a class engages a series of exercises that require students to create blog posts on the one hand, and participate in discussion forums on the other, a large amount of material will be created. Generally, the instructor must account for it all, and respond to it in one way or another, or in a combination of several modes. No matter which response method is chosen, time and effort must be invested. Anderson (2005a) notes that there are few examples of cohort-based online education programs that support more than 30 students per teacher, because such models of delivery require more time expenditure than equivalent classes delivered on campus. Respondents in this study made the same observation: "It may take more time on the part of instructors and students to utilize ESS capacities to their full capacity within a distance education environment." "I have to spend more time to the site to check students' work and progress apart from those on paper because some students are more comfortable writing online than on paper. It is difficult to correct students language problem when they blog or participate in discussion."

Other noted obstacles to the widespread adoption of ESS were the attitudes and capabilities present among instructors. In higher education, seemingly the most potentially fertile ground for the establishment of new education delivery tools and techniques, there is a well-established trend toward non-adoption of new technologies, and higher education faculty remain laggards in adopting social network software and

other technology innovations (Roblyer, McDaniel, Webb, Herman, & Witty, 2010; Smith & Caruso, 2010). Data from the spring 2009 "Faculty Survey of Student Engagement" (FSSE) revealed that the overwhelming majority of approximately 4,600 faculty members at 50 U.S. colleges faculty were not using IT tools beyond course management systems ("Professors' Use," 2009). Participants in this research showed awareness of this gap in faculty adoption of new delivery tools, and noted that "Teachers need to learn to use ESS effectively in order for learners to benefit from them". In addition, respondents observed that, in many instructional contexts, "no support or training for ESS technologies" is offered.

According to the National Forum on Information Literacy (NFIL), information literacy is a constellation of competencies revolving around information use and associated practices. It is the ability to correctly identify a need for information, locate, evaluate, and effectively use that information (NFIL, n.d.). Information literacy is the foundation for effective lifelong learning and personal and professional empowerment (NFIL, n.d.). Academic practices and professions have traditionally been built around information literacy, and it is likely that most teachers are competent in this area. What may be lacking among faculty is digital literacy, or the ability to competently use a variety of information and communication technologies (software and hardware) in the workplace and/or the classroom (NFIL, n.d.). There is a need for revision of assumptions regarding the literacy skill sets needed by education professionals at all levels, and provision of the professional development necessary to remediate deficiencies in this area.

Research question 1 findings summary.

The findings of this research project included an answer to research question 1:

What are educators' perceptions regarding the general utility, benefits, and drawbacks of social network sites as educational tools? Educators perceived SNS as being potentially useful, and offering many capabilities that could contribute to the delivery of content and the provision of communicative, collaborative, constructivist learning opportunities. The affordances the sites can offer for extensive and intensive communicative interaction, and for community-building interactions, were repeatedly emphasized in the data. Complications, difficulties, and drawbacks were noted as well, and tended to focus on lack of knowledge and capability on both user and administrator/provider sides of the equation. These perceptions were generally validated in the literature by similar observations that have been made by other researchers and users exploring the role of social network sites and social media as educational tools.

Discussion of Research Question 2

(Research Question 2: What are the views of concerned experts and classroom teachers experienced with the use of social network sites in their practice in regard to the potential of this technology to engender paradigmatic change in educational domains?)

The normal education paradigm in crisis.

According to Thomas Kuhn's (1996) work in "The Structure of Scientific Revolutions", two characteristics define a paradigm: a level of unprecedentedness and novelty sufficient to attract an enduring group of adherents away from competing activity, and a degree of open-endedness sufficient to provide a wealth of problems for the redefined group of practitioners to solve. Adherence to a paradigm transforms a group of practitioners into members of a profession or discipline, from which issues the formation of specialized journals, foundation of professional bodies, and claim to a special place in

academe (Pajares, n.d.). The primary objectives of much of this effort are further

delineation of the chosen paradigm, and defense against competing paradigms (Kuhn,

1996).

> Normal science is predicated on the assumption that the scientific community
>
> knows what the world is like. Much of the success of that enterprise derives from
>
> the community's willingness to defend that assumption, if necessary at
>
> considerable cost. Normal science often suppresses fundamental novelties
>
> because they are necessarily subversive of its basic commitments. (Kuhn, 1996, p.
>
> 5)

Following Kuhn (1996), "normal education" can be taken to mean educational

theory and practice firmly based upon one or more past achievements significant enough

to be accepted by practitioners as the foundation for further practice, and as definitive by

succeeding generations of practitioners. This normal education is what can be said to

constitute the paradigm for the professional field of education.

To paraphrase Kuhn (1996), normal education is predicated on the assumption

that educators know what the world is like. Much of the success of the educational

enterprise derives from the willingness of both educators and society at large to defend

that assumption at whatever cost is necessary. Fundamental novelties will often be

suppressed merely because they are subversive to commitments to the accepted paradigm.

However, Kuhn posits that:

> So long as those commitments retain an element of the arbitrary, the very nature
>
> of normal research ensures that novelty shall not be suppressed for very long.
>
> Sometimes a normal problem, one that ought to be solvable by known rules and

procedures, resists the reiterated onslaught of the ablest member of the group within whose competence it falls. (1996, p. 5)

A problem has arisen within the normal education paradigm in so far as the principle and delivery of universal public education is in crisis on what is arguably a worldwide scale (Daniel, 1996, 1997; Giroux, 2004b, 2007a, 2007b). Economic malfunctions at international, national, and community scales have led to reductions in allocated social resources and narrowing of the availability of public services of many types. Corruptions and inequalities in the distribution of wealth and power have driven the subversion and co-option of the principles and purposes of the public educational enterprise itself (Giroux, 2004b, 2007a, 2007b). Global-scale shifts in demography and lifestyle have thrown imbalances into the system that push existing soft- and hardware infrastructures beyond their design limits (Daniel, 1996, 1997). These are problems that have resisted the onslaught of the ablest members of the educational enterprise.

At the same time, it becomes apparent that many of those charged with the design and direction of the education system either do not know or do not accept the world as it is now. New discoveries and other anomalies are violating the paradigm-induced expectations that govern normal education. These anomalies are pushing the limits of the accepted paradigm and, as per the model proposed by Kuhn (1996), creating a crisis situation as outlined by Javaid (1997) in which the gestalt switch from old paradigm to new threatens to divide the field into defenders of the existing paradigm and proponents of a new paradigm.

The introduction of ubiquitous networked technology into the lives of a majority of the young who make up education's core service constituency represents a very

significant anomaly. This is a novelty both potent and distributed to the degree necessary to allow it to escape suppression and effect paradigmatic change. In the view of this researcher, the change that is afoot can be summed up concisely as follows: Educational institutions and pedagogies designed around hierarchy, control, information restriction, limited-access knowledge dispensation, and one-to-many broadcast information delivery are giving way to an emergent paradigm evolving in response to a social context ruled by collaboration, openness, information abundance, distributed access, social forms of knowledge construction, and many-to-many information sharing.

As danah boyd commented, social media "has affected how people interact with one another and, thus, it has the potential to alter how society is organized" (2008, p. 93). Likewise, in the context of education, technology is removing the barriers and bridging the channels that have traditionally served to organize and maintain hierarchical institutional management structures dedicated to the control and limitation of access to knowledge and information.

More control of the learning process is now being placed in the hands of the learners (Bonk, 2009; Saljo, 2010; Smith & Caruso, 2010). Students are using handheld devices to access a range of cloud-based resources provided on the consumer market. These suites of web-based communication and collaboration tools are being used to both supplement and bypass institutional technology systems (Smith & Caruso, 2010). Furthermore, large quantities of information on nearly any topic are potentially available to most students and accessible within seconds, including and beyond any data bases provided by educational institutions. This has the potential to disrupt existing hierarchical systems of information control, and decentralize power distributions at the classroom and

institutional level alike (Saljo, 2010; Siemens, 2006b). This comprises a movement

toward what Bonk describes as "a new culture of learning where we assume radically

new perspectives of ourselves as learners and what it means to participate in the learning

process" (2009, p. 327).

The idea that education is undergoing major change is not actually controversial;

even a summary scan of either the popular or scholarly literature will reveal widespread

agreement that major, disruptive changes are afoot. Economic, demographic, and social

shifts are combining to push higher education into what could be a challenge to survive in

any form that resembles what has been known in the past, and K-12 public schooling

faces similar problems (Ambient Insight, 2011; Armitage, 2005; Aronowitz, 2000;

Aronowitz & Giroux, 2003; Baraniuk, 2006; Bonk, 2009; Daniel, 1996; Giroux, 2004b;

Giroux, 2007a, 2007b; Hall, 2011; Hebel, 2010; USDE, 2010). Along with the reshaping

of education as an institution, the rapid pace of change in modern life, massive amount of

information necessary to deal with daily tasks, ever-shorter knowledge half-life,

increasing need to engage in life-long learning, and loosening institutional grip over the

learning process are forcing people to learn differently than they did in the past

(Greenhow et al., 2009; Kim, in Smith & Caruso, 2010; Nastu, 2010; Rovai et al., 2008;

Saljo, 2010; Siemens, 2006a, 2006b; USDE, 2010).

Transformational change in education is also embodied in the new relationships

between the producers and warehousers of knowledge and information and the

consumers of that material. The age of scarce, centralized knowledge is over, replaced by

the age of information super-abundance (Bonk, 2009; Siemens, 2006b). "Our society is

being restructured to align with knowledge. The barriers, inhibitors, obstacles, and

unnecessary structures are giving away to models which permit effective knowledge creation, dissemination, communication, personalization, and flow" (Siemens, 2006b, p. 69). The Internet has unleashed nearly unlimited access to information. It has increased equity in the distribution of information from traditional sources such as libraries, books, museums, and educational institutions, and driven the development of increasingly simple and user-friendly tools that can be used to search for, sort, and process information. This context of information abundance and open access is changing long-standing conceptual models of knowledge, learning, and teaching (Bonk, 2009; Iiyoshi & Kumar, 2008; Saljo, 2010; Siemens, 2004a, 2006b), leading to the possibility of paradigmatic change in educational domains.

Educational social software as an agent of paradigmatic change.

In a May 14, 2011 blog post, "The Case for Online Social Networking in Education", José Picardo wrote that:

Learning from one another is one of the deepest forms of learning our students ever experience. When effectively implemented, online social networking allows our students to continue learning from one another, under our guidance, beyond the school's walls. Social networking can be used to knock down the school's walls and bridge the gap between home and school, but first we need to knock down the firewalls. (para. 26).

Social network site use has crossed cultural boundaries with ease to be adopted by young Internet users worldwide. Facebook, the most heavily-used SNS, has over 700 million users in 134 countries (Wauters, 2011), and there are other major social network sites operating in some very populous regions around the world. For instance, there are 470

161

million Internet users in China, and the Sina Weibo (140 million users) and RenRen (31 million users) social networks are very popular among young people there (Tan, 2011). Mixi, Orkut, and Cyworld are popular in Asia and the Pacific Islands; many residents of India use LinkedIn; Orkut and Hi5 have millions of users in South America and Central America ("Social networking services," n.d.). In the United States, 65% of all online adults are using an SNS (Lenhart et al., 2010) and it is generally accepted that the use of these sites is now a near-universal factor in the lives of young people (Smith & Caruso, 2010).

These numbers indicate a transformative socio-cultural force that has already had lasting impact on social life as a whole. As Internet connectivity and mobile digital tools become increasingly pervasive, the hybrid learning spaces being created are altering the foundational principles that shape our definitions of knowledge and education (Anderson, 2004, 2006; Bonk, 2009; Greenhow et al., 2009; Saljo, 2010; Siemens, 2006b). Students can now leverage the power of Internet-capable hand-held devices and the ubiquity of social media use to create their own information-rich environments independent of any institution or instructor, and outside the control of the IT professionals who determine how (and what) technologies are utilized on campuses (Yanosky, forward, in Smith & Caruso, 2010). Students are creating their own engaging learning experiences outside of school, experiences that are often radically different from those they are offered in school (USDE, 2010).

Findings from the present study indicate that instructors are aware of the potential for tools built on the principle of social network sites to act as change agents in educational contexts. Respondents agreed that the use of educational social software

could lead to the development of new models of education and training centered on students as the creators of individual life-long learning processes rather than on institutions and teachers as controllers of educational processes and dispensers of knowledge.

In addition to offering numerical support for the transformational potential of ESS as an educational tool, survey respondents left implicit markers of their position throughout portions of the qualitative data body. For example, when respondents were asked to identify the foundational educational ESS tool(s) they used as part of their professional practice, responses covered the gamut of social media, about 74 of 87 identified tools were commercial applications available on the public Internet. Observing the choices made by members of a group and analyzing the impacts and implications of those choices is a standard qualitative observational technique (Corbin & Strauss, 2008; Creswell, 2005, 2007; Strauss & Corbin, 1990). This finding was indicative of the practical situation in regard to useful and attractive institutionally-hosted social media tools: there are few.

The further implication was that educators were strongly motivated to deploy social software in their practices. For one thing, they were expending the effort and taking the risk involved in building and using technology infrastructures outside of employer-provided systems. In addition, it can be inferred that they were using commercial social software to remediate a lack of access to specific types of tools, and that such access was desirable enough to be worth going out of the way for. Smith and Caruso (2010) also found faculty members going outside their institutional software infrastructure to use desired tools. Evidence like this supports the arguments that

paradigmatic change in educational domains is already extant, and that these respondents have embraced the new paradigm, as indicated by the fact that they did choose to use many types of social software in their instructional practices and were willing to go to some lengths to do so.

In order to consider the potential of social network sites, along with social media in general, as drivers of paradigmatic change in educational domains, it is important to recognize the source of these tools' power as change agents. Social software does have the potential to allow users to project an intensified social presence, communicate in new and multiple modes, and engage expanded opportunities for interaction in any online course environment. However, it should be recognized that the key disruptive factor at work is not simply the use of what is merely the latest in a long line of educational content delivery and communication support technologies. The primary disruptive affordance of ESS lies in its potential to change the power distributions and relationship structures surrounding the educational transaction (Christensen, Horn, & Johnson, 2008).

ESS empowers flattened connectivist-type relationship structures instead of hierarchical order among participants (Dalsgaard, 2006; Siemens, 2004b). ESS gives learners access to many communication and broadcasting tools that were formerly the sole province of the teacher/presenter. Instructor positioning as equal and facilitator rather than superior and director is overt. For example, the instructor's profile is just one among many similar pages, and the instructor may be readily accessible beyond any limits of formal class or office hours, and through the same communication channels that connect the students to each other. Likewise, the instructor's role as a co-learner is foregrounded because the use of social media tools often pushes much of the technology

and materials management work into the public view, so learners can see instructors' mistakes and successes with the technology. Finally, access to information, opportunities to assume expert roles, and capabilities for the creation and presentation of content are more equitably distributed between learners and instructors.

As Terry Anderson posted on April 29, 2009, "Social networking is a very disruptive technology that challenges many of our notions of privacy, individual and institutional control - generally moving control from the institution and the teacher to the learner" (para. 7). By selecting the SNS as the tool most useful in meeting the demands of their respective contexts of practice, respondents in this research engaged the primary disruptive affordance of ESS. They chose to share out aspects of power and control over educational transactions in a manner that was more equitable than what has been common in past models of education. Learners in these instructors' courses were empowered to extend and control their projection of visibility and presence beyond limits imposed by older interaction designs. Moreover, they were able to do so with a degree of autonomy and independence from the institution. The flattening of hierarchy and movement toward the equalization in the capability to project visibility and presence are key elements of the social-media driven paradigmatic change in educational practices and environments. By their selection of technology tools that support and foreground these elements, participants in this research project tacitly implied the power of the social network site to engender paradigmatic change in educational environments.

Distributed content creation and paradigmatic change.

The advent of Web 2.0 has given rise to possibilities for new types of collaborative content creation such as the large-scale cooperative efforts that take place

during the development of open source software, in the collaborative extension and editing of the Wikipedia, or in the communal world-building of Second Life. These are forms of user-led content production built on iterative, evolutionary development models in which communities of participants make incremental changes to the established knowledge base, enabling a gradual improvement in quality which can sometimes be more efficient than conventional industrial models of product development (Bruns, 2008).

These modes of content creation are more closely aligned with the emergent organizational principles common to social communities than with the predetermined, hierarchical, and rigid governance structures associated with traditional corporate activity paradigms. In this new model of content creation, the collected, collective intelligence of all participants is harnessed, and each individual may contribute where they are most capable (Bruns, 2008). When a community engages in collaborative creation and extension of knowledge, distinctions between the producers and users of content fade into comparative insignificance: "In many of the spaces we encounter here, users are always already necessarily also producers of the shared knowledge base, regardless of whether they are aware of this role - they have become a new, hybrid, produser" (Bruns, 2008, p. 2).

Social software enables new models of collaborative content creation by affording users the ability to create and modify online content without employing specialized programming ability. This is one of the primary affordances of social software tools (McLoughlin & Lee, 2007). Social software also enables the types of fluid interactions among users, and with data, that may encourage and lead to the creation of user-generated online content (boyd, 2007). These social software affordances can be

leveraged within an operational framework derived from the general field of digital content creation to support "distributed content creation". This term implies a decentralized content creation process, with involved user/creators separated by time and/or geography, yet linked via a common set of networked tools, and a central storage repository for the content being created or modified (Shaw & Venkatesh, 2005).

In education, distributed content creation capabilities may be incorporated within content management systems. While the typical content management system supports an instructor-centric model of content creation and distribution, this can be changed to a more open and inclusive model by the addition of social media-type components or systems, as in educational social software. Mark Horton, commenting on Web 2.0 and social media tools in a November 2, 2010, blog post, observed that:

> Blogs, wikis and private social networks are making a significant impact on how teachers teach, and students learn, bringing collaboration and knowledge sharing to new levels in today's academia. These tools aren't the complete solution to solving some of the challenges in education, but it is (sic) certainly helping teachers and students with new ways to interact in the classroom. (para. 6)

ESS provides spaces and structures that support new models of collaborative content creation and distribution open to all participants in educational transactions. ESS changes the power dynamics of the producer/consumer relationships present in the educational enterprise. By doing so, social software technologies used in the context of education and training delivery have the potential to neutralize traditional hierarchical and sole-source models of content management and enable all course participants to participate equally in both content creation and distribution. This potential for equitable

participation constitutes paradigmatic change in existing educational domains.

In regions where adequate access to the Internet and associated networked technology tools is available, students have embraced their new role as potential content creators. Results from a study of 36,950 U.S. undergraduate students include the finding that content creation and sharing is now a common activity among college students (Smith & Caruso, 2010). Forty-two percent of the students reported contributing video to video websites at least once per year, and more than a third of respondents had contributed to wikis (39%) or blogs (36%) at least that often. Updating microblogs such as Twitter was an even more common activity, and 43% of the participants had participated in this activity. Seven out of ten of the students in this study (71%) had done at least one of these four activities, and 12% had engaged in all four within the past year (Smith & Caruso, 2010).

This engagement in content creation activity is not limited to older students. Surveys of thousands of K-12 students, parents, teachers, and administrators over the past seven years by the Speak Up National Research Project has revealed a student profile that is captured in the description "Free Agent Learner" (Project Tomorrow, 2010). These students are taking a proactive, independent approach to learning in which schoolhouses, teachers, and textbooks are no longer the sole source of educational tools and information. Instead, the students are engaging the technology that is already a central part of their everyday lives, and using it to access a "wide range of learning resources, tools, applications, outside experts and each other to create a personalized learning experience that may or may not include what is happening in the classroom" (Project Tomorrow, 2010, p. 2). Communication with others still ranks at the top of students' purposes for

technology use, but creation and sharing of content also appears among students in grades 6-12 in much the same way it does in surveys of college students.

Younger students are also moving beyond the production of the relatively simple text-based digital artifacts. For instance, 8% of students in grades 9-12, and 9% of those in grades 6-8 reported having created videos or podcasts for the purpose of sharing knowledge (Project Tomorrow, 2010). A majority of these young students have access to one or more tools from a range of electronic devices that are capable of being used for interaction and creation within learning environments, and many of these are mobile technologies such as laptops, tablet computers, and netbooks, along with Internet-capable mobile phones and Mp3 players.

The biggest obstacle the students face is not related to difficulty of material or demand for advanced technical skills. Instead, students in grades 6-12 reported that the major obstacle to their use of technology was institutional prohibition of the use of personal smart phones or Mp3 players in school (Project Tomorrow, 2010). Outside of school, content creation was a primary focus of student use of technology tools and resources, with 40% of 6-8th graders and about 41% of high school students engaging in the creation and manipulation of digital media in their personal lives (Project Tomorrow, 2010).

It is becoming clear that today's students are not easily reached or well-served by the industrial age education model. Powered by the Web, active participation in learning that takes the form of collaborative knowledge production and educational content creation is emerging as the new foundation of effective schooling (Tapscott & Williams, 2010). Student production of course content is linked to one of the critical outcomes of

technology-enhanced learning: the learning afforded by interaction with the medium and machine itself (Palloff & Pratt, 2007). Students learn not only about the operation of technology in use for the course, and how it can be used in the construction of knowledge and furtherance of their own learning, but also about the process of learning itself as they make choices and engage in reflection during the decision-making and generative processes associated with content production (Palloff & Pratt, 2007).

George Couros, blogging at Connected Principals.com on March 25, 2011, posted the following:

I have said this many times before, that education is based upon relationships. While people often look at social media is just "technology" we have to see how proper use can help really bring our world together. If we are proactive in the way we work with kids using social media, there is no limit to what we can do. (para. 8)

Most of the respondents in this research project felt that ESS capabilities to support content creation by all course participants were important to their instructional practices. This movement to leverage the potentials of distributed content creation is another example of these educators' acknowledgement and embrace of the potential of social network sites to engender paradigmatic change in educational domains.

Transparency and paradigmatic change.

George Siemens, blogging on November 10, 2011, discussed collective learning activities from a network viewpoint:

I don't see networks as a metaphor for learning and knowledge. I see learning and knowledge as networks. In global, digital, distributed, and complex settings, a networked model of learning and knowledge is critical. Most disciplines in

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society have become too specialized to function in isolation. Global problems are too intractable to be tackled by any structure other than networks. Generalists have given way to connected specialization (as evidenced in the identification process of the corona virus (SARS)). Everything – form fixing my car, to my morning coffee, to my research, to my mobile phone, to healthcare - is a function of connected specialization. Novelty and innovation arises when we collide ideas or specialties that previously had not been brought in relation to one another. (para. 10)

In Siemens' (2011) reflection, the utility of networked models of learning and knowledge is based on the assumption that individuals will be aware of and able to access the knowledge and work of others when needed. One of the primary affordances of the educational social network site is the capability to support increased awareness of the activities of other individuals within the network through indirect communication and sharing (Dalsgaard, 2008; Dalsgaard & Paulsen, 2009). Dalsgaard (2006, 2008) referred to this increased awareness as transparency, and proposed that the ability to support transparency between students working in asynchronous online environments was one of the primary pedagogical affordances of educational social software.

Most stages of the learning process, from information gathering and note-taking, through assignment production and submission, to the reception of feedback, evaluation, and even grading, are amenable to being carried out in a transparent environment. Transparency can be an important driver for improved quality, as poor contributions from teachers and course designers cannot easily be hidden behind closed doors. This may reduce the number of low quality contributions and make high quality work more

accessible as an example for others (Dalsgaard & Paulsen, 2009).

Modes of usage drive transparency, and it is the prerogative of instructors, participants, or other program administrators to leverage tool sets to establish the degree to which interaction, production, and evaluation will be moved into public spaces. In regards to this, Dalsgaard & Paulsen (2009) note the importance of finding a suitable transparency level. Transparency must be handled carefully, as users must be assured of privacy, empowered to choose preferred privacy levels, and apprised of the control these choices will have over how much of their personal data and contributions will be available to others (Dalsgaard & Paulsen, 2009).

In addition to being driven by modes of usage and tool choise, the production of transparency is also linked to the collective structures manifested by participants in ESS-supported instructional contexts. These structures may occur on a range of scales as broad as the reach of the Internet itself. They can certainly be global, as evidenced by one response in this research that mentioned a global social learning network (www.epals.com) that "allows students from around the world to see the work of other students, in multiple languages, for free". Potentials for and degrees of transparency, as balanced against perceived needs for privacy and security, will vary along with the type of organizational entities produced by and involved in particular online learning activities.

Dron and Anderson (2007) suggest the possibility of three distinct entities that may be associated with and involved in activities supported by the use of social software: the group, the network and the collective. Groups are relatively small, and composed of individuals who see themselves as part of a group (Dron & Anderson, 2007). Often formed for short time periods in order to complete specific tasks or otherwise time-bound,

groups are more likely to be tightly knit, constrained and restrictive in membership and access, and protective of the privacy of member interactions and productions (Dron & Anderson, 2007). In contrast, networks are fluid and generative, and consist of distributed individuals who may be connected directly or indirectly. Networks are generally less restrictive than groups, and are often designed to allow open access and exit, facilitate the free-flow of information, and afford the search and harvest of information (Dron & Anderson, 2007). Networks can be seen as being more open and natively transparent than groups. Finally, collectives are completely open. They are emergent rather than designed; they are aggregations formed of the actions of individuals who do not see themselves as a part of a group or connected through a network (Dron & Anderson, 2007). Collectives often produce and increase visibility of both content and membership, and the productions of a collective would usually be accessible on a larger scale than those of a network or group.

Tool choice, modes of usage, and the particular collective structures manifested by participants in ESS-supported instructional contexts are all linked to the production of transparency in those contexts. A fourth factor key to initiating movement towards enhanced transparency is instructors' awareness of the need for transparency. Respondents in this research project demonstrated their awareness of the potential benefits of transparency by confirming the importance to their instructional practices of ESS capabilities to enable the development and support of transparent learning environments "in which students have awareness of and access to the products generated by other students in the process of engaging with course materials and activities".

Transparency is nearly synonymous with openness and visibility, and therefore

can be associated with open education models that are growing in scope and influence, and appearing to promise ever-increasing levels of access, choice, and flexibility for teachers and learners alike (Bonk, 2009; Iiyoshi & Kumar, 2008). "A key tenet of open education is that education can be improved by making educational assets visible and accessible and by harnessing the collective wisdom of a community of practice and reflection" (Iiyoshi & Kumar, 2008, p. 2).

The model of transparent educational transaction proposed by open education proponents such as Bonk (2009), Iiyoshi and Kumar (2008), and Siemens (2006b) is a novelty that is attracting adherents away from older models, while still offering many areas for research and discovery as it develops. It therefore fulfills Kuhn's (1996) requirements for identification of a potential new paradigm. Educators who have a raised awareness of transparency, and who take steps to promote it and let their learners profit from it, constitute early adopters who are being attracted away from the old paradigm and may become the adherents who work to define and support a new paradigm. By acknowledging the power of ESS to enable transparency, respondents in this research confirmed the capability of educational social network software to engender paradigmatic change in educational domains.

Research question 2 findings summary.

The findings of this research project included an answer to research question 2: What are the views of concerned experts and classroom teachers experienced with the use of social network sites in their practice in regard to their potential to engender paradigmatic change in educational domains? Themes expressed in the data regarding participant views of the use and importance of various features of educational social

software indicated apparent acceptance of SNS-type tools as potential agents of paradigmatic change (as per Kuhn, 1996) in educational domains. Respondents made substantial commitments to working in support of a new paradigm, and some participants referred to overt deployment of ESS tools to disruptive effect on existing structures of power and control in the educational environment.

Discussion of Research Question 3

(Research Question 3: To what extent do these data enable the development of a model for the use of social network sites in teaching and learning?)

A rationale for using social network sites in teaching and learning.

Anderson (2009) suggested that a pedagogical rationale for the use of social networking in all forms of education has been developing in tandem with the social theories of education of the past century (Bandura, 1977; Vygotsky, 1978). At the heart of these theories is the conception that learning is supported by social interaction. The rationale has been further advanced by ideas proposed around self-directed learning and heutagogy (Hase & Kenyon, 2000), research into the value of learning communities and the projection of social presence into them (Garrison & Anderson, 2003; Haythornthwaite et al., 2004; Palloff & Pratt, 1999, 2005, 2007; Rheingold, 1993), and proposals for new conceptions of learning and knowledge itself (Saljo, 2010; Siemens, 2004a, 2006b). All these take-offs on social learning theory are similar in that they generally value social interaction and its power to motivate, model, validate, support, challenge, and provide new perspectives throughout the learning process (Anderson, 2009).

These new refinements of earlier theories also acknowledge the central role of technology in the support of human communication and information management

(Anderson, 2009). "In an increasingly consumer-oriented education economy, the learning experience must be compelling and motivating to learners" (Anderson, 2008, p. 172). For better or worse, many of the young people who live in modernized societies today have been generalized as members of the Net Generation (Oblinger & Oblinger, 2005; Tapscott, 1999, 2009), or Digital Natives (Prensky, 2001a, 2001b). While the alleged distinctive characteristics of this cohort of people may be in question, the fact is that they were born and raised in the presence of digital technology. Other technology users, qualified by their age as Digital Immigrants (Prensky, 2001b), may be relative newcomers to the digitally-mediated lifestyle. Yet regardless of age, very few people today live wholly independently of networked technology, and there is a large subset of people who rely on being able to live a digitally-mediated existence. This generates a realm of communicative action and social integration that takes place in the interactive digital spaces of networked publics (boyd, 2008).

Networked publics are publics that are restructured by networked technologies. As such, they are simultaneously (a) the space constructed through networked technologies and (b) the imagined community that emerges as a result of the intersection of people, technology, and practice (boyd, 2008, p. 15). Networked publics are born of the enhanced multimodal communication capabilities afforded by networked technologies. Theories in social semiotics suggest that communication is always multimodal, implying that no sign or message ever exists in only a single mode such as language or writing (Kress, 1997, 2003). For example, much of the communicative power of a text comes not just from words, but from visual elements such as pictures and graphs, arrangement on the page, use of headings and subheadings, and styles and colors of

typography (Odell, 1995). Although the Internet originated primarily as a genre of linear text-based media, it has now moved far beyond that to encompass a complex universe of multi-media and multi-modal communicative transmission and meaning-making. This universe is inhabited by the citizens of the networked public.

For members of the networked public, the utility of the Internet as both a form and realm of communication is taken for granted, as is the use of the social media tools that enable the digitally-mediated interaction taking place there. In net-infused societies, communities are being created that are native to the new social software technologies. It follows that members of these communities may have difficulty fully comprehending, organizing, and interacting with their social and physical worlds without social media tools at their disposal. Accessing learners from these new communities requires a new form of education in which educators are challenged to create and sustain learning opportunities that leverage the learning affordances specific to the technologies upon which these communities are built (Anderson, 2008). Accordingly, to serve the networked public most effectively, learning delivery must be digitally-mediated in part or whole, and must be facilitated by social software tools. Among those tools, social network sites appear to be one of the most attractive options.

A model for the use of social network sites in teaching and learning.

Data collected during this research project supported the construction of a conceptual model for the use of social network sites in teaching and learning. That model developed around four primary component concepts:

Component concept 1: Educational web sites will be designed and deployed in a manner suitable to the habits and needs of the networked public.

Component concept 2: Educational social technology use must be a ubiquitous feature in future models of education delivery.

Component concept 3: We must reshape our conception, construction, and application of knowledge, teaching, and learning.

Component concept 4: Educational social technologies must be deployed within pedagogies emergent from and designed around the affordances of the technologies. These concepts are discussed in the following section.

Component concept 1: Educational web sites will be designed and deployed in a manner suitable to the habits and needs of the networked public. This is the foundational component concept regarding the use of social network sites in teaching and learning. Educational web sites have been in use by teachers and learners for years, most recently in the form of pages within large institutionally-hosted course management software (CMS) packages. Research from the EDUCAUSE 2009 Core Data Service revealed the prevalence of these systems, with more than 90% of responding institutions reporting the use of at least one commercial, homegrown, or open source course management system (Smith & Caruso, 2010). In the 2010 EDUCAUSE Center for Applied Research study of undergraduate students and information technology, 66% of students reported using course or learning management systems during the current semester, while only 20% of students were taking some or all of their courses entirely online (Smith & Caruso, 2010). The CMS is becoming a ubiquitous piece of technology present in all or nearly all courses at many institutions (Smith & Caruso, 2010) and, according to the spring 2009 Faculty Survey of Student Engagement, the CMS was the only technology being used extensively by faculty ("Professors' Use", 2010).

Teachers and learners are becoming accustomed to mediating the educational transaction through web sites, and these CMS are well suited to managing student enrolment, exams, assignments, course descriptions, lesson plans, messages, syllabi, and basic course materials. However, these systems were not developed for supporting self-governed and problem-based activities and do not easily support a social constructivist approach to digitally-mediated learning (Dalsgaard, 2006). They tend to be institution- and content-centric and lacking in support for the affordances that lead to the establishment of flattened communication networks and collaborative information flows (Dalsgaard, 2006; Siemens, 2004b). As data from this research project and others (Smith & Caruso, 2010) reveals, many instructors must look outside the bounds of institutionally-provided technology infrastructures and source the tools they want and need from the commercial Internet.

Educators are becoming increasingly familiar with social media software and social network technologies. Social network websites are already in wide teacher-to-teacher use as platforms for professional development, discussion, and information dissemination. In this role these "educational networks" (Hargadon, 2009) appear to offer numerous benefits. Along with enabling virtual meetings and conferences that are less resource-intensive to organize and attend than physical events, these networks may be used to

- enable positive peer support and provide encouragement,
- keep teacher practices up to date and promote job satisfaction,
- improve opportunities to find support for exploring new ideas,
- support mentoring practices,

- aid teacher retention and recruitment strategies, and

- offer a familiar environment to younger teachers, many of whom are already used to social networking (Hargadon, 2009).

Social software tools offer numerous affordances that are attractive to educators working in technology-enhanced environments. Transformed into ESS, these software tools can engage students in social networks centered around educational objectives, and facilitate personal, independent construction of learning (Dalsgaard, 2006). ESS can be used to address practical problems and tasks associated with the delivery of education and training. For example, building community, providing mentoring and personal learning assistance, working collaboratively on projects or problems, reducing communication errors, and supporting complex group functions are all possibilities within the affordances of ESS (Anderson, 2005a). ESS has the potential to empower entirely new conceptions of independence and collaboration in online education (Anderson, 2008).

To support new education paradigms, there is need for delivery systems that maximize learner independence and freedom while providing the capabilities for communication and collaboration required by constructivist pedagogies (Anderson, 2005a). The new CMS must have an ecological design (Siemens, 2003), presenting an organic, learner-centric, personal, and adaptable environment suitable to life-long learning, as in the personal learning environment concept (EDUCAUSE Learning Initiative, 2009). Becker & Henriksen (2006) suggest that, in order to leverage the power of social networking, the second-paradigm CMS should be founded on the following basic elements: (a) the ability for the individual learner to create a unique digital identity

on a personal profile page, (b) the ability to maintain a portfolio of work, and (c) the

ability to asynchronously engage in a self-directed learning experience. They further

recommend that the new online learning environment be built from the ground up with a

learner-centric perspective in mind (Becker & Henriksen, 2006). Such a learning

environment would represent a transformation of the CMS, or educational web site, into

educational social technology as per Anderson (2008).

To engage students in self-governed, problem-based, collaborative activities that

make active use of the Web itself as a resource, it is necessary to move beyond learning

management systems (Dalsgaard, 2006). Educational social technologies (EST) can

facilitate this move. As applied to an open learning educational context, a working

definition of EST is "networked tools that support and encourage learning through face-

to-face and online interactions while retaining individual control over the learners' time,

space, presence, activity and identity" (Anderson, 2008, p. 174).

Anderson (2008) draws on earlier work with educational social software

(Anderson, 2005) to point out qualities that effective educational social technology must

offer:

- Ease of use: Very easy to use, allowing individuals to communicate and
  participate in social activities with minimal technical skills.
- Accessibility: The contributions of others are not hidden behind passwords or
  closed classroom door, or archived in inaccessible libraries. Rather, social
  software is an integral component of a globally networked and publicly accessible
  information and communication infrastructure.

- Findability: Use of syndication, automatic and cooperative tagging, indexing and spider tools allows social software contributions and information about their authors to be searched, harvested, and extracted.

- Ownership and identity: Social relationships are built on reputation and responsibility. Social software seeks to return ownership or comments to their creator. Thus persistence of contribution across formal and informal communities and the technical capacity for all participants to link, search, and archive contributions across these communities is critical.

- Persistence: Being digital and thus searchable, social contributions (with permission of participants) can be used, referenced, researched, extracted, reused, and recycled. (p. 173-174)

These qualities are similar to those possessed by the social media and other tools that members of networked publics now use to interact with people and resources online, and manage their online lives in general. Educational web sites built along the above guidelines could be considered as having been designed in a manner that suits the habits and needs of the networked public.

As Anderson (2008) predicted, the builders of CMS systems are now including many social media-type tools in their software packages, and hybrid and customized combinations of social software are being used in conjunction with other online learning and teaching tools. As one survey respondent noted, "A full suite of ESS-type software and tools will eventually become an indispensable component of any course management system such as Blackboard." This would fulfill the parameters set by the foundational component of the proposed model of the use of social network sites in teaching and

learning.

Component concept 2: Educational social technology use must be a ubiquitous feature in future models of education delivery. This second component of the conceptual model for the use of social network sites in teaching and learning acknowledges the nature of effective technology use, which is to tend toward both ubiquity and invisibility. Technology use should be fully integrated in and necessary to purpose and context. In education, smart instructional design and ongoing practice will allow digital technology to be deployed smoothly and seamlessly, in a manner that embodies efficiency and individual convenience for students and instructors alike. Ultimately, the technology will fade into the background, invaluable yet invisible, taken for granted and useful rather than demanding, obtrusive, and of questionable utility in terms of effort/benefit trade-off (LeNoue & Stammen, 2011).

Note that most respondents in this study were not using networked digital technologies to deliver online distance education, but were instead conducting face-to-face (F2F) education with an element of digital mediation. This observation acknowledges the fact that the lines between different genres of instruction are becoming blurred. For instance, online technologies that may have been generally associated with distance education delivery are being deployed in 100% F2F delivery contexts. In many cases, teachers are using a CMS in F2F courses not because it is a desirable and effective delivery tool, but because the CMS is linked into institutional systems for enrolment, attendance, assessment, and communication, so such use is therefore mandated by the institution in service of administrative needs. This ubiquity of CMS systems often turns traditional F2F classes into blended delivery scenarios.

Blended learning (BL) is a term that has entered widespread use as a description of a particular form of teaching with technology. BL has risen in profile over the past three decades, yet remains unclearly defined (Oliver & Trigwell, 2005). A description that has gained some currency with the advance of digitally-mediated education refers to BL as including all learning environments in which F2F and digitally-mediated instructional modes are both in use (Graham, 2006; Graham, Allen, & Ure, 2005; Oliver & Trigwell, 2005). In efforts to enrich the learning experience, maximize efficiencies in the use of institutional resources, and enhance program marketability, many higher education institutions are expanding offerings of this type of course (Mossavar-Rahmani & Larson-Daugherty, 2007). Blended learning is also becoming the delivery method of choice in corporate and governmental training settings (Bonk et al., 2005).

By 2013, 40% or more of course offerings in higher education and corporate training are likely to be characterized by blended formats (Bonk et al., 2005). In higher education, blended offerings are expected to receive more emphasis than fully online courses, and it is possible that a majority of courses will soon have some online component (Kim & Bonk, 2006). In the K-12 context, over 4 million young students were participating in some kind of formal virtual learning program by 2010, and it is likely that over 29% of all US school children will be participating in some kind of online instruction by 2015 (Ambient Insight, 2011).

A future is visible in which schooling is dominated by delivery models that feature multiple instructional modes fluidly combined within the affordances of technology-enhanced delivery (Bonk, 2009; Kim & Bonk, 2006). Ways of learning will be shaped by (a) development in the realm of cloud computing, (b) creation in the area of

Web 2.0-type software tools and the programming languages associated with them, (c)

advances in wired and wireless networks and associated mobile technologies, and (d)

convergence and extension of the PLE and life-long learning paradigms. Digital

heutagogy (Hase & Kenyon 2000) as supported by the PLE concept will take precedence

as technological and social change drive ongoing transformation in the way people live

and work.

Digital mediation and the machines that enable it are becoming omnipresent and

completely transparent to generations born into the presence of networked digital

technology (Tapscott, 2009). When digitally-mediated delivery modes become part of

every educational experience (Bonk et al., 2005), blended and hybrid delivery will

disappear as concepts (LeNoue & Stammen, 2011; Smith & Caruso, 2010) and the

delivery technology will be invisible as well, its use in education no more worthy of note

than the use of a pencil is now. Given proper design, educational social network sites will

have ideal feature sets for the accomplishment of successful digitally-mediated education

delivery. Instances of ESS have the potential to be in universal service as the optimal

portal applications and PLE frameworks to serve teachers and learners at the interface

with online knowledge resources and content delivery tools.

Component concept 3: We must reshape our conception, construction, and

application of knowledge, teaching, and learning. The third component of the conceptual

model for using social network sites in teaching acknowledges the error inherent in

spending precious resources defending a failing paradigm (Kuhn, 1996). As Chris Dede,

a professor of learning technologies at Harvard University stated during an interview for

a Chronicle of Higher Education article, clinging to outdated teaching practices smacks

of educational malpractice:

> If you were going to see a doctor and the doctor said, 'I've been really busy since I got out of medical school, and so I'm going to treat you with the techniques I learned back then,' you'd be rightly incensed. Yet there are a lot of faculty who say with a straight face, 'I don't need to change my teaching', as if nothing has been learned about teaching since they had been prepared to do it-if they've ever been prepared to. (Young, 2010, para. 3)

Research findings suggest that many instructors continue to teach using old-school, lecture-based instruction despite numerous experiments with leading-edge teaching technologies on campuses around the country (Smith & Caruso, 2010). Although there is compelling evidence of the educational potential of various technologies, individual and institutional barriers to realization remain (Selwyn, 2010).

Researchers for the 2010 Faculty Survey of Student Engagement (FSSE) canvassed approximately 4,600 faculty members at 50 U.S. colleges in the spring of 2009 and found that overwhelming majorities of the instructors used very few technology tools of any type (Smith & Caruso, 2010). Course management systems were the only technology reported as being used extensively by faculty (Smith & Caruso, 2010). Correspondingly, fewer than half of the students surveyed felt that the technology use they experienced in their courses would adequately prepare them for the workplace; likewise, fewer than half reported that instructors used IT effectively in their courses (Smith & Caruso, 2010).

The contemporary "information age" is characterized by the diffusion of information and communications technologies and an increasing demand for content

delivery methods and educational approaches that foster lifelong learning (Fischer &
Konomi, 2005; McLoughlin & Lee, 2007). Social trends such as the diversification of life
trajectories, the need for multiple career paths and ongoing re-skilling, and the necessity
for flexibility in working hours are drivers of the need for learning on demand (Punie &
Cabrera, 2006). Digital modalities will rise to primacy in the effort to efficiently deliver
demand-driven learning (McLoughlin & Lee, 2007). The high digital connectivity and
need for life-long, demand-driven learning that characterize the modern world call for the
development of andragogies (Knowles, 1980) and pedagogies specialized to digitally
mediated environments.

In an online environment mediated by ESS, the effective instructor will operate
simultaneously as content expert and facilitator of both dialogue and change in learner
perspective (Guilar & Loring, 2008). Palloff and Pratt (2007) note that "In effective
online learning, the instructor acts as a facilitator, encouraging students to take charge of
their own learning process" (p. 125). Instructors should take on the role of guides, context
providers, and quality controllers while simultaneously helping students make their own
contributions to content and evaluations of the learning experience (Prensky, 2009). Such
methods must include learners as active participants or co-producers rather than passive
consumers of content, and frame learning as a participatory, social process intended to
support personal life goals and needs (McLoughlin & Lee, 2007; Tapscott & Williams,
2010). This model of learning should be comprised of (a) constructivist learning
approaches in which students engage in self-governed, problem-based work while
surrounded by tools and resources that support collaboration, construction, presentation,
and reflection (Dalsgaard, 2006); and (b) instructional designs that leverage the inherent

abilities of social software to encourage and facilitate multi-channel, flat-network interaction, and position students as contributors to the learning experience (Siemens, 2006b).

As communication technologies become ubiquitous and interoperable, the lines previously understood between formal and informal learning environments will increasingly blur (Rhodes, 2008). Individual learning contexts will be incorporated into flexible learning designs allowing for maximum control by the learner and integrating formal and informal learning environments (Sims & Stork, 2007). Instead of being restricted to interaction between members of the formal class, learners will have access to a myriad of resources, individuals, and learning objects that can be accessed as either primary or secondary learning aids (Rhodes, 2008).

> Google search and Wikipedia: the two most successful online learning tools ever created, I think. Everyone who has ever used them to learn has probably found innovative ways to learn as a result. In terms of impact, these two tools (and their ilk) are having a greater transformative effect on learning in universities and elsewhere than anything since the invention of the printing press. They are the tip of the wedge that will, eventually, completely transform formal education. (Dron, 2011, para. 5)

According to Siemens (2006a) and Saljo (2010), digital-age educators face challenges related to: (a) defining learning and the process of learning, (b) aligning curriculum and teaching with learning as well as with the higher level development needs of society, and (c) preparing the foundation for a transformative education model where technology is the enabler of new means of learning, thinking, and being. Technology is

changing society, and "much of the discussion about how to organize learning, how to reform schooling and how to produce competent citizens now takes place under the premises that the recent technologies have introduced" (Saljo, 2010, p. 55). Knowledge growth is exceeding our ability to cope with an overwhelming flood of information, necessitating the development of new theories of knowledge and learning that go beyond the development of vocational skills to the development of people who actively contribute to the quality of life in society (Siemens, 2006a).

New theories of learning must be built around the affordances of educational social technologies. As one research participant commented, "Educational Social Software provides 21st century tools for 21st century learners." ESS tools in combination with high speed networks have the potential to connect teachers, learners, and resources at scales and in ways never before possible. The networked learning phenomenon is still very new, and it is already breaking education wide open (Bonk, 2009). There is the genuine potential for world-changing transformation. Take for example The Khan Academy, a non-profit organization working toward the goal of changing education by providing access to a free world-class education to anyone anywhere. The Academy offers an online video library with over 2700 titles on a wide range of educational topics, along with practice exercises and assessments that can be accessed from any Internet-connected computer. In operation only since 2005, The Khan Academy advertises "over 91,151,381 lessons delivered". Wikiversity and Wikibooks are two more ground-breaking efforts that have already succeed in providing open access to massive inventories of educational resources, along with collaborative content creation opportunities on a global scale.

These are transformational projects of a type and scale never attempted before. Their descriptions serve here to illustrate the possibility and potential for transforming teaching and learning far beyond industrial-age vocational training models. This is necessary because, like The Kahn Academy or Wikiversity, the digitally-mediated global workplace will be driven by multimodal communication and distributed, collaborative value creation. Traditional hierarchical corporate structures will in many cases be flattened by factors such as extra-local geographic distribution of human and capital resources, new ways of distributing and managing work flow, and deracination of production processes (Friedman, 2005).

Participants who hope to be successful in the global work place must be fluent in the new styles of communication and collaboration, and literate in the use of the technologies that drive them. Independence, autonomy, and creativity will be valued as much as the ability to build and participate in effective working groups in F2F and distributed contexts. The ability to develop, maintain, and use widespread knowledge resource networks will be a highly valued, as will the ability to gather, sort, synthesize, and use information. All of these skills sets are of the type that can be learned and practiced via pedagogies afforded by the use of educational social technologies. As one respondent noted, these technologies facilitate "deep & sustained discussion, critical thinking, collaboration on projects, group critiques, authentic learning, development of learning products, innovation". These skills are valuable in many sectors of the modern occupational setting. Opportunities to teach and learn these technologies and master their associated skill sets should not be ignored or rejected. Rather they should be aggressively grasped by anyone interested in the development of new forms of teaching and learning

suitable to life in a post-industrial, post-global economy.

Component concept 4: Educational social technologies must be deployed within pedagogies emergent from and designed around the affordances of the technologies. This research project was initiated in the early days of the smart phone era. There were no i-Pads or smart TVs. The i-Pod touch was new. Streaming videos from Hulu and Netflix were just beginning to gain in popularity on pirated bit-torrents. Now, three years have gone, the excitement surrounding the dawning of the Web 2.0/social media age has passed, and transformational culture change has been wrought.

World events since the 2009 demonstrations in Iran have confirmed that what happened in Tehran marked the birth of new forms of communication and media culture. In the Iranian example, social media and the Internet enabled the emergence of a new type of citizen journalism that was richer in content, more immediate, vastly more accessible, and practiced on a larger scale than ever before possible (Afary & Anderson, 2009). This grass roots phenomenon then and since has proved to be readily able to mobilize millions of people and easily powerful enough to pose a credible threat to the forces of powerful states.

The support for multimodal communication and the establishment of various types of online presence that was afforded by social media in Iran and throughout the Arab spring are the same features that have made SNS-type online applications popular across a broad range of socio-cultural contexts for a multitude of purposes. The utility and ubiquity of this type of online tool is now firmly established, and the massive worldwide popularity of social network sites, along with the increased influence these sites have in professional and occupational contexts, assures that there will be a growing

presence of these sites in the fields of education and training. The initial experimental

stages have passed, ESS technology has been accepted as useful for many purposes in

educational contexts, and it is being used in education now. For example, the builders of

major course management systems such as Blackboard and Moodle have integrated

social media-type tools into these large institutional CMS platforms. The results from this

exploratory research project indicate that educational social software is a viable tool for

teaching and learning, and could be a driver of paradigmatic change in educational

domains, much as it was in the domains of journalism and revolution.

      Defining educational social network software.

      Social media use is now an established component of digitally-mediated

education delivery. There are many applications, and some of those are more like the

"classic" Facebook-style social network site than others.

> Some are generalized and multi-facetted application systems that combine social
>
> networking applications including blogs, wikis, profiles, resource tagging,
>
> documents sharing and other services. Conversely, there are specialized social
>
> networking applications focusing on particular applications such as language
>
> learning, meeting people who live near by or those who share common interest,
>
> hobbies or goals, scheduling and many other applications. (Anderson, 2009, para.
>
> 3).

As with the confusion over the definition of blended learning, the question is raised as to

what exactly comprises educational social network software as a bounded category?

(Bowker & Star, 1999; Lakoff, 1987; Star & Griesemer, 1989). Anderson (2005, 2008)

has outlined the functions and qualities an effective instance of educational social

technology should possess, but has not identified the specific defining aspects of an educational social network site. Neither have searches of the literature uncovered such an identification.

The definition for social network sites in general that boyd and Ellison (2007) offer is useful in its simplicity and clarity: web-based services that allow individuals to (a) construct a public or semi-public profile within a bounded system, (b) articulate a list (network) of other users with whom they share a connection, and (c) view and traverse their list of connections and those made by others within the system. This definition can serve to include software applications that power websites within the SNS category based on the presence of all three features (a), (b), and (c). A search of the literature has not revealed any similar definition for an educational social network site. I have previously proposed that the capacity to articulate, view, and traverse lists of connections may have little or no importance or utility as a feature of an educational social network site. Conversely, a personal profile space is an indispensable component of such a site.

There is a need to establish an ungraded cognitive model (Lakoff, 1987) for the concept of educational social network software. The growing presence of social network site-type software in the professional realm of education is creating a need to conveniently identify, refer to, and discuss these tools. The data collected in the present study exposed a strong theme of ambiguity concerning members of the categories "social network software" and "educational social software". This ambiguity necessitates the development of a conceptual model of the educational social network site. The model must be comprised of attributes flexible enough to adapt to local needs, yet stable enough to define category boundaries as per Star and Griesemer's (1989) description of abstract

boundary objects.

I will here put forward the following definition of educational social network software, and propose "learning network software" (LNS) as the associated identifying terminology. LNS will be defined as networkable software that offers users the ability to (a) create, maintain, and display a personal profile; (b) access a suite of multimodal communication and content publishing tools; (c) create and maintain a portfolio of artifacts and productions; and (d) access a searchable directory of other site users' profiles and productions. Based on my ongoing personal use of custom-designed Ning social network sites in educational contexts, extended formal research and investigation, and the resulting knowledge regarding key affordances (detailed previously in this report, eg. Anderson, 2005, 2008) that typical software of that type can and should offer teachers and learners, these four items appear to be the indispensable and definitive basic features of effective LNS.

Pedagogies designed around the affordances of educational social technology.

With learning network software so defined, and the features of same known, associated pedagogies may be discussed. The fourth component of the conceptual model for using education social network software and sites in teaching and learning is comprised of the proposition that educational social technologies must be deployed within pedagogies designed around the affordances of the technologies. Pedagogies and curricula specialized to deployment on the affordances of an LNS instance must be built around the affordances of the LNS, and should be built from ground up around those affordances. Heretofore, educational social media applications, or applications chosen to be used in education have essentially been new additions pasted on to existing

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educational technology frameworks, with corresponding modifications or add-ons

applied to existing pedagogies in the effort to leverage the affordances of the social media

application. Upon application of the conceptual model for the use of social network sites

in teaching and learning, the LNS as educational social media application would become

the core piece of educational technology infrastructure. In the same vein, the affordances

of LNS must be the core and driver of andragogical and pedagogical development and

design.

It is unnecessary to here delineate specific aspects of, and details about, LNS-

enabled pedagogies. Instead, a general conceptual model for pedagogies designed around

the affordances of educational social technologies will be presented and discussed in the

following section. The many potential features and affordances of social network

software and educational social software have been described and discussed at length

above. Moreover, LNS-enabled pedagogies will be nearly infinitely varied, and

individually designed according to the parameters and requirements of proposed

applications and contexts. Early adapters of presently available forms of LNS are

building pedagogies that leverage some of the capabilities commonly associated with

public varieties of SNS. Besides text-based communication tools, these capabilities

include profiles, contact lists, photo and graphic display capabilities, and synchronous as

well as asynchronous audio/video communication tools. At this early stage, approaches to

instruction are simply being adapted or developed to take into account the affordances of

whatever tools are available. As one respondent in this research project remarked,

> "While ESS holds much promise, it is necessary for the private sector to converse
>
> with the education sector and stabilize implementation, because a full suite of

ESS-type software and tools will eventually become an indispensable component

of any course management system such as Blackboard."

SWETE: A pedagogy for LNS.

Teachers need to be willing to embrace risk, to consider small ways of navigating

existing cultures and reframing old contexts to incorporate new ones. But it is not

down to teachers alone, parents, institutions and policy-makers also have a role to

play – in supporting teachers to take that risk. (Luckin et al., 2009, p. 103)

Anderson (2008) refers to social software technology as a new genre of distance

education software emerging from the intersection between earlier technologies that

generally support delivery and engagement with content, and new interactive

technologies that support multimodal human communication. As online education

delivery has developed, the emphasis has been on constructivist pedagogies that focus on

knowledge construction, critical thinking, problem-solving, collaboration, and

autonomous learning - all skills considered to be essential in a knowledge-based economy

(Bates, 2008). The constructivist model is comprised by the conception of learning as a

self-governed, problem-based, and collaborative process (Dalsgaard, 2006). This process

ideally takes place in open-ended learning environments that enable a student-centered

approach to digitally-mediated learning by

1. using a management system for administrative issues,

2. offering students personal tools for construction, presentation, reflection, and

collaboration;

3. facilitating networks between students within the same course; and

4. facilitating networks between students and other people working within the

field. (Dalsgaard, 2006, "Towards a Student-Centered Approach," para. 1)

Comprised of a suite of tools that can support learner choice and self-direction (McLoughlin & Lee, 2007), social software can be used to create an open-ended learning environment that provides multiple possibilities for activities, and surrounds the student with tools and resources that support the problem-solving process (Dalsgaard, 2006; Land & Hannafin, 1996). These attributes align well with the general precepts of a constructivist educational philosophy (Dalsgaard, 2006).

Working with the affordances of social software tools and within the second-wave e-learning paradigm, LeNoue & Stammen (2009, 2011) developed SWETE as a conceptual metaphor (Lakoff & Johnson, 1999) for use in talking about new forms of digitally-mediated learning. The acronym SWETE stands for "Second-Wave Enabled Technology-Enhanced", a category of digitally-mediated learning that is distinguished by the use of Web 2.0 social media tools (second-wave tools) and the communicative transactions they support to drive constructivist pedagogies, and by symbolic or practical de-centering of technology use in order to foreground sound teaching methodology as primary though enhanced by the use of technology. SWETE as a concept is intended to function as an ungraded cognitive model (Lakoff, 1987), and as a boundary object of the "ideal type" (Star & Griesemer, 1989) in that it does not describe the exact details of any particular mode or instance of pedagogy, but instead functions as a symbolic framework that enables communication and understanding regarding an emerging approach to education delivery.

Interactional properties of the SWETE model.

SWETE can serve as a stable prototype for the particular class of digitally

mediated pedagogies in which learning network sites are deployed. Prototype theory proposes that conceptual classifications can blur, causing the possibility that individuals may agree to categorize a number of things under the same label even though they have no binary features in common (Bowker & Star, 1999; Lakoff, 1987). When many such differing items are assigned to a category, that category will lose discriminatory power. The SWETE metaphor is positioned to counter this effect through framing within Lakoff's (1987) observation that:

> The properties that are relevant for the characterization of human categories are not objectively existing properties that are "out there" in the world. Rather they are "interactional properties," what *we* understand as properties by virtue of our interactive functioning in our environment. (p. 64)

This implies that particular and constant interactional properties may be observed at each application of the SWETE model. Following are the properties that will embody the general principles of SWETE pedagogy:

A. All instances of SWETE instruction will be framed within the acceptance of a permanent alteration of the power dynamic between students and teachers. In an operationalized SWETE model, the learning network site functions to dismantle traditional hierarchies associated with educational information delivery by placing all participants within a flat and multi-nodal interaction network and positioning them as co-participants in the learning process and co-creators of the instruction.

B. A constant aspect of SWETE pedagogies will be the use of second-wave (Web 2.0) networked technologies. These are social media read/write-type technologies that empower users to move beyond simple delivery and passive reception of course content

to collaborative interaction with and creation of content.

C. Within SWETE pedagogy, technology will always be positioned as beneficial to but not pre-eminent over pedagogy. The objective is enhancement of the teaching methodology, not the centering of technology use as an objective (unless technology use is the objective). Ideally, technology use will assume a characteristic of transparency within the teaching and learning process, becoming ubiquitous and easy to use to the degree that the technology itself becomes a negligible or invisible factor.

These fixed attributes can allow the SWETE model to serve as a category prototype for pedagogy while retaining enough plasticity (Star & Griesemer, 1989) to allow for adaptation to local needs. As a guideline model for pedagogy centered around particular approaches to digitally-mediated education, SWETE embodies flexibility while still representing a common identity and structure that will be recognizable across different contexts of application.

Components of the SWETE model.

Second-wave e-learning is the first of two component concepts that comprise the SWETE model. To support second-wave paradigms, there is need for delivery systems that maximize learner autonomy while providing the capabilities for communication and collaboration demanded by constructivist pedagogies (Anderson, 2005). A social network site or learning network site is the foundational component of a second-wave delivery system. Well-designed LNS can offer multi-modal and multi-media communication and content delivery capabilities and provide a virtual space where course participants can meet and take part in various formal and informal interactions centered on shared learning objectives. This social space can encourage the development of the object-

centered social structures (Engstrom, 2005) that arise naturally around the content, activities, and learning objectives that constitute commonalities shared by course participants.

It is the LNS tool that enables a second-wave pedagogical model comprised of (a) constructivist learning approaches in which students engage in self-governed, problem-based work while surrounded by tools and resources that support collaboration, construction, presentation, and reflection (Dalsgaard, 2006); and (b) instructional designs that leverage the inherent abilities of social software to encourage and facilitate multi-channel, flat-network interaction, and position students as contributors to the learning experience. Second-wave enabled pedagogies will engage diverse learning styles and encourage dense interaction and the constructive co-creation of learning experiences.

Detailed presentation of self and rich communication with others will be afforded by the availability of varied modes of expression. These may include choice in the design of personal pages or spaces, the ability to display digital photographs, art forms, slideshows, and graphics; the ability to play audio files; support for synchronous and asynchronous text-based chats and discussions, real-time screen sharing, and facilities for both live and online face-to-face meetings. Providing learners with a diverse toolset that empowers rich self-expression and authentic communication in a digitally-mediated environment is positioned as a primary objective within the SWETE model.

The second component of SWETE is the concept of technology as an enhancement to teaching and learning in the sense of being an added subtle improvement. The presence of technology is constant but de-centered, lending to movement through ubiquity toward invisibility. The goal is to deploy technology to support and intensify

sound pedagogy rather than in ways that allow tools and techniques to become the focus of the teaching/learning experience (Stammen & Schmidt, 2001). An array of technological media can be an ideal educational tool when correctly deployed within effective instructional designs, but it will never replace good teaching methodologies. Ground-up design of pedagogies around the affordances of the LNS and other technology tools ensures that tool use is positioned within pedagogy rather than being attached to the "outside" of an already extant design. Advances and refinements in hard- and software tools have made it easier to blend technology use smoothly into instructional methodologies. The presence of appropriate training and support resources is accepted as a given component of this approach.

In SWETE pedagogies, technology-enhanced social presence is afforded by the capacity, scalability, and multimodality of expression offered by sets of social media tools. These tools afford the establishment of authentic cognitive and emotional presence in virtual spaces, while the Web itself is used to expand these spaces into resource-rich and open-ended contexts for the application of social constructivist approaches to learning. In digitally-mediated education, good teaching means leveraging the growing set of available, inexpensive, and simple social media tools and applications that can be used to develop variations on the theme represented by the SWETE conceptual model. SWETE is an original and effective guiding conceptual model for the creation of pedagogies designed around the affordances of educational social technologies.

Research question 3 findings summary.

This research project produced data that could be used to construct a model for the use of Social Network Sites in teaching and learning. The model includes four

primary component concepts as listed below:

Component concept 1: Educational web sites will be designed and deployed in a manner suitable to the habits and needs of the networked public.

Component concept 2: Educational social technology use must be a ubiquitous feature in future models of education delivery.

Component concept 3: We must reshape our conception, construction, and application of knowledge, teaching, and learning.

Component concept 4: Educational social technologies must be deployed within pedagogies emergent from and designed around the affordances of the technologies. The SWETE model represents an example design for this concept.

Recommendations

The use of social network sites and social media in general for educational purposes is a brand new topic that should be explored further. As there are relatively few educational users of these sites at this point, a program to initiate well-regulated, broad, and longitudinal use of LNS in a variety of educational settings should be implemented to generate both practical experience and research data. There is an immediate need for more in-depth study of essentially any aspect of any instance of social network site use for teaching and learning, particularly large-n quantitative investigations of the benefits, issues, and outcomes associated with that use. Some recommendations for future study are as follows:

- Produce a meta-analysis of the many large government- and privately-sponsored studies now being produced around the topic of technology use in K-12 settings.

- Carry out a comprehensive analysis of the current overall situation regarding the use of digital learning environments in the K-12 context.

- Carry out a comprehensive analysis of the current overall situation regarding the use of social media tools in the K-12 context.

- Conduct a broad-scale, longitudinal trial of standardized LNS use at the secondary or higher education level followed by both qualitative and quantitative research focused on issues and outcomes.

- Conduct operational trials with a variety of LNS configurations in a range of instructional settings, to be followed by debriefing of the pilot testers and needs analysis focused on producing a sketch of required infrastructure and support systems.

Although there has been much research concerning the general use of public social network sites, substantive explorations of SNS use in educational contexts are only now beginning to appear. The field is still wide open, and nearly any topic or question related to the educational use of social network sites could be recommended for study.

Selwyn and Grant join many other authors on this subject in formulating a list of potential research interests around the use of SNS in education:

Many descriptive questions need to be asked of social software and learning. For instance, a range of pressing questions should be asked of what social software is actually being used for in education settings, as well young people's experiences and views of social software both within and beyond the walls of formal education. Basic questions of equality and diversity remain concerning who is doing what with social software, why and with what outcomes (as well as

correspondent questions of who is not doing things with social software). Similarly, questions can be asked of how the use of social software applications sits alongside pre-existing cultures and structures of schooling, the moral economies of households and the wider pressures of being a learner or a teacher in the early twenty-first century. Questions should also be raised about the ends as well as the means of social software use. For example, what learning can actually be said to result from the use of social software applications in education settings? What are the unintended and unexpected consequences of social software use – its seductions and pleasures as well as its problems and anxieties? Above all education researchers need to provide accounts of what can be really said to be 'new' about the educational use of social software – i.e., what is social software making possible that were not possible before; how are social relations being altered (if at all); can social software really be seen to constitute a new educational landscape, or does it more accurately describe a set of continuities from previous eras? (2009, p. 83)

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APPENDIX A. INSTITUTIONAL REVIEW BOARD EXEMPTION

NDSU   NORTH DAKOTA STATE UNIVERSITY

701.231.8995
Fax 701.231.8098

Institutional Review Board

Office of the Vice President for Research, Creative Activities and Technology Transfer
NDSU Dept. 4000
1735 NDSU Research Park Drive
Research 1, P.O. Box 6050
Fargo, ND 58108-6050

Federalwide Assurance #FWA00002439
Expires April 24, 2011

Thursday, June 03, 2010

Dr. Ronald Stammen
School of Education
FLC

Re: IRB Certification of Human Research Project:

"Educational Social Software: The Use of Social Network Software for Teaching and Learning"
Protocol #HE10291

Co-investigator(s) and research team: **Marvin LeNoue**

Study site(s): **varied/online**   Funding: **n/a**

It has been determined that this human subjects research project qualifies for exempt status (category # 2, 4) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, *Protection of Human Subjects*). This determination is based on the protocol form received 5/26/2010 and consent/information sheet received 5/26/2010.

Please also note the following:

- This determination of exemption expires 3 years from this date. If you wish to continue the research after 6/2/2013, the IRB must re-certify the protocol prior to this date.
- The project must be conducted as described in the approved protocol. If you wish to make changes, pre-approval is to be obtained from the IRB, unless the changes are necessary to eliminate an apparent immediate hazard to subjects. A *Protocol Amendment Request Form* is available on the IRB website.
- Prompt, written notification must be made to the IRB of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
- Any significant new findings that may affect the risks and benefits to participation will be reported in writing to the participants and the IRB.
- Research records may be subject to a random or directed audit at any time to verify compliance with IRB policies.

Thank you for complying with NDSU IRB procedures; best wishes for success with your project.

Sincerely,

Kristy Shirley

Kristy Shirley, CIP
Research Compliance Administrator

APPENDIX B. CALL FOR RESPONDENTS LETTERS

First Call for Respondents 8/8/10

Call for Respondents: Large-Scale Research Project on the Educational use of Social

Network Websites (survey link: https://tt1.opinio.net/s?s=9393)

Educational Social Software: The Use of Social Network Software for Teaching and

Learning

Dear Educator:

My name is Marvin LeNoue. I am a doctoral candidate in Occupational and Adult

Education in the Department of Human Development and Education at North Dakota

State University. For my dissertation research, I am conducting a study to gather

information on educators' use of social network websites as educational content delivery

tools and as part of educational activities.

The goal of the study is to create a conceptual map modeling the use of social

network software in support of constructivist learning approaches. It is my hope that this

research will help education professionals learn more about the ways in which social

network software can be used as a tool for teaching and learning.

I would like to invite you to take part in this research project because you are an

educator who is interested in the use of social media and Web 2.0 tools in teaching and

learning. Your participation is entirely voluntary, and will consist of completing a brief

online survey.

No personally identifying information will be collected as part of the survey, and

no online or digital identifiers such as URLs or IP addresses will be recorded. The survey

is absolutely anonymous. No one, including the researcher(s) will know that the

information you give comes from you.

By taking part in this research, you will contribute to an important new area of knowledge regarding the use of instructional technology. The field of education and training as a whole will gain from the information generated by this research project. Instructors and administrators may benefit from a reduction in misperceptions regarding social network software and its place in educational contexts, and companies that build learning management software may receive input from this research that will guide them in the production of new tools that will aid educators in their day-to-day work and enhance the learning experience.

It should take about 10 minutes to complete the survey, which includes questions about the educational setting you work in and your use of social network software. By completing the survey, you give me permission to possess and use any data generated, and publish in whole or part both the data, and reports and articles derived from analysis of the data.

If you have any questions about this project, please call me at 701-412-1122, email m.lenoue@ndsu.edu, or call my advisor Dr. Ronald Stammen at 701-231-7210, email Ronald.Stammen@ndsu.edu

If you have questions about your rights as a research participant or complaints about this research, you may contact the NDSU Human Research Protection Program at 701-231-8908, ndsu.irb@ndsu.edu, or by mail at: NDSU HRPP Office, NDSU Dept 4000, PO Box 6050, Fargo, ND 58108-6050.

Thank you for taking part in this research. Watch for publication of the results online at LearnCentral.org and other venues hosting communities of educators interested

in the use of social media in teaching and learning.

Final Call for Respondents 10/12/10

Final Call for Respondents: Educational Social Software: The Use of Social Network Sites for Teaching and Learning (survey link: https://tt1.opinio.net/s?s=9393)

The survey data collection phase of this research project will close on Friday, October 29th, 2010. Please take this opportunity to join respondents from around the world (8 countries and counting!) in expressing your thoughts regarding the use of social network-type software tools in the delivery of education and training.

This URL (https://tt1.opinio.net/s?s=9393) links to a dissertation research survey that is part of a project being conducted by Marvin LeNoue, doctoral candidate in the North Dakota State University College of Human Development and Education. The survey instrument was developed with guiding input from experts in the field of technology-enhanced instruction. This is an anonymous, web-wide study intended to provide insight into a paradigm shift that is occurring in the realm of digitally-mediated education delivery as more and more educators deploy social media tools in support of online, blended, and face-to-face instructional approaches. Your input will be a valuable addition to the project, and will help shape the development of future generations of course-management tools.

This project has been approved by the NDSU Institutional Review Board, and is being conducted under the advisement of Dr. Ronald Stammen, Principal Investigator and NDSU Professor Emeritus.

Please take advantage of this opportunity to express your viewpoint on what is sure to be one of the most important and influential trends in education since the

introduction of computer technology to the classroom. Click

https://tt1.opinio.net:443/s?s=9393 or copy and past into a browser navigation bar to

complete the survey.

      If you would like more information, or have any questions or comments, please

contact me at m.lenoue@ndsu.edu. If you have questions about your rights as a research

participant or complaints about this research, you may contact the NDSU Human

Research Protection Program at 701-231-8908, ndsu.irb@ndsu.edu, or by mail at: NDSU

HRPP Office, NDSU Dept 4000, PO Box 6050, Fargo, ND 58108-6050.

APPENDIX C. SURVEY DATA COLLECTION INSTRUMENT

Welcome Message

Welcome, and thank you for your participation in this research project. This survey instrument is an important part of the data gathering process for "Educational Social Software: The Use of Social Network Sites for Teaching and Learning", a dissertation research project being conducted by Marvin LeNoue, doctoral candidate in the North Dakota State University College of Human Development and Education. This project has been approved by the NDSU Institutional Review Board (http://www.ndsu.nodak.edu/research/irb/rcatt_irb_contacts.html), and is being conducted under the advisement of Dr. Ronald Stammen, Principal Investigator.

This study is intended to provide insight into a paradigm shift that is occurring in the realm of digitally-mediated education delivery as more and more educators deploy social media tools in support of online, blended, and face-to-face instructional approaches. This is the first large-scale research study focused on the instructional use of social network software, and your input will be a valuable addition to the project. Please take advantage of this opportunity to express your viewpoint on what is sure to be one of the most important and influential trends in education since the introduction of computer technology to the classroom.

If you would like more information, or have any questions or comments, please contact me at m.lenoue@ndsu.edu. Research participants or other interested parties may also contact the North Dakota State University Institutional Review Board for information on this research project: North Dakota State University Sponsored Programs Administration, 1735 NDSU Research Park Drive, NDSU Dept. #4000, PO Box 6050,

Fargo, ND 58108-6050. (NDSU.IRB@ndsu.edu; 701.231.8995)

Thanks again,

Marvin LeNoue

Note 1: For the purpose of this study, I will draw on the work of Anderson (2006), boyd (2007), boyd and Ellison (2007), Dalsgaard & Paulsen (2009), and Garrison & Anderson (2003), to define educational social software (ESS) as: technology that affords the establishment of individual virtual personal spaces, or profile pages, by users, while at the same time providing access to personal and shared suites of typical social media tools. Note 2: This survey is designed to gather your perceptions regarding (a) the use of educational social software as part of education delivery at the program, course, and classroom levels and (b) the potential of this technology to engender paradigmatic change in educational domains.

Please read the questions carefully and answer them as appropriate. This study has been approved by the North Dakota State University Institutional Review Board (NDSU.IRB@ndsu.edu; 701.231.8995). Thank you for your participation.

Section 1: Demographic Questions

1. Which age group do you belong to?

<20

21-30

31-40

41-50

51-60

>60

2. Country of Current Residence [Drop-down Country List]

3. Occupational Category

- Education (PreK-12 or Higher Education)

- Occupational Training (Business, Government, Industry/Manufacturing, Medical, Military, Other [Fill-in])

4. If you work in education, identify the level(s). Choose all that apply. Otherwise, choose NA.

Pre-K, Kindergarten, Grades 1-5, Grades 6-8, Grades 9-12, Baccalaureate, Graduate, Doctoral, NA

5. If you work in education, identify the subject area/discipline in which you work. Otherwise, choose NA.

Arts/Humanities, Social Sciences, Mathematics, Physical or Life Science, Computer Science, Career/Technical Education, Other [Fill-in], NA

6. If you work in Occupational Training, identify the category. Otherwise, choose NA.

Business, Consulting, Government, Industry/Manufacturing, Medical, Military, Service, Other [Fill-in], NA

7. Do you work as: An instructor, An administrator, Both

8. I use technology in the delivery of courses through the following formats [Choose all that apply].

Fully Online Education, Hybrid or Blended Learning, Face-to-Face Instruction, Other [Fill-in]

Section 2: Educational Social Software (ESS) Use

9. How long have you been using Educational Social Software (ESS) in your

instructional activities? < 1 year, < 2 years, < 3 years, More than 3 years

10. Keeping in mind the definition of educational social software presented in note 1 above, identify the foundational educational ESS tool(s) you use as part of your professional practice. (i.e. Ning, Facebook, ELGG, Social Media Classroom etc.) [Fill-In Answer]

11. Identify your general purpose for using ESS in the delivery of education and training.

1. Primarily for communication and community-building, 2. Primarily for content delivery and assignment completion, 3. Both are equally important

12. In your own words, identify your specific purpose(s) for using ESS in the delivery of education and training. [Fill-in]

13. Rate the importance of the following ESS features to your education and/or training delivery activities.

1 = not important to 5 = very important.

Personal learning environments/spaces 1 2 3 4 5

Public profile spaces 1 2 3 4 5

Privacy controls 1 2 3 4 5

Connection to networks of peers 1 2 3 4 5

Connection to networks of experts 1 2 3 4 5

Discussion boards 1 2 3 4 5

Commenting 1 2 3 4 5

Blogs 1 2 3 4 5

Microblogs/updates 1 3 3 4 5

Link sharing 1 2 3 4 5

Synchronous chat 1 2 3 4 5

Audio/video play capability 1 2 3 4 5

Audio/video upload capability 1 2 3 4 5

Synchronous audio/video conferencing 1 2 3 4 5

Photo storage and display 1 2 3 4 5

Customizable graphics/colors 1 2 3 4 5

External feeds/RSS capability 1 2 3 4 5

Shared calendars/scheduling 1 2 3 4 5

Trackbacks 1 2 3 4 5

Other [Fill-in] 1 2 3 4 5

14. How important to your instructional practice are ESS capabilities to enable the

development and support of learning communities?

1 = not important to 5 = very important. 1 2 3 4 5

15. In your experience, which ESS feature(s) best enable the development and support of

learning communities? [Fill-in]

16. How important to your instructional practice are ESS capabilities to enable the

development and support of social presence in online environments. (Social presence =

the ability of participants to project themselves socially and emotionally through the

medium of communication being used. As per Garrison & Anderson, 2003.)

1 = not important to 5 = very important. 1 2 3 4 5

17. In your experience, which ESS feature(s) best enable the development and support of

social presence in online environments? [Fill-in]

18. How important to your instructional practice are ESS capabilities to enable the

development and support of transparent learning environments in which students have awareness of and access to the products generated by other students in the process of engaging with course materials and activities.

1 = not important to 5 = very important. 1 2 3 4 5

19. In your experience, which ESS feature(s) best enable the development and support of transparent learning environments? [Fill-in]

20. How important to your instructional practice are ESS capabilities to support content creation by all users/course participants.

1 = not important to 5 = very important. 1 2 3 4 5

21. In your experience, which ESS feature(s) best support content creation by all users/course participants? [Fill-in]

22. Indicate your agreement with the following statement: "Educational social software is a viable tool for teaching and learning." 1. Strongly Disagree, 2. Disagree, 3. Neutral, 4. Agree, 5. Strongly Agree

23. Indicate your agreement with the following statement: "Educational social software is a tool that can lead to the development of new models of education and training that are centered on students as the creators of individual life-long learning processes rather than on institutions and teachers as controllers of educational processes and dispensers of knowledge." 1. Strongly Disagree, 2. Disagree, 3. Neutral, 4. Agree, 5. Strongly Agree

24. Indicate your agreement with the following statement: "ESS use is a fad that will have no lasting impact on educational practices." 1. Strongly Disagree, 2. Disagree, 3. Neutral, 4. Agree, 5. Strongly Agree

25. Indicate your agreement with the following statement: "ESS use takes up time that

could be better spent on other learning activities." 1. Strongly Disagree, 2. Disagree, 3. Neutral, 4. Agree, 5. Strongly Agree

26. Reflection: Identify challenges associated with implementing ESS capacities within your occupational setting. [Fill-in]

27. Reflection: Identify institutional barriers to the implementation of ESS capacities within your occupational setting. [Fill-in]

28. Microblog-style Open-ended Question: In 150 characters or less, summarize your thinking in regards to Educational Social Software. [Fill-in]

A Neural Network Framework for Qualitative Data Analysis