SOCIAL NETWORKING: INDICATORS THAT CONNECT INSTRUCTION AND LEARNING IN ONLINE COURSES

by

Gloria J. Nobles

SONJA A. IRLBECK, EdD, Faculty Mentor and Chair

EDWARD MAYBERRY, PhD, Committee Member

MARKUS GEISSLER, PhD, Committee Member

Barbara Butts Williams, PhD, Dean, School of Education

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Abstract

Social networking has experienced rapid growth in educational environments in recent years yet limited documentation is available on ways that experienced course designers have used to integrate social networking applications. Using a mixed methods Delphi approach, this study investigated the use of social networking applications in online community college courses. Data gathered from this study documented ways which a 15-member expert panel of course designers in higher education have used to integrate social networking applications into online college courses and indicators the panel used to confirm that learning had occurred due to the integration. This study was accomplished through the use of three iterations of surveys. The first survey was open-ended and the second and third surveys used a Likert-type rating scale to solicit panel opinions. The following themes emerged from the open-ended survey related to ways the expert panel used social networking applications: (a) communication, (b) experimentation, (c) design and implementation, (d) interacting, (e) feedback and participation, and (f) extending knowledge. The following themes emerged from the open-ended survey related to indicators of learning the panel identified: (a) degree of relevance and interest, (b) participation, (c) performing research, and (d) employment. Seventy unique statements were categorized under these themes and used in the second and third surveys to illicit panelists’ opinions. The expert panel reached agreement on 61 out of the 70 unique statements by the end of the study. At a time when many educational professionals are feeling pressured to use technology in course designs, research that investigates the wise uses of social networking applications becomes increasingly important. The findings can also be helpful to those concerned with the disparity between today’s learner using social
networking applications daily as a central part of their personal lives to communicate, collaborate, and learn yet not in academic environments. Data gathered during this study may provide those who are interested in using social networking applications in course designs with ideas based on strategies identified by instructional designers and designers-by-assignment with experience using social networking applications to prepare today’s learner with the skills needed in the information age.
Dedication

To my loving sister, Tenner, who always knew just the right time to be a sister, a friend, or a mom, depending on what I needed throughout this journey. To my loving sister, Mary, who always had an encouraging and inspiring word to share.

To my nephew, Raymond, who never ceased in reminding me that he was always available to do anything—proofread, critique, brainstorm—or just call to check on me and remind me to lighten up, take a break, and return with a fresh mind.

To my daughter, Janae, who can now officially refer to me as Dr. Mom and my mom, Lula B., for her constant inspiration and love.

In memory of my father, Willie, Sr., and my brothers, Willie, Jr., and Howard, who all passed away during my journey—this one is for you! I am saddened that you are not physically here at this time but so grateful you were with me for part of the journey and that your love has carried me through until the end.

As we have always said, we simply wish everyone had a family like ours. I am blessed to have family members that are too numerous to mention here who truly know how to show love.
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CHAPTER 1. INTRODUCTION

Introduction to the Problem

Social networking using Internet-based social networking applications has experienced rapid growth in recent years. Social networking as a method of communicating provides opportunities for users to connect locally and globally to collaborate and create and share information. The use of these applications can provide a sense of connectedness to other learners and to the instructor that is sometimes lacking in online educational environments (Siemens & Tittenberger, 2009). Social networking applications are often a part of daily activities of college students who use them as central parts of their social and academic lives.

Many educators and instructional designers have observed a disparity between students’ use of networking applications in their daily interactions and the lack of using them in educational environments to make connections for learning (Loughlin & Lee, 2008). This disparity has prompted an increase in incorporating social networking applications into instructional designs in an effort to build connections and enhance learning using applications familiar to many of today’s learners (Anderson, 2009).

Anderson, Research Chair in Distance Education at Athabasca University, in an effort to “harness the power of social software” (Anderson, 2009, para. 2), created an open-source learning environment that enables learners to do many things they would do on campus. This learning environment allows students to find study buddies, post hints,
and other helpful content, discuss projects, and work on group assignments using social networking applications familiar to them. Learners are afforded opportunities to socially engage to support one other, collaborate, and use media to gather needed information, which engages them and uses skills that many companies expect from employees (Anderson, 2009).

A review of literature revealed several studies (Johnson, 2010; Jones & Fox, 2009; Pew Internet and American Life Project, n.d.; Smith, Salaway, & Caruso, 2009) related to the overall growth in social networking and to increased use of social networking based on the age of the user. While studies indicated an overall growth in social networking use, information is still needed that specifically addresses how social networking has been integrated into the design of instruction in community colleges and the strategies and techniques used in this integration that connect instruction and learning.

**Background of the Study**

The typical structure of today’s educational systems resembles systems used in the industrial age when standardization and compliance were common requirements. With the evolution of the information age (also referred to as the digital age), knowledge work has replaced manual labor as the predominant form of work, and societal systems tend to be much more complex. The educational needs of the information age are dramatically different than those in the industrial age and require measures that transform the educational system into one that addresses these new learning needs. The information age is characterized by a period of increased global access to information and a rapid rate at which technology changes. Today’s learners need skills that allow them to respond to
challenges presented by this rapid rate of change that may involve individual problem solving or collaborative efforts. Learning experiences must include activities that foster the development of self-directed learners who know how to learn and are able to access relevant, current information by using available technology and resources. This age presents a greater need for lifelong, self-directed learning that includes problem solving and collaboration skills (Reigeluth & Carr-Chellman, 2009).

Siemens and Tittenberger (2009) suggest that in order for educational systems to meet growing challenges, emerging technologies (i.e., social networking applications) should be incorporated into designs of instruction as bridging processes to connect learners and expand options for interaction. Siemens (as cited in Loughlin & Lee, 2008, p. 14) stresses that making and maintaining connections is a skill that is essential for lifelong learning in a knowledge-based, networked society.

Brown (2000) describes the need for the creation of a “new kind of information fabric in which learning, working, and playing co-mingle” (p. 12). Brown challenges those in educational environments to question how this can be integrated into a new concept of “learning ecology” (p. 18). Brown suggests that education is in the middle of a “shift between using technology to support the individual to using technology to support relationships between individuals,” and this shift will influence a greater use of Internet-based applications and the discovery of new applications to facilitate collaboration and lifelong learning.

In the 2006 U.S. Department of Education report, Charting the Future of U.S. Higher Education, institutions were urged “to develop new pedagogies, curricula and technologies to improve learning” while developing “a national strategy for lifelong
learning designed to keep citizens of the United States at the forefront of the knowledge revolution” (p. 5) for the information age. To achieve these goals, the report urged colleges to test new teaching methods, content delivery, and innovative pedagogy using technology-based, learner-centered, collaborative applications. Although technology has played a role in teaching and learning processes for many years, the role of technology is becoming central to designs of effective instructional activities and learning environments for this era and beyond (Reigeluth & Carr-Chellman, 2009).

**Statement of the Problem**

While social networking applications are being incorporated into instructional designs in an effort to build connections and enhance learning environments, minimal information can be found on how social networking is being used to effectively connect instruction and learning. Literature is also limited about how social networking is incorporated into the design of instruction, and strategies used to enhance learning processes with social networking. Much of the research conducted and published internationally on using social networking focuses on the connection between the generations of learners (e.g., Baby Boomers, Generation X, Generation Y, and Millennials) and how different generations use social networking applications. Reports about these connections vary and are investigated in more detail in Chapter 2. Researchers have not yet thoroughly investigated the use of social networking for improving instruction and learning in online classes at the community college level. This research sought data to help address this investigative void.
Purpose of the Study

The purpose of this study was to examine how social networking is being integrated into designs of instruction to connect instruction and learning as identified by instructional designers and “designers-by-assignment” (Merrill & Wilson, 2007, p. 336; as defined later in this chapter) of online courses at the community college level. This study investigated wise uses of social networking applications in education.

The word Wise (n.d.) is defined as characterized by wisdom, informed, marked by deep understanding. A review of literature revealed what noted learning theorists and leaders in the field of education have cited as requirements for today’s learner that may be satisfied through a focus on using technology (i.e., social networking) wisely.

Following is a sample. For additional information, see Chapter 2, Literature Review.

- Reigeluth and Carr-Chellman (2009) stressed that learning experiences must include activities that foster the development of self-directed lifelong learners with problem solving and collaboration skills, able to access relevant, current information by using technology that allows global access to resources.

- Siemens and Tittenberger (2009) stressed that emerging technologies (i.e., social networking applications) should be incorporated into designs of instruction as bridging processes to connect today’s learners and expand options for interaction.

- Brown and Adler (2008) encouraged the use of Internet-based technology to connect learners with established practitioners in specific fields to allow learners to master a field of knowledge by participating in the field. The authors described this process as “learning to be” while “learning about.” This interaction would allow global access to a vast number of current participatory educational resources via social networking sites, blogs, wikis, and virtual communities.

Brown (2000) suggested that education is in the middle of a “shift between using technology to support the individual to using technology to support relationships between individuals” (p. 18), and this shift should influence a greater use of Internet-based applications and the discovery of new applications to facilitate collaboration and lifelong learning.

For the purpose of this study, wise use is defined as informed use of social networking applications that focus on what today’s learner needs in order to be a self-directed, lifelong learner with problem solving and collaboration skills, able to access relevant, current information using technology that allows global access to resources.

**Rationale**

Many recent studies indicate that social networking use has increased in personal, professional, and educational environments with limited examples of strategies used to promote these activities, specifically in educational settings. Instructional designers can benefit by learning whether and which strategies may be beneficial based on experiences of educators and instructional designers who have used social networking applications in ways that improve instruction and learning.

Many learning theorists agree that technology often provides opportunities to create engaging learning experiences but can also present challenges that do not contribute to student learning (Cohen, 2009). Those responsible for providing educational resources are often “distracted by using technology for the sake of using technology instead of focusing on what actually improves the effectiveness of learning” (Cohen, 2009, p. 15). Many professionals feel pressured to use technology when it is “inevitably proven that it is the wise use of technology that succeeds, not the technology itself” (Israelite, 2009, p. 1). The wise use of technology includes a focus not only on the
effectiveness of learning specific subject matter content but a focus on preparing today’s learners for the information age. As the use of social networking continues to increase globally, research that investigates wise uses of social networking applications becomes increasingly important.

**Research Questions**

The following research questions were developed to determine what instructional design strategies are being used to connect instruction and learning using social networking in online college courses.

1. How are instructional designers and designers-by-assignment incorporating social networking into the design of courses at the community college level?

2. What indicators do instructional designers and designers-by-assignment use as evidence of learning when social networking activities are integrated in online community college level courses?

**Significance of the Study**

This study is important to the field of instructional design because it explored the use of emerging technology applications that may be beneficial in addressing skills needed in education (e.g., collaboration, communication, and lifelong learning) identified in recent reports about changes required in the digital age. The study also explored a learning theory (connectivism) that encourages the development of effective collaborative e-learning activities using social media and provides nine principles to be considered by designers of instruction.

The data gathered from this study helped document ways in which social networking is being incorporated into designs of instruction and identified successful
strategies used in college level online courses which in turn should extend the current body of research. This knowledge may assist instructional designers in designing instruction that provides learners with skills needed in the digital age.

**Definition of Terms**

*AACE:* Acronym for Association for the Advancement of Computing in Education.

*AECT:* Acronym for Association for Educational Communication and Technology.

*ASTD.* Acronym for American Society for Training and Development.

*Blog (also called Weblog).* A personal website that provides updated headlines, journal entries, news articles and commentaries by a user. A blog may contain technical issues and discussions and links to other related sites or blogs.

*Connectivism.* An emerging learning theory based on the view that knowledge and cognition are distributed across networks of people and technology, and learning is a process of connecting, growing, and navigating those networks (Siemens & Tittenberger, 2009).

*Designer-by-Assignment.* An educator or subject-matter expert (SME) who serves as both instructional designer and instructor (Merrill & Wilson, 2007). This phrase is attributed to instructional design expert, M. David Merrill, who coined the phrase to identify subject-matter experts (SMEs) who find themselves in roles in which they must develop learning content. These designers-by-assignment did not seek out the role; it is usually an outgrowth of their primary job responsibility and subject matter expertise.
Digital Divide. Differences between people who have access to (or are willing to use) new technologies and those who do not (or are not; Rothwell, 2008).

Digital Immigrant. A person who grew up without digital technology (e.g., computers, Internet, mobile phones, mp3 players) but adopted it later (Prensky, 2001a).

Digital Native. A person who was born when digital technologies (e.g., computers, Internet, mobile phones, mp3 players) already existed. Digital natives grew up using technology (Prensky, 2001a).

e-Portfolio. A digital collection of work archived on a website or on electronic media assembled by individuals to demonstrate their competence, accomplishments, and knowledge level (Lorenzo & Ittelson, 2005).

Emerging technology (for learning). Developing technologies that consist of hardware, software and concepts that allow learners to connect, collaborate and create with other learners. These technologies are considered to be capable of substantially altering social environments. They include information technology and data communication and may refer to both existing and proposed technology (Siemens, 2008a).

ICT. An acronym for Information and Communication Technologies. The general purpose of ICT in education is to familiarize students with computers. ICT is often used to refer to all technical means for processing and communicating information.

ISTE. Acronym for International Society for Technology in Education.

LinkedIn®. A world-wide social networking service or online community that provides registered users with business-oriented networking.
**Neuroplasticity.** Refers to the capacity of neurons and neural networks in the brain to change their connections and behavior in response to new information, sensory stimulation, development, damage, or dysfunction (“Neuroplasticity,” 2011).

**Podcast.** A web-based set of digital media files (audio or video) accessed by subscription over the Internet.

**Prosumers.** A recently coined term that describes today’s learners who both participate in the learning process and create content (i.e., both consumers and producers) using participatory and collaborative technology (Loughlin & Lee, 2008).

**RSS (Really Simple Syndication).** The digital file format suitable for disseminating real-time information via subscription on the Internet. When content is stored in this format and sent to others via the Internet, it is called an RSS feed. Many social media sites (e.g., Twitter®, Facebook®, and MySpace®) use RSS feeds to distribute their content.

**Social Networking.** The process of connecting, communicating, collaborating, and sharing information mainly online with others who may share similar interests and activities. The Internet enables the creation of social networks through web-based connections.

**Social Networking Software (SNS).** Internet-based applications designed to connect people who share personal or professional interests to interact and share data. Examples of popular social networking software include Twitter®, Facebook®, MySpace®, and LinkedIn®. Social networking software is also referred to as social networking applications.
Status Update Service. A social networking service that allows users to share short updates about themselves, their whereabouts and other comments, or to see updates posted by others online. An example of a status update service is Twitter® (Pew Internet and American Life Project, n.d.).

Twitter®. A microblogging social networking service that allows users to send and receive short messages (140 characters or less) called tweets to a sender’s subscribers, known as followers. This social networking service is also referred to as a status update service.

Wiki. A set of linked web pages that can be edited by multiple users (Wagner, 2004). Users can easily create and edit interlinked web pages used for collaboration.

Wise Use. For the purpose of this study, wise use is defined as informed use of social networking applications that focus on what today’s learner needs in order to be a self-directed, lifelong learner with problem solving and collaboration skills, able to access relevant, current information using technology that allows global access to resources.

Assumptions and Limitations

This study was based on the assumption that designers-by-assignment who teach college online courses have incorporated some type of social networking into designs of instruction without a clear sense of how the design strategies used in the courses influence learning. The study focused on social networking in fully online classes and did not gather data on courses using other methods of delivery (e.g., hybrid, face-to-face) although those alternate methods may also represent a large student population of social network users.
Participation by educational professionals was voluntary and the total number of participants may not represent a majority of online courses offered at community colleges. Because the study was launched during the first week of the semester which is often a busy time and the survey instruments were available for a defined number of weeks, response time may have been affected. Scheduling time to participate in the study may have presented a challenge to those panelists responsible for classes offered in a variety of timeframes (5-week, 6-week, 8-week, full semester) and formats at the colleges where panelists were employed.

Due to the iterative process inherent in the use of the Delphi process (the process determined to be best for this study), there is a potential for low response rates (Witkin & Altschuld, 1995). Because respondents to one round are asked to respond to questions and comments in subsequent rounds and are encouraged to reassess their own comments in subsequent rounds, if they choose to discontinue their participation before the rounds are complete, the “quality of information obtained could be discounted or at least critically scrutinized” (Hsu & Sandford, 2007, p. 5). Due to open-ended questions contained in the first round questionnaire, the Delphi process may be considerably more time-intensive for the respondents than traditional surveys (Okoli & Pawlowski, 2004). Although the initial time-intensive questionnaire may discourage participation, it was hoped that the opportunity to learn through consensus building would be an incentive for participation.
Nature of the Study

This study used a Delphi approach of successive examination of information and opinions from experts in the field of instructional design. The goal was to examine how social networking is being integrated into designs of instruction in community college online courses to connect instruction and learning. The panel of experts chosen for this Delphi process consisted of instructional designers and designers-by-assignment who have at least five years of instructional design experience with at least a bachelor’s degree and two years of experience in course design using social networking applications in higher education environments.

Methodology

Electronic questionnaires were used to gather data using the Delphi approach and were distributed through SurveyMonkey®. Participants were contacted via an e-mail request to participate and were provided a link to the consent form and questionnaire. Preliminary steps that include the Capella Institutional Review Board (IRB) process, the selection of a panel of experts, an invitation to participate, and the preparation of the initial open-ended questionnaire took place prior to facilitating Round 1. The seven phases in the study included three rounds of questionnaires, three phases comprised of collecting and analyzing data and a final ranking phase. All phases will be described in detail in Chapter 3.
Organization of the Remainder of the Study

Chapter 1 introduced the problem and its significance, provided the historical context for the problem, and the main focus of the study. A brief description of the methodology and process to be used for data collection was provided.

Chapter 2 presents a review of literature which begins with a comparison of major learning theories (behaviorism, cognitivism, and constructivism) with a learning theory, connectivism. The chapter critiques the theory of connectivism, explores research conducted on social networking applications currently used in personal and professional environments, and presents historical data, and future projections for social networking.

Chapter 3 describes the methodology, data collection, and analysis techniques. Chapter 4 presents an overview of the process used during data collection, data analysis, and selection of the expert panel for this study. Themes that emerged during the analysis of data are also presented and discussed in Chapter 4. A discussion of the findings and how they relate to relevant literature and to the research questions as well as limitations of the study, and recommendations for further research are presented in Chapter 5.
CHAPTER 2. LITERATURE REVIEW

Introduction

Learning becomes as much social as cognitive… The Web is not only an informational and social resource but it could also become a learning medium where knowledge can be distributed as a shared, socially constructed understanding that emerges from collaboration (Brown, 2000, p. 15).

This chapter explores social networking use in educational environments, its history and learning theories that have maintained a level of influence as it relates to social networking in the field of instructional design during the past century, as well as an emerging learning theory (connectivism) that informs this study. The relevance of these theories and the introduction of connectivism are investigated in terms of guidance for how designers of learning create environments and materials to respond to today’s learning needs. Learning theories can be enhanced by other theories and used as tools to extend abilities to create courses relevant to a changing world. Lewin is often credited with saying “nothing is so practical as a good theory” (Rothwell, 2008, pp. 11).

Major Learning Theories

The major learning theories chosen for exploration are behaviorism, cognitivism, and constructivism. They were chosen because of their dominance in the past century and their relevance today in providing frameworks for instructional design practice. A descriptive overview of each theory is presented below followed by a brief description of
suggested learning activities that may be designed when applying each theory to facilitate learning. There may be elements in each theory that resemble elements in another since many theories are outgrowths of existing theory and carry some of the attributes of the established theory.

**Behaviorism**

Behaviorism is mainly attributed to B. F. Skinner (as cited in Reiser & Dempsey, 2007), who believed that “learning can be understood, explained, and predicted entirely on the basis of observable events” (p. 37). According to this theory, the learner is encouraged by using cues or prompts in the environment to proceed in a specific manner based on appropriateness of a given behavior (e.g., a stop sign indicates that a driver must press the brakes). Skinner and other behaviorists (e.g., Pavlov, Watson, and Thorndike) proposed that observable behavior caused by external stimuli indicates whether learning has taken place.

Skinner felt that the educational system would achieve greater success if positive reinforcement was practiced where the focus is on rewarding good behavior and not as much emphasis placed on punishing bad behavior. Skinner felt it was important that these rewards or positive feedback be provided to learners almost immediately after the desired behavior was demonstrated so that there would be no confusion by the learner about what behavior was being rewarded. This feedback is referred to by some behaviorists as instructional feedback or positive reinforcement. Learners would repeat their good performance in order to continue to receive positive reinforcement. This repetition would reinforce the concepts, thereby encouraging and enhancing the learning process (Reiser & Dempsey, 2002, 2007).
The learner is considered passive and begins the learning process as a blank slate (tabula rasa) and the learner’s behavior is shaped through positive reinforcement. Because the learner is viewed as reactive and only responding to environmental stimuli, there is no need to consider internal mental processes.

Proponents of behaviorism generally consider learning to be based on making correct responses to environmental stimuli and instruction as providing small chunks of information followed by questions. Behaviorists feel that learners ultimately build a large amount of knowledge by combining the small chunks attained (Clark, 2003).

A learning environment based on this theory may include the following learning activities: short lessons that provide specific directions and explanations, careful sequencing of learning activities related to difficulty (simple to complex practice) in order to promote building of knowledge through chunking, and frequent reinforcement in the form of informative feedback and tangible rewards. These activities will provide the learner with appropriate prompts and stimuli that influence learning.

Repetition plays an integral role in the behaviorism theory which does not consider the learner’s previous knowledge as a part of the learning process. This differs from the learning theory described in the next section, cognitivism, which acknowledges value in a learner’s previous knowledge and ability to relate existing knowledge to new.

**Cognitivism**

A shift from behavioral theory to cognitive theory began to occur in the late 1950’s (Ertmer & Newby, 1993) in response to a need by proponents to include the missing element of internal mental processing. Cognitivism focuses on mental activities that explain how people learn. Unlike behaviorism, cognitivism recognizes the
importance of mental activity and does not view the learner as a blank slate but one who is actively processing information in order to create new knowledge. With the shift from behaviorism to cognitivism, researchers and theorists became less concerned with overt, observable behavior and more concerned with thinking, problem solving, concept formation, and information processing (Snelbecker as cited in Ertmer & Newby, 1993).

“Cognitive learning theory explains how mental processes transform information received by the eyes and ears into knowledge and skills in human memory” (Clark & Mayer, 2003, p. 35). Cognitivism addresses how the learner mentally receives, organizes, stores, and retrieves information. The learner first receives new information for processing through two channels: visual and auditory. Information is briefly stored before entering working memory and is finally stored in permanent or long-term memory. Learning occurs when the new knowledge enters working memory and is integrated with the existing knowledge and skills in long-term memory. This integration process is called encoding. The active processing that happens in working memory is referred to as rehearsal. Once encoding happens, the learner demonstrates learning by demonstrating retrieval. If the learner is unable to retrieve information when needed, learning has failed to transfer.

A learning environment based on this theory would include the following:

- Activities that use visual or auditory, if applicable, guides (e.g., use of graphical symbols like arrows) to lead the learner to important information that should be focused on first;

- Activities that encourage learners to organize information (e.g., use of analogies, hierarchical relationships and matrices);
Activities that tie new information to existing information, content being chunked to avoid cognitive overload;

Strategies that include activities that require learners to apply, analyze, synthesize, and evaluate to encourage higher order thinking;

Activities chosen that connect to real-world experiences to encourage the learner to memorize by transferring their knowledge.

**Cognitivism vs. Behaviorism.** Major differences between behaviorism and cognitivism relate to how the learner is perceived. The cognitive theory focuses more on learners’ mental activities and processes that lead to a response. Behaviorism focuses more on a particular pattern of behavior that the learner repeats until it becomes automatic. Problem solving and information processing is emphasized more in the cognitive theory than a focus on observable behavior.

Behaviorism and cognitivism are fairly distinct theories in terms of how learning is measured. The final major learning theory examined in this section, constructivism, is not as distinct and actually contains some of the attributes described in other theories.

**Constructivism**

Constructivism is a school of psychology which believes that “learning occurs because personal knowledge is constructed by an active and self-regulated learner who solves problems by deriving meaning from experience and the context in which that experience takes place” (Seels & Richey, 1994, p. 127). Constructivists believe that individuals construct new knowledge on an ongoing basis through experiences and environmental interactions.

Constructivists believe that during the process of learning new ideas or concepts, learners select and transform information, and generate or construct their own meaning.
and ‘mental models’, and use them to decode new experiences (Bruner, 1996). Followers of constructivism (von Glaserfeld, 1995) believe that knowledge is always constructed instead of discovered or transmitted. This is a key distinction from cognitivism.

A learning environment based on constructivism would include the following learning activities: activities where learners are actively performing high-level or problem-solving that contain some ambiguous, real-world situations, collaborative learning experiences that facilitate constructivist learning, and guided discovery activities with interactivity to promote higher-level learning skills and personal meaning.

**Constructivism vs. Cognitivism vs. Behaviorism.** Constructivism is often considered a branch of cognitivism because both theories view learning as mental activity (Ertmer & Newby, 1993), although cognitive theory focuses on helping learners organize and relate new information to existing knowledge and constructivism focuses on using the mind to filter new information to create a personal, unique reality. They are both contrary to behaviorism where the focus is on repeated behavior encouraged by cues and rewards.

The learning theories presented here provide the basis for the development of learning environments and the development of future theories. These theories are periodically revisited and re-critiqued by researchers, theorists, and designers of instruction to determine if they meet current learner needs. Based on recent research related to technological developments that may alter how learning happens, the relevance of these theories is being questioned (Pettenati & Cigognini, 2007; Siemens & Tittenberger, 2009). A learning theory has grown out of this concern and is explored in the next section.
Emerging Learning Theory

The twenty-first century is often referred to as the digital age (Brown, 2000; Prensky, 2001a; Siemens, 2004), which describes the period characterized by an individual’s ability to quickly access information through the use of technology for personal and professional purposes. Advancements in technology now provide ways of communicating and learning that were nonexistent in past decades. Technological advancements also present different ways for learning to take place and different sources from which knowledge can be accessed.

Some researchers and theorists feel that the digital age has revealed learning needs that exceed differences revealed in the past and that these needs cannot be addressed by designing instruction based on the established learning theories discussed in the previous section. Siemens (2004) created a learning theory called connectivism that may better address needs of learners in the digital age. Connectivism offers a premise which includes technologies that were not prominent when many of the earlier theories were developed. Proponents of connectivism feel that the dominant theories of the past century are limited to individualized learning and are no longer applicable to how learning is happening more and more today. This learning theory, connectivism, described below, informs this research study although the existing theories provide the basis for its development.

Connectivism

The theory of connectivism emphasizes that in the digital age, “learning is no longer an internal, individualistic activity” (Siemens, 2004, p. 5). Emphasis is placed on addressing knowledge as existing in networks and learning as developing and forming
diverse, multi-faceted networks. Connectivism views knowledge as composed of *connections* and networked entities and considers knowledge development as aligned with effective uses of Internet-based computer programs designed to enable this connection to allow the sharing of data. These programs are referred to as social networking applications. Developments that have occurred in technology, specifically in social networking (e.g., blogs, wikis, social bookmarking, podcasts, online video, instant messaging, Skype™, Ning™), have helped to create this difference in how knowledge is acquired (Siemens, 2008b, p. 14).

Connectivism places learning within the dynamics of social interaction, connection and collaboration where learners access information and interact in a different manner with each other and with instructors than they have in the past. Proponents of connectivism encourage designers of instruction to use effective strategies to incorporate social networking applications familiar to many learners into the design of instruction which will allow learners to develop expertise in using social networking applications to gain knowledge through networks and develop collaborative skills that are required in constructing their own learning networks in the future.

In using the network, a learner’s focus shifts from processing to pattern recognition, allowing the learner to be less reliant on (possibly) outdated textbooks than on current information. Connectivism “is driven by the understanding that decisions are based on rapidly altering foundations. The connections that enable us to learn more are more important than our current state of knowledge” (Siemens, 2006, p. 30) because of constant changes that affect knowledge. The educator’s role changes to that of a supporter and the content becomes not as critical as the connections that are created.
Due to significant trends in learning, Siemens feels that theories developed prior to the high impact of technology present limitations because they “do not address learning that occurs outside of people (i.e., learning that is stored and manipulated by technology)” (Siemens, 2004, p. 2). Although theories are often modified as environmental conditions change, significant changes in underlying conditions may indicate a need for a new approach and Siemens contends that connectivism provides this new approach.

Siemens (2006) identified the following nine principles that should be considered when designing instruction for the digital age. Some of these principles share a resemblance to behaviorism, cognitivism, and constructivism since these existing theories provide the basis for the development of connectivism. Relevant elements of each were included in designing this theory for the digital age and are evident in the nine principles shown as follows:

[1.] Learning and knowledge require diversity of opinions to present the whole and to permit selection of a best approach.
[2.] Learning is a network formation process of connecting specialized nodes or information sources.
[3.] Knowledge rests in networks.
[4.] Knowledge may reside in non-human appliances, and learning is enabled/facilitated by technology.
[5.] Capacity to know more is more critical than what is currently known.
[6.] Learning and knowing are constant, ongoing processes (not end states or products).
[7.] The ability to see connections, recognize patterns, and make sense between fields, ideas, and concepts is the core skill for individuals today.
[8.] Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
[9.] Decision-making is learning. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision. (p. 31)
Proponents of connectivism (e.g., Pettenati and Cigognini at the University of Florence) argue that connectivism can lead to the development of learning environments that help build the capability for continuous learning. Pettenati and Cigognini (2007) discuss how connectivism might be applied to integrate different types of learning. The types of learning the authors discuss include learning that is organized and structured in terms of learning objectives, learning that is embedded in planned activities and learning derived from daily life activities (e.g., learning that comes from collaboration or exploration). Although these types of learning are not unique to connectivism, the authors indicate that the theory of connectivism encourages ideas for the development of new and effective collaborative and exploratory e-learning activities. The authors point out that collaborative knowledge construction encouraged by connectivism helps learners learn from others and also learn to value the usefulness of the network. In addition, the usefulness of a learner’s own content contributions to the network might be recognized and promote a self-perception of usefulness in learners that they would not have experienced using different learning methods. A learning environment based on connectivism would include the following learning activities: exploration and research that allow the learner to demonstrate effective use of the Internet by appropriately using social networking applications to establish connections with a network of learners, collaboration that is not specific to location (e.g. local, global), and creation and contribution to content online (e.g., wikis, blogs, social book marking, podcasts, online video, instant messaging, Skype™, Ning™).

Although learning theories do not necessarily provide solutions, they can provide focus during instructional design processes. As discussed in this chapter, theories differ
in some aspects and are similar in others. Major differences in learning theories revolve around how to design instruction using a specific theory. Table 1 contains six focus questions for designers of instruction. Each theory is compared based on the questions listed. The first five questions were identified by Schunk (1991), and the sixth focus is based on Ertmer and Newby (1993). The table was developed to provide course designers with a brief overview of learning theories in order to delineate educational practices that improve the effectiveness of learning. The integration of social networking applications into course design often presents challenges to educators attempting to use technology as a tool to improve the effectiveness of learning and not simply for the sake of using technology. The questions in this table and descriptions for each learning theory may provide course designers with a focus that will guide the course design process.
<table>
<thead>
<tr>
<th>Focus Questions</th>
<th>Behaviorism&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Cognitivism&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Constructivism&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Connectivism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>How is learning demonstrated?&lt;sup&gt;b&lt;/sup&gt;</strong></td>
<td>Ability to proceed in a specific manner evidenced by changes in observable patterns of behavior</td>
<td>Ability to actively process information in order to construct new knowledge, problem solve, transform information into knowledge (concept formation)</td>
<td>Ability to solve problems by deriving meaning from experience and context in which that experience takes place (Seels &amp; Richey, 1994) Participation, engagement</td>
<td>Ability to connect with others globally to share data</td>
</tr>
<tr>
<td><strong>What factors influence learning?&lt;sup&gt;b&lt;/sup&gt;</strong></td>
<td>Cues, prompts, external stimuli</td>
<td>Previous experiences</td>
<td>Prior knowledge and environmental interactions (always developing)</td>
<td>Diversity of network (Siemens, 2008a)</td>
</tr>
<tr>
<td><strong>What is the role of memory?&lt;sup&gt;b&lt;/sup&gt;</strong></td>
<td>Allows repetition of good performance to receive positive reinforcement</td>
<td>Information is stored in an organized meaningful manner, encoding, (information is received, stored briefly, enters working memory then long-term memory)</td>
<td>Use of mental models to decode new experiences</td>
<td>Adaptive patterns, representative of current state, existing in networks (Siemens, 2008a)</td>
</tr>
<tr>
<td><strong>How does transfer occur?&lt;sup&gt;b&lt;/sup&gt;</strong></td>
<td>Stimulus and response (repetition)</td>
<td>Active processing in working memory demonstrated by retrieval, transfer</td>
<td>Use of mental models to decode new experiences</td>
<td>Social interaction and collaboration via network connections</td>
</tr>
<tr>
<td><strong>What types of learning are best explained by this theory?&lt;sup&gt;b&lt;/sup&gt;</strong></td>
<td>Associations, task-based</td>
<td>Problem solving, reasoning, relating new to existing</td>
<td>Filter new information to create personal reality</td>
<td>Complex learning, rapid changing core, diverse knowledge sources (Siemens, 2008a)</td>
</tr>
<tr>
<td><strong>How should instruction be structured to facilitate learning based on this theory?&lt;sup&gt;a&lt;/sup&gt;</strong></td>
<td>A learning environment would include the following learning activities: short lessons that provide specific directions and explanations, careful sequencing of learning activities related to difficulty in order to promote building of knowledge through chunking, and frequent reinforcement in the form of informative feedback and tangible rewards.</td>
<td>A learning environment would include the following learning activities: the use of visual or auditory, if applicable, guides (e.g., use of graphical symbols) to lead the learner to important information that should be focused on first, activities that encourage learners to organize information (e.g., use of analogies, hierarchical relationships and matrices), activities that tie new information to existing, content chunked to avoid cognitive overload, strategies should include activities that require learner to apply, analyze, synthesize and evaluate to encourage higher order thinking, and activities that connect to real-world experiences to encourage learner to memorize by transferring knowledge.</td>
<td>A learning environment would include the following learning activities: performing problem-solving that contains some ambiguous, real-world situations, collaborative learning experiences that facilitate constructivist learning, guided discovery activities with interactivity to promote higher-level learning and personal meaning.</td>
<td>A learning environment would include the following learning activities: exploration and research that allow learner to demonstrate effective use of Internet by appropriately using social networking applications to establish connections, collaboration that is not specific to location (e.g. local, global), create and contribute content online (i.e., wikis, blogs, podcasts, online video, Skype™, Ning™).</td>
</tr>
</tbody>
</table>

Reactions from many educational theorists and designers of instruction to ideas about connectivism as a learning theory have been mixed. As previously noted, proponents of connectivism recognize it as a theory that addresses the needs of learners in the digital age while others espouse concerns. The following section presents some of the concerns.

**Critique of Connectivism as a Learning Theory**

Kop and Hill (2008) presented an overview of connectivism and offered opinions of several respected scholars and their views on whether connectivism should be viewed as a learning theory. Some of the criticism and observations cited by authors of an article regarding whether connectivism is a learning theory include the following:

Kerr (2007a) feels that the basic ideas behind connectivism were developed by Clark in 1997 and that the popularity of connectivism is due to the high visibility of “networks in the current age compared with the past.” When proponents of connectivism speak of networks, they are speaking of nodes and the network-like structures that exist in online interactions. Kerr also stressed that connectivism should not lose the lessons taught by constructivism and the need for each learner to construct his own mental models (individually). van Plon Verhagen (2006) is also critical of connectivism as a theory because he feels that there are “no new principles from connectivism that are not already present in other existing learning theories. (p. 6).

Although the authors state that “new learning environments are informing present and future trends from which both educators and students stand to benefit” (Kop & Hill, 2008, p. 11), they still do not agree that connectivism is the answer. Connectivism continues to get a great deal of attention and to play a big role in the development of new pedagogies. Many agree with those who propose the idea of connectivism that a shift is
occurring in educational theory, yet some critics (Kerr, 2007; Kop & Hill, 2008; van Plon Verhagen, 2006) agree that connectivism does not contribute positively to this shift.

Kop (2011) presented preliminary research findings from a study conducted after the completion of two connectivist massive open online courses (MOOCs) held during the summer and fall of 2010. There were 377 participants in the summer course and 1610 participants in the fall course. The author identified challenges that a connectivist learner may experience in this environment and sought to determine if these challenges were perceived by the participants as problematic. One challenge identified was self-directed learning which requires the connectivist learner to be autonomous and able to learn independently and be engaged in aggregating, relating, creating, and sharing activities in this learning environment. Although all activities were not achieved by the majority, some participants indicated that the MOOC environment allowed them to aggregate, relate, and share resources but only a minority participated in the creation (e.g., blogs and videos) activity. The author noted that some participants stated they still learned in this environment without participating in the creation activity indicating that some needed time to feel comfortable with the resources provided before getting involved in the production of creating blogs and videos and that many did not find the challenges problematic enough to prevent them from learning. Further research and analysis is planned to determine the importance of the creation activity in enhancing learning in a connectivist learning environment.

Ravenscroft (2011) argued that the connectivist approach can benefit from a focus on dialogue. He urged that dialogue should be the primary means for developing connections for learning and indicated that this is something missing from the
connectivist approach. The author suggested what he referred to as dialogue games for possible activities that may result in making and maintaining stronger connections and developing knowledge through them. The dialogue games he developed would be integrated into the course design to foster contributions to the dialogue from players/participants. This strategy would enhance the connectivist approach and help ensure that learners develop the ability to critically think and analyze during the process of connecting. He argues that without a stronger emphasis on the dialogue process, especially when used within a “mega-social interaction” (p. 156), the ultimate goal of networked learning and connectivism will have missed the mark because it lacks a focus on dialogue.

Connectivism has been critiqued and discussed in articles and blogs since it was developed in 2004 by academicians and others interested in learning theories. Some critics feel it challenges established learning theories and some question whether it is a learning theory. Proponents feel it guides designers in developing courses that use Internet-based applications to allow sharing of data. The discussions will possibly continue as the use of social networking applications in education increases.

New learning environments on which both proponents and critics appear to agree seem to relate to the ways in which communication frequently takes place in society and the Internet-based social networking tools used to accomplish this. Many of the social networking applications available today that allow users to connect and participate in collaborative experiences were not available in the past. The following section examines the use of social networking applications in educational environments.
Social Networking in Education

Social networking has engendered shifts in the manner in which learners communicate. Many college students use social networking tools to gather information as a central part of both academic and social lives. They connect locally and globally to collaborate, create, share information and play on a frequent basis. The ability of the educational system to meet the growing challenges of preparing learners to compete globally will require changes that take advantage of the shifts in the manner which learners communicate.

Siemens (2006) and other proponents of connectivism (Pettenati & Cigognini, 2007; Siemens & Tittenberger, 2009; Strong & Hutchins, 2009) suggest that through the use of social networking tools and technologies, a transformation can happen; they also warn that this transformation will not occur without careful consideration given to the tools selected and the approaches chosen. Siemens poses the following question to assist designers of instruction in tool selection: Do the tools represent how the learners will be functioning in “real life?” (Siemens, 2006, p. 41). Siemens cites a real-life example where an employee is working on-site and needs information from a product manual that is not available. If the employee could connect and collaborate within an established network, the information may be accessed by way of cell phone, laptop, or other electronic device. The network may also provide other relevant and current information not found in the product manual that might prove beneficial in solving the problem. Without the network this information would not be as readily available and the opportunity to learn efficiently or to improve performance would be lost.
The proponents of connectivism espouse that because needed knowledge is provided within networks that the process of communicating within a network is more important than what the individual learner knows. The connections that learners make in a network permit them to access the knowledge they need when the knowledge is needed. These networks can then be used in personal, educational, or organizational settings and maintained for future knowledge acquisition. In determining tools and approaches to be used to teach these skills, Siemens provides the following strategies for consideration:

[1.] Intended outcome
[2.] Nature of the learning task
[3.] Match task with appropriate medium
[4.] Consider profile and needs of learners
[5.] Meta-learning elements required (are we trying to teach content or process?)
[6.] Diverse tools/spaces/ecologies (Siemens, 2006, p. 41)

Community colleges and universities worldwide have begun using social networking software. Anderson, Canada Research Chair in Distance Education at Athabasca University, who is known for work in the field of distance education, uses and is developing social networking software to enhance learning experiences for distance students at Athabasca University. Anderson has collaborated in the development of an open-source environment in which social networking software is used to enable and encourage support and collaboration among learners. Anderson states,

With the emergence of social software, we hope to create ways for people to socially engage in cooperative and collaborative learning. The world is still following the original university model from the 13th century. There is a thirst from educators worldwide to figure out ways to operate more effectively and to add social interaction into their current delivery models (Anderson, 2009, p. 1).

Because of participatory and collaborative technology (e.g., podcasts, web logs, wikis) that learners use in their everyday lives, evidence indicates that the current vision
about education needs to expand to include learners as active participants in learning processes and to recognize the potential of social networking tools that can enable the transformation of pedagogy. These participatory and collaborative technologies allow learners who are known by the new “prosumers” (both consumer and producers) designation (Loughlin & Lee, 2008, p. 11) to participate in the learning process and to create content. Loughlin and Lee (2008) stress that “designers use social software in ways that engage learners in apprenticeship for different kinds of knowledge practice, dialogue and connectivity” (p. 12).

As technology is changing, so is the learner (Brown, 2002), which is especially related to the ways in which learners communicate with each other. Brown described one example of this which involved trouble-shooting tasks performed by photocopy repairpersons. In Brown’s (2002) example, while attempting to repair a photocopier, a repairperson ran into an unusual repair problem. Rather than consult a manual, as may have happened in years past, the repairperson contacted other repairpersons via digital messaging and other communication methods and was able to resolve the problem based on collaborative experiences with others to determine the best repair method. Learning happened using cognitive and social dimensions. This has become commonplace in today’s digital age. Brown believes that currently “a shift between using technology to support the individual to using technology to support relationships between individuals” (p. 20) exists and that during that shift new tools and social protocols will be discovered that will allow learners to help each other learn. This is directly in line with the principles of connectivism where Siemens (2006) stresses the importance of the “diversity of opinions to present the whole” (p. 31) in order for learning and knowledge
to take place. Siemens recommends the use of social networking applications as tools to allow learners to help each other learn and to form connections for future learning.

The digital age has brought with it an evolution in uses of technology. To demonstrate this evolution in instructional activities and uses of technologies, Siemens and Tittenberger (2009) divided teaching and learning into four activities (dissemination, discussion, discovery and demonstration), contrasted each activity, and described how it was performed during the mechanical, electronic, and now digital ages using educational tools of that age. A brief explanation of each activity is provided below (Siemens & Tittenberger, 2009) and followed by a sampling of instructional activities provided during each age as defined by the authors:

**Dissemination.** Provide material related to a course through lectures, video, audio, simulations and other presentation techniques.

**Discussion.** Develop activities that require interaction between learner and educator or learner and learner.

**Discovery.** Create course content where learners are involved in doing as individuals or in a group.

**Demonstration.** Require students to self-assess their understanding and instructors to evaluate their teaching approach.

During each age (i.e., mechanical, electronic, and digital), course content was provided by teachers but disseminated using different presentation methods. Dissemination was mainly accomplished through lectures and distributed handouts during both the mechanical and electronic ages. Course content in online classes was delivered through computer applications (e.g., PowerPoint®, Camtasia®) made available
via a network and in other paperless formats (e.g., CDs, DVDs, videos) during the digital age. Discussion and discovery activities during the mechanical and electronic ages required learners to schedule specific times for communication and access to resources (e.g., talking to teachers during office hours face-to-face or by telephone, experimenting in a lab environment, visiting the library, or field trips).

In the digital age, learners have direct access to a range of resources at any time and without geographical barriers by using a wide range of applications (e.g., social networking applications, virtual laboratories using simulations, and online library access) that are available via the Internet. During the mechanical and electronic ages, learners demonstrated their mastery of objectives by completing assessment activities (e.g., lab assignments and tests), during the digital age, learners are able to demonstrate mastery of learning by producing documents and other materials that are Internet-based and thus shareable over networks (e.g., websites, animations, e-portfolios; Siemens & Tittenberger, 2009). Creating shareable content encourages learners to connect, communicate, and collaborate globally with other learners, experts in various fields, future employers and other resources. These skills are in line with published reports that encourage educators to develop learning activities which encourage collaboration.

An increase in the use of social networking during the digital age has prompted research on its use in both personal and educational environments. The next section investigates recent research on social networking to determine how it is being used to determine implications for course design strategies that may enhance learning using social networking.
Related Research

In recent years, educational institutions have begun to provide social networking applications which their faculty could integrate into the design of learning activities and strategies for learning. The research reported in this section will include both social networking technology used in daily living and in educational settings. Often some disparity exists in using social networking in personal and academic environments and proponents of the use of social networking to connect instruction and learning believe this practice should change.

Many studies conducted within higher education environments related to social networking use focused on the use of specific social networking applications (i.e., Facebook, Twitter, LinkedIn) and not how the technology was used. A recent study conducted by Moran and Seaman (2011) includes both specific applications used and a discussion of how the technology was used.

The study reported that social media applications were used by nearly two-thirds of the 1,920 higher education faculty who responded to a survey to determine faculty use of social media. The use of online video ranks number one in use followed by podcasts, blogs, and wikis. One-third of all faculty surveyed indicate they restrict their social media use to online video only. Nearly one-half use other forms of social media in addition to online video. When asked about barriers in using social media for teaching and learning, lack of integrity of online submissions, privacy concerns, the amount of time it takes to develop activities, lack of training, lack of integration with school’s learning management system (LMS) and lack of institutional support.
Over 40% of faculty assigned students to read or view social media as part of course assignments, and 20% have assigned students to comment on or post to social media sites. Faculty were less likely to assign students to post for podcasts (4%) than they were to assign for blogs (8%) and wikis (7%). Neither Facebook nor Twitter were commonly used by faculty as a component of student assignments and a large proportion rated them as having a negative value for use in class (i.e., Facebook, 53% and Twitter, 46%).

Among the barriers and concerns noted above by respondents in the Pearson study was privacy. Privacy when using social networking in educational settings has been discussed in numerous studies. A review of literature revealed a study in the June 2010 edition of *Journal of Online Learning and Teaching* (JOLT) that sought to provide information on the use of non-commercial social networking applications developed for educational environments in college classes prompted by concerns associated with privacy and safety when social networking applications are used. The study was conducted by Holcomb, Brady, and Smith (2010) and included 50 graduate-level students enrolled in one online and two hybrid classes at North Carolina State University. A specific software tool called Ning Mini for Educators, co-sponsored by Pearson Publishing, was used in the study. The software is marketed as having the capability of providing benefits of using social networking while minimizing concerns relating to privacy and safety commonly associated with commercially based SNSs. Although this study did not indicate any results from testing the security or privacy claims of the software, it did explore students’ attitudes toward use of the software for communication and collaboration on various projects throughout the semester to determine if this specific...
type of social media was a useful tool and whether it provided collaborative social networking features they had used in commercially based applications. The survey findings were favorable from 88% of the students who indicated they would like to use the application in future classes for collaboration and communication with other students and teachers. The researchers added that the application provided numerous educational benefits for learning within a secure environment, thereby providing a possible alternative to commercial social networking applications. As the use of social networking applications in educational settings increase globally, concerns regarding privacy and security also increase. More investigation into this and other non-commercial social networking applications is needed as well as investigations into improvements in privacy and security features within commercial social networking applications that are popular with today’s learners and potentially useful in educational settings.

The Pew Internet and American Life Project, a nonprofit initiative, has been tracking data on Internet use and general online activities since 2000 and continues to provide regular reports on the use of technology. The Pew Internet and American Life Project (n.d.) reported data that represents average total participation in online activities from 2000 to 2009. The report shows percentages of all U.S. adults who participated in 26 different online activities during that time period. Each activity, with the exception of a status update service (e.g., Twitter™) that allows users to share short updates online, shows an increase in use. Twitter™ was not included in the research until the last year of the study. Of the 26 online activities investigated in the Pew study, two were directly related to technology that included social networking—the focus of this study. This
The report provides evidence of the overall growth in the use of social networking applications by users (age 18 and over) on both an average daily basis and periodic use. Between 2004 and 2009, the average periodic use grew from 7% to 28% whereas the average daily use grew from 3% to 15% during the same time span. Again, Twitter™ and other status update services were not included in the study until 2009. The average periodic use for these services reported by Pew was 8% for 2008-2009 and 4% for 2008-2009.

While the use of the Internet for social networking among adults has increased, some surveys indicate a greater increase in personal use than in educational settings. An ongoing study conducted by the EDUCAUSE Center for Applied Research (ECAR) Study of Undergraduate Students and Information Technology explored how technology including social networking affected college experiences for students at 39 educational institutions. Participants included freshmen and seniors at four-year institutions and all levels of students at the community colleges involved. Findings were reported in October 2009 after the first four years of the study. The survey asked respondents which technologies they were actively using in their courses at the time of the survey (February 23 through April 13, 2009) 73.1% said they used the college library website and 70.4% said they used learning management systems as well as presentation and spreadsheet software. When asked about their use of social networking sites in a course, 27.8% reported using them in a course during the semester of the survey. One quarter (25.3%) said they used wikis, 5.8% used podcasts, 6.0% used video-creation software, and 5% used audio-creations. Fewer than two in 10 used instant messaging (18.3%) in courses during the term (quarter or semester) of the survey. Participation in content creation and
sharing was revealed in students’ responses when asked if they had contributed content to a social networking site. The responses showed that 44.8% contributed to video websites, 41.9% to wikis, 37.3% to blogs and 35.0% used podcasts.

This ECAR study (Smith et al., 2009) corroborates findings in many similar studies (Pew Internet and American Life Project, n.d.) that younger generations have more actively integrated social networking into their lives than older generations; the data also shows that the gap between older and younger students is shrinking. For example, respondents ages 18-19 had the highest percentage of use (95.4%) with more than three-quarters (76%) reporting daily use; respondents age 20-24 had 94.7% and 62.9% reported using social networking daily. The ECAR study (Smith et al., 2009) reports a substantial growth of social networking sites by older users. The use by those ages 30-39 more than tripled (a 236% increase); among respondents 40 and older, social networking use more than quadrupled (a 326% increase). In addition, according to a two-year study conducted by Arbitron (Johnson, 2010), nearly half of Americans over the age of 12 have a profile on one or more social networking websites, and 30% of these users access these sites more than once per day. One year prior, only 18% reported this level of daily use (Johnson, 2010). These reported increases in overall use and the shrinking gap in use based on age indicate a widespread acceptance of social networking applications by learners. Since these learners have already experienced the sharing of knowledge provided within a network and recognize the value of accessing knowledge in this manner in their personal learning environments, they may easily adapt to the use of these tools in learning activities in educational environments. By using tools “familiar to learners, educators may be able to foster high levels of learner engagement required for
effective learning” (National Survey of Student Engagement as cited in Siemens, 2008b, p. 6).

Often research about incorporating social networking into the design of instruction focuses on the age of learners, specifically the younger learners born during the digital era. This is possibly due to frequent media coverage that focuses heavily on how children and teens use social networking sites. According to Pew Research Center surveys conducted in 2008 and 2009 (Lenhart, 2009), adults still make up the bulk of users of these websites. The report showed that over half of the overall Internet population is between 18 and 44 years old (known as generations X and Y). The younger age range of 18-32 (known as generation Y) is cited as the group most likely to use social networking applications. Responses indicated the main use by the 18-32 year olds as communication. Adult users with a profile on a social networking site more than quadrupled between 2007 and 2008, according to Lenhart (2009). Although learners of all ages enroll in community colleges, the average age of a community college student (American Association of Community Colleges, 2009) is 29 which is within the age ranged noted in the Jones and Fox 2009 Pew report as representing a group most likely to use social networking applications for communication. The community college learner is the focus of this research.

Research indicates some disagreement about who uses Internet-based social networking tools and generational differences that affect their use, although little disagreement is reported on the widespread use of social networking applications by students in their daily activities. Such tools provide opportunities to connect users locally and globally, thus expanding options for interaction. Some consensus exists that the
digital era presents a greater need for self-directed learning which requires more collaboration skills than in prior eras (Brown, 1999, 2000; Reigeluth & Carr-Chellman, 2009). There is a shift (Brown, 1999, 2000, 2002; Brown & Adler, 2008; Siemens, 2003, 2004, 2005, 2006, 2008a; Siemens & Tittenberger, 2009) between how technology has been used in the educational system in prior eras and how it can be used to produce individuals who are capable of successfully performing in the digital era. Siemens and other proponents of connectivism suggest that this shift encourages a greater use of social networking applications in the design of instruction to help facilitate the creation of the self-directed learning environments and encourage the development of learning networks for collaboration.

Although research has shown an increase in the use of social networking in almost all age groups, some instructional designers and futurists stress that learners born during specific timeframes (identified in Table 2) can only learn in a specific manner using tools common to that generation. The next section explores the research on different generations of learners and the differences, if any, in their learning needs.

**Generational Differences**

The topic of generational differences has been a much discussed topic in recent years, with some concurrence that these generational differences should be considered by instructional designers when developing instruction (Jukes & Dusaj, 2006; Prensky, 2001a). The distinction between generations is mainly based on the idea that people born within approximately a 20-year time period share common characteristics based on historical experiences, economic and social conditions, technological advances and other societal changes they experienced (Reeves & Oh, 2007, p. 295-296).
**Generations explained.** A review of literature revealed not only inconsistencies in descriptions of characteristics of each generation but also in the span of years and ages for each. For example, in reported data on generational use of social networking, the Pew Internet and American Life Project (n.d.) identified adults as 18+ years, but in a research report issued by Ofcom (2008) on social networking, the following definition of adult was cited: “16 and 17 year olds are classed as adults” (p. 5). Inconsistent descriptions have resulted in inconsistencies on how some assess differences in generations. Without consistency in descriptions, evaluations vary between evaluators and this may account for the fact that there is relatively little consensus of opinion on whether any differences exist that instructional designers should consider in course design. Table 2, created by the Pew Foundation, will be used in this paper to differentiate between each generation.

<table>
<thead>
<tr>
<th>Generation Name*</th>
<th>Birth Years, Ages in 2009</th>
<th>% of Total Adult Population</th>
<th>% of Internet-Using Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen Y (Millennials)</td>
<td>Born 1977-1990, Ages 18-32</td>
<td>26%</td>
<td>30%</td>
</tr>
<tr>
<td>Gen X</td>
<td>Born 1965-1976, Ages 33-44</td>
<td>20%</td>
<td>23%</td>
</tr>
<tr>
<td>Younger Boomers</td>
<td>Born 1955-1964, Ages 45-54</td>
<td>20%</td>
<td>22%</td>
</tr>
<tr>
<td>Older Boomers</td>
<td>Born 1946-1954, Ages 55-63</td>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>Silent Generation</td>
<td>Born 1937-1945, Ages 64-72</td>
<td>9%</td>
<td>7%</td>
</tr>
<tr>
<td>G.I. Generation</td>
<td>Born -1936, Age 73+</td>
<td>9%</td>
<td>4%</td>
</tr>
</tbody>
</table>


**Research findings.** Research conducted on generational differences during the past decade indicates relatively little consensus about whether any differences exist that are worthy of consideration for instructional designers. A review of educational research
on the subject revealed “no research-based findings or evidence drawn from robust learning theory that supports the differential effectiveness of different instructional designs or strategies across the generations” (Reeves, 2008, p. 18).

Phase 1 of a research project conducted by the British Columbia Institute of Technology (BCIT) and published in October 2009 revealed that “there is no strong evidence to support a connection between generation and technology use” (Bullen, Morgan, Qayyum, Belfer, & Fuller, 2009). More specifically, the study suggests there are no meaningful differences between generations in terms of their uses of technology, behavioral characteristics or learning preferences. These findings are based on focus group interviews with 69 students and survey responses from a random sample of 438 second year BCIT students in 14 different programs in five schools. Consistent with BCIT’s findings, Selwyn (2009) reported findings indicating that “young people’s engagements with digital technologies are varied and often unspectacular—in stark contrast to popular portrayals” (p. 1). Similar conclusions were reached by other researchers (Margaryan & Littlejohn, 2008; Reeves & Oh, 2007). Reeves (2008) pointed out that there are weaknesses in generational research related to understanding generational differences and no assumptions should be made about individuals based on a “generational cohort” (p. 20).

On the other side of the debate, futurists and commentators (Oblinger & Oblinger, 2005; Prensky, 2001a, 2001b; Tapscott, 2009) argued that since individuals grow up either with or without an immersion of digital technology, they have different ways of using and making sense of information and different expectations about learning. Learners who were born when digital technology already existed and have been
immersed in digital technology are referred to as *digital natives* (a phrase coined by Prensky, 2001a). Those who have not grown up immersed in technology have different expectations about learning than the digital natives and are referred to as *digital immigrants* (a phrase also coined by Prensky, 2001a).

According to Prensky (2001a), digital natives make up a large proportion of today’s learners, and the current educational system was not designed to teach them. Prensky (2001a) states that these learners have changed in ways far beyond generational changes in the past (e.g., slang, clothes, body adornments, music) and that these changes are attributed to the immersion in digital technology in recent years. These learners are the first generation to grow up with a rapid dissemination of digital technology. Prensky (2001b) stresses that their interactions in digital environments have caused them to think and process information differently from their predecessors. Prensky (2001b) suggested for many years that brains may be physically different as a result of this digital input, and his research in the field of neurobiology and neuroplasticity (i.e., the brain’s ability to change itself) revealed evidence that the brain has the ability to reorganize itself in response to new situations and changes in the environment by forming new brain cells throughout one’s lifetime. Prensky’s ideas are also supported with further validation that brains may change based on individual experiences, in the following statement: “Different kinds of experiences lead to different brain structures” (Perry as cited in Prensky, 2001b, p. 1).

Recent research findings on neuroplasticity have revealed new understandings regarding how the brain works. Contrary to previous beliefs, many researchers (Arden, 2010; Carr, 2010; Doidge, 2007; Horstman, 2010) have reported that based on numerous
experiments and case studies, the notions of the past about a hard-wired brain that does not change after childhood unless through the process of aging or injury are incorrect. These findings present strong evidence that the brain is able to change by forming new neural connections based on changes in the environment.

Carr (2010), futurist and former executive editor of the Harvard Business Review, writes that “neuroplasticity provides the missing link to our understanding of how informational media and other technologies have exerted their influence” on civilization. Norman Doidge is a psychiatrist, psychoanalyst, and researcher of Psychoanalytic Training and Research at Columbia University. His interest in exploring what he considered myths and beliefs about the hard-wiring of the brain started an investigation which led him to several scientists (i.e., Paul Bach-y-Rita, a pioneer in brain plasticity, p. 3; and Michael Merzenich, a leading researcher in brain plasticity) who had performed studies and investigated documented case study results that indicated that the brain can be changed through a variety of influences such as environment, thought and activity. Doidge’s (2007) discussions with these and other scientists, doctors and patients during these investigations led to his assertion that “the neuroplasticity revolution has implications for, among other things, our understanding of how… learning and technology change our brains” (p. xx). He contends that the idea that the brain can change its own structure through thought and the performance of various activities in different environments is “surely one of the most extraordinary discoveries of the twentieth century (p. xvii).”
Digital Native Learners and Digital Immigrant Designers of Instruction

Although there is little consensus about whether any generational differences exist among learners (e.g., Gen Y and Gen X) that are worthy of consideration for instructional designers (Margaryan & Littlejohn, 2008; Reeves, 2008; Reeves & Oh, 2007; Selwyn, 2009), generational differences often exist between learners and the designers of instruction (Jukes & Dosaj, 2006; Jukes, McCain, & Crockett, 2010) that may be worthy of consideration.

According to Jukes and Dusaj (2006), there is a gap between how digital natives prefer to learn and how the digital immigrants who develop learning strategies prefer to design and deliver instruction. This indicates a need to develop appropriate learning strategies to appeal to digital learners and still satisfy institutional learning requirements that the digital immigrant course designers fulfill. With technological advancements in recent years, there are many social networking tools that digital natives use regularly to connect with others and learn in social and professional settings. Course developers may be able to use many of these same tools to develop learning activities and strategies to fill this gap in educational settings. Filling this gap will satisfy requests to colleges in the 2006 U.S. Department of Education report, Charting the Future of U.S. Higher Education, to “test new teaching methods, content deliveries and innovative pedagogies using technology-based collaborative applications” (p. 6).

Jukes and Dusaj (2006) assert that learners in the digital native group are different from digital immigrants because digital natives have been bombarded with digital information all or most of their lives. The authors contend that digital natives are different not only because of “digital bombardment and the pervasive nature of digital
experiences, but are also different neurologically” (p. 2). Jukes and Dusaj’s findings were based on years of research conducted by other organizations (The InfoSavvy Group, Kaiser Family Foundation, 3M Corporation, the University of Rochester, the Human Brain Project).

Jukes and Dusaj are convinced that, due to the bombardment of digital technology and pervasive nature of digital experiences with which digital natives are faced with throughout most of their lives, their brains have been rewired. Prensky (2001b) strongly agrees with this assessment and suggests that, because of this bombardment of digital experiences and learners’ interactions with it, actual physiological (neural) changes may have occurred within digital natives.

In a presentation by Jukes and Dusaj (2006), the differences in learning preferences by digital natives and digital immigrants were summarized. These learning preferences were defined by Prensky (Jukes & Dusaj, 2006) and relate to how the individual prefers that learning activities should take place (i.e., received by learner, delivered by course designer/instructor). The following are some of the reported differences: (a) Although digital native learners prefer to receive information quickly and from multiple multimedia sources, digital immigrant teachers and designers of instruction prefer a slow and more controlled release of information from limited sources; and (b) Digital native learners prefer to multitask and interact/network simultaneously with many others learning information that is relevant to their needs, instantly useful and fun; digital immigrant teachers and designers of instruction prefer to be guided by the curriculum guide and standardized test focused on individual learning rather than learning networks.
Jukes et al. (2010) have given several presentations on the topic of digital generations and have had opportunities to speak with many educators and others in the field of education who work with digital learners. In the authors’ conversations with many of these teaching professionals in recent years, some have shared comments and complaints about digital learners. The teachers who had the most teaching experience had the greatest number of negative comments and complaints. One common concern expressed was that most of the students’ time outside of classrooms is spent on tasks such as texting, instant messaging, interacting with others on Facebook™ or MySpace™, playing games on Xbox™ or Wii™ and surfing the Internet. Examples of comments and complaints by educators and students follow:

- “What’s wrong with kids today? They cannot read the way students did 20 years ago” (Chapter 1, p. 1).

- “All the kids want to do today is look at videos on YouTube, photos on Flickr, chat on Facebook™, and play games. They have lost the ability to focus on the real skills that will help them in the future” (Chapter 1, p. 1).

- When asked by students for a response to an instructor’s complaint of, “The kids today cannot memorize the names of the states and their capitals,” the students responded by asking why they should remember the states and their capitals when they can ‘Google’ the answer in a few seconds (Chapter 1, p. 1).

Although a vast number of differences have been identified to set digital natives apart from other learners, a review of the literature did not provide support for the authors’ claims that differences exist which instructional designers should consider when designing courses. Nonetheless, Reeves (2008) concluded that although educational research indicates virtually no research-based findings to support these claims, there are “generalizable generational differences that are worth taking into consideration” (p. 20), especially when designing courses for higher education. These differences have been
considered in the design of this research study. The use of social networking applications in the design of instruction has been investigated to determine design strategies that connect instruction and learning for the learners of today. Survey results will add to the body of knowledge for instructional designers when determining strategies that enhance learning for today’s learners.

The use of social networking applications and other technology in educational environments affects not only learners but also instructional designers and others involved in designing instruction. A review of literature revealed changes in the field of instructional design and these changes are explored in the next section because they may affect both how instruction will be designed in the future and who will be the designers involved in the creation of these courses.

**Changing Roles of Designers of Instruction**

Most instructional design today is done by “designers-by-assignment” (Merrill & Wilson, 2007, p. 336) and data shows that this percentage is increasing as the number of instructional designers in key companies decreased by 27% in 2002 (Van Buren, 2003) and continues to decrease. The phrase *designers-by-assignment* was coined by Merrill to define subject matter experts, namely instructors in higher education, who find themselves in roles in which they must develop e-learning content (Carliner & Driscoll, 2009). These designers-by-assignment do not seek out the role; it is considered a part of their primary job responsibility based mainly on their expertise with subject matter (Merrill & Wilson, 2007).
The distinction of roles between instructors and instructional designers has become less clear over the years in industry and education for numerous reasons. Among those reasons are developments in technology related to course authoring tools, templates and Internet applications (Carliner & Driscoll, 2009). Course authoring tools have become increasingly useful with templates now available that guide users through processes of designing learning objectives, interactions, quizzes and all components of what is considered a good course, although these tools do not negate the need for an understanding of instructional design principles. Due to the vast number of Internet-based applications that are easily available, user-friendly and relatively affordable, the Internet is considered a major power in helping promote the idea of using instructional-designers-by-assignment to design courses because of the content creation skills users develop while using Internet tools. These content creation skills combined with subject matter knowledge and expertise have caused an increase in demand for designers-by-assignment within the corporate sector (Carliner, Driscoll, 2009).

In the academic world, the roles of instructor and instructional designer are often merged into one. When professors are hired to teach, they are usually not asked to show proof they can teach or have instructional design experience, yet the job usually requires them to both teach and design their own courses (Merrill & Wilson, 2007).

Discussion has been abundant about how these roles differ and how the different roles can help each other provide educational activities that help learners in the future. A noted instructional design professional (Merrill & Wilson, 2007) encourages the use of instructional design teams in the future to remedy to this dilemma. Merrill and Wilson (2007) compared and summarized some of the activities that are a part of the design
process and identified design roles for each member of the design team. The team he envisioned is comprised of designers-by-assignment, a master designer, and a design researcher. Merrill and Wilson identified a designer-by-assignment as one with extensive practical and content knowledge, a master designer as an expert tool user who often develops concepts and tools to solve challenging problems of practice, and a design researcher as an expert tool designer (i.e., tools including theories and methods). Each role would include multiple perspectives and different forms of expertise. Merrill and Wilson designed a team approach geared towards addressing trends for the future of instructional design that include both technology-based tools and conceptual tools in addition to the content supplied by the designer-by-assignment. For example, a designer-by-assignment might rely heavily on technology-based tools to design and develop instructional materials. The master designer may link tools to instructional design theory and determine appropriate use of tools. The designer researcher might design, test and evaluate new tools for specific uses. Each team member would provide a different perspective and expertise. This is an inclusive remedy to the concern over those not trained in instructional design taking over the responsibility for the design of instruction.

The dialogue regarding the changing roles of the designers of instruction is important and timely due to the changes occurring today that relate to course design for today’s learners, technological advancements and changes that affect how and where learning occurs (i.e., online, hybrid), as well as modes and methods of communication between the learner and other learners and the learner and instructor. The design of learning environments to address the needs of today’s learner appears more complex than in the past, and those who design instruction must be positioned to prepare them not only
for the digital era in which we live now but for the future which will be discussed in the next section.

Reflections on the Past and Visions of the Future

Visionaries have stressed for over a decade that changes should be made from a teacher-centric format to a learner-centered, lifelong learning approach (Siemens, 2003). This presents a greater need for self-directed learning that includes collaboration skills. Although progress may have been slow in the past, technological advancements can change the pace in which developments are made since many of the needed skills can be taught through effective technology uses. Technology played a role in teaching and learning in the past, but the role of technology has now become central to the design of effective instructional activities and learning environments for this era (Reigeluth & Carr-Chellman, 2009). Internet-based social networking tools not available in the past can be used to improve learning in the information age by providing the connections for learning through multi-faceted networks.

Based on results in the 2006 U.S. Department of Education report, Charting the Future of U.S. Higher Education, although much is to be applauded in the U.S. higher education system, much requires educational reform. In order to begin the process of reform, the report strongly suggests that higher education needs to determine ways to address how the current academic programs and institutions can be transformed to serve the changing educational needs of a knowledge economy. Listed among the expectations outlined, the higher education system must (a) adapt to a world altered by technology, changing demographics, and globalization in which the higher-education landscape
includes new providers and new paradigms; (b) improve student learning through effective use of information technology; (c) establish course redesign programs using technology-based, learner-centered principles; (d) promote the development of information technology-based collaborative tools and capabilities; and (e) expand the reach to adults through technology such as distance learning, workplace learning, and alternative scheduling programs. The creators and proponents of connectivism feel that through the proper use of social networking tools and technologies which foster and guide learning processes, many of these requirements can be met.

Siemens (2003, 2005) points out that, since designers of instruction have not always been in sync with learning processes, learning often has not taken place. To remedy this, learning experiences must resemble life unlike in the past when the tools that learners used in their daily lives were not applicable to their education. Learning is a continual process and should be merged with daily living to ensure that learning happens as life happens. Designers of education must begin to select appropriate tools to create networks of knowledge for learners through connections that facilitate continuous learning. For example, connections made while learners are enrolled in a class can be maintained indefinitely allowing learners to continue learning indefinitely. Social networking applications, appropriately integrated into the learning environment, allow the establishment of these connections.

Today’s educational systems are being challenged to use technology to create relevant learning activities that mirror students’ daily, globally connected lives. Learning, once viewed as confined to the years spent in school, must be transformed to be both lifelong and life-wide (Bransford et al. as cited in U.S. Department of Education,
Office of Educational Technology, 2010). The educational system is also being challenged (Brown & Adler, 2008) to engage learners by connecting web learning resources to learning standards and thereby allowing the bridging of informal and formal learning in classrooms and in personal environments. Brown also encourages both the use of currently available Internet-based applications and the discovery of new applications that facilitate collaboration and lifelong learning.

A question posed in the National Educational Technology Plan 2010 (U.S. Department of Education, Office of Educational Technology, 2010) was seeking information about what education experts thought learners should know. In summary, the responses indicated that the knowledge needed is beyond the traditional three “Rs” (i.e., Reading, ‘Riting, and ‘Rithmetic). There was agreement that collaboration, multimedia communication, and complex problem solving should be woven into all content areas. There was also agreement that, because most people will change jobs throughout their careers, they needed adaptive learning skills and to be provided learning activities that offer a deep understanding in specific domains and activities that encourage making connections which cut across domains. Learning activities that use tools like wikis, blogs, and user-generated content for research, collaboration and communication were suggested as these activities allow learners to experiment with real-world problems, develop search strategies, and evaluate the credibility and authority of websites and authors (Jenkins and Leu, Kinzer, Coiro, & Cammack as cited in U.S. Department of Education, Office of Educational Technology, 2010).

The needed skills identified in the National Educational Technology Plan present a challenge to instructional designers as they investigate ways to create the best solution
to these educational problems and enhance learning processes for today’s learner. As suggested learning activities are explored, Siemens (2004) offers the following trends in learning for consideration:

Many learners will move into a variety of different, possibly unrelated fields over the course of their lifetimes.
Informal learning is a significant aspect of learning experiences. Formal education no longer comprises the majority of one’s learning. Learning now occurs in a variety of ways—through communities of practice, personal networks, and through completion of work-related tasks.
Learning is a continual process, lasting for a lifetime.
Know-how and know-what is being supplemented with know-where (i.e., the understanding of where to find knowledge needed; Siemens, 2004, p. 1).

These trends indicate the learning process as existing in a network formation with learners sharing knowledge within the network. The learners are connected using tools that allow collaborative experiences without boundaries. Sharing knowledge in this way helps learners build needed skills identified throughout the literature review that prepare them to build networks and make connections for collaboration in the future. Learning activities that use Internet-based social networking tools are in line with research related to educating today’s learner. For example, colleges were urged (U.S. Department of Education, 2006) to test new teaching methods, content deliveries, and innovative pedagogies using technology-based, learner-centered, collaborative applications that will keep the United States at the forefront of the knowledge revolution, and these recommendations have been repeated in various forms by many educational theorists.

These urgings are resounded in key trends affecting the practice of teaching and learning identified in both the 2009 Horizon Report (Johnson, Levine, & Smith, 2009)
Increasing globalization continues to affect the way we work, collaborate, and communicate. Information technologies are having a significant impact on how people work, play, gain information, and collaborate. Increasingly, those who use technology in ways that expand their global connections are more likely to advance, while those who do not will find themselves on the sidelines. … With the growing availability of tools to connect learners and scholars all over the world — online collaborative workspaces, social networking tools, mobiles, voice-over-IP, and more — teaching and scholarship are transcending traditional borders more and more all the time. (p. 5)

Key trends outlined in yearly Horizon reports are based on extensive research conducted by the Horizon Advisory Board regarding trends affecting the practice of teaching and learning within one to five years. The key trend listed above, as indicated, was ranked number one for 2009 and was selected in the review of literature due to its relevance to the focus of this research study. This trend encompasses many of the learning requirements identified by educational leaders for today’s learners.

Similar to the 2009 report, trends identified in the recently published 2011 Horizon Report (Johnson et al., 2011) considered key drivers of educational technology for the period of 2011 through 2015 include many of the same requirements for learning in the information age. The number one trend identified in the report that influenced the practice of teaching and learning is the increasing abundance of resources and relationships made easily accessible via the Internet. The report challenged educators to revisit their roles as educators, to explore ways to best serve learners using these Internet resources, and to consider using Internet resources outside of formal campus environments. The outside resources mentioned include mobile devices (e.g., smartphones, iPads, IPods, tablets, e-books), open content, and electronic textbooks.
The 2011 Horizon Report (Johnson et al., 2011) urged higher education to respond to this trend, and, as evidenced by numerous recently held conferences on mobile computing, educators worldwide are responding. For example, EDUCAUSE held an interactive webinar (2011) on mobile technology use in education with a related conference scheduled for fall 2011. During the webinar educators shared examples of how they are using mobile technology for teaching and learning. The IOC (formerly known as the Illinois Online Conference) held its 9th annual international online conference in April 2011 with exclusive focus on mobile technology in higher education. The uses discussed included communication, collaboration, assessment and the future of mobile technology in higher education.

The number two trend in the 2011 Horizon Report (Johnson et al., 2011) pointed out that learners expect to be able to work, learn and study whenever and wherever they want, and the increased availability of the Internet feeds the expectation of access. The use of mobile devices whenever and wherever by learners also contributes to this trend, and educators were again challenged to consider ways to include this technology in learning activities. The availability of wireless network access during flights now offered by several airlines was listed as an example of how some companies have responded to this demand.

The third trend encouraged educators to be mindful that the world of work has become increasingly collaborative and global and to consider activities related to this trend when structuring student projects. The impact of technology identified here on how we teach, learn, and collaborate in almost all environments is indicative of societal
changes in the information age and is a central theme throughout much of the research conducted in the review of literature in this chapter.

Higher education is now challenged to meet the educational needs outlined in the research in order to prepare today’s learner for the knowledge work required in the information age. The 2006 U.S. Department of Education report, *Charting the Future of U.S. Higher Education*, cited examples of industries (railroads and steel manufacturers) that failed in the past because they did not respond to the changes in the world around them. The report warned that if higher education does not conduct self-examinations to determine what currently exists then move towards transforming or reforming academic programs to serve the changing educational needs, they may have their services characterized by obsolescence (U.S. Department of Education, 2006). The intent of this study is to examine and document instructional design strategies using Internet-based technologies to connect and collaborate that will assist the instructional design field in meeting the challenges of designing educational environments for today’s learners.

**Summary**

Rapid growth in the use of social networking applications in personal and professional environments has prompted an increase in integrating them into educational settings. Often this integration is done without considering whether the use enhances learning and without a guide in creating environments that respond to today’s learning needs which are dramatically different than those existing prior to the information age. The integration of social networking applications without a focus on these issues can result in ineffective uses of technology.
This chapter explored social networking use in educational environments and learning theories that can be helpful in guiding course design and providing a focus when incorporating social networking applications. Four learning theories were briefly described and compared. Suggested activities and learning environments were also included based on each theory.

Research studies and articles related to the use of social networking in education were presented to provide an overview of literature currently available. Future directions for designing instruction for the digital age were explored based on the urgings in major journals and reports (e.g., National Educational Technology Plan [U.S. Department of Education, Office of Educational Technology, 2010]) and noted instructional designers and visionaries (i.e., Reigeluth and Carr-Chellman) as well as the changing roles in the field of instructional design based on dialogues by M. D. Merrill and B. Wilson in addition to others.

Chapter 3 describes the methodology, data collection and analysis techniques. A detailed description of the seven phases of the study is included in Chapter 3 as well as a description of the panel solicitation and selection process.
CHAPTER 3. METHODOLOGY

Introduction

This study examined how social networking is being integrated into designs of instruction in community college online courses to connect instruction and learning as identified by instructional designers and designers-by-assignment. The Delphi method was used to reach consensus on identifying these characteristics. This technique was chosen because it “elicits opinion and seeks consensus of a group of experts” (Richey & Klein, 2007, p. 156). The Delphi method was developed by the Rand Corporation in the 1950s.

Although research indicates widespread growth in the use of social networking in educational settings (Siemens & Tittenberger, 2009), the literature is limited on research investigating how designers are integrating social networking into college online courses. This study elicited opinions of experts in the field of instructional design who have integrated social networking applications into the design of online community college classes in an effort to define how these applications can be used to connect instruction and learning. The study will thereby contribute to the body of work on the growing use of social networking in educational environments and build on and document past successes in the instructional design field.
Research Questions

The following research questions were developed to determine what instructional design strategies are being used to connect instruction and learning using social networking in online college courses.

1. How are instructional designers and designers-by-assignment incorporating social networking into the design of courses at the community college level?

2. What indicators do instructional designers and designers-by-assignment use as evidence of learning when social networking activities are integrated in online community college level courses?

Research Design

A mixed methods Delphi approach was used in this study with a seven-phase design strategy that included the selection of experts (i.e., panel participants), the development of three rounds of questionnaires to investigate the research questions and the analysis of data at the end of each round.

The panel of experts chosen for this Delphi process consisted of instructional designers and designers-by-assignment who have at least five years of instructional design experience with at least a bachelor’s degree and two years of experience in course design using social networking applications in higher education environments. Selection criteria are outlined in Phase 1: Selection of Participants.

Data Collection

Data was gathered using surveys that were designed in a web-based format created and administered using SurveyMonkey®, a web-based survey software tool. Panelists were asked to return each questionnaire within the time limits specified on each
questionnaire. The total commitment time required was approximately two hours over a 12-week period.

Participants were given two weeks from the date of sending the invitation for participation in the study to respond with their desire to participate. The Round 1 questionnaire was e-mailed to all who confirmed their desire to participate once the desired sample size was reached which marked the beginning of the study.

Each round was scheduled to be available for two weeks. All responses were received in less than two weeks and data collection ended at that time. Data collection ended after the third round. Survey results were electronically available to the researcher over a password-protected secure network. After the study was complete, two copies of survey data were stored by the researcher on two separate password protected portable storage devices (i.e., original and backup copy) in locked, secure locations and will be stored for seven years and treated with complete confidentiality as guided by Capella University’s IRB.

**Data Analysis**

The study used both qualitative and quantitative methodologies to analyze the data. The study used qualitative research methodologies to analyze data from the first round of open-ended questionnaires. Input collected from the open-ended questionnaire used in Round 1 was reviewed, consolidated, and used to create a table listing results to be used for the Round 2 questionnaire. A quantitative approach was used to statistically analyze data gathered in Round 2. Once data from Round 2 was collected in SurveyMonkey®, quantitative data was analyzed and summarized in a spreadsheet for the purpose of ranking and prioritizing the aggregate data.
A review of literature revealed that the determination of consensus in a Delphi study appears subject to interpretation and varies, but consensus can be determined if a percentage of agreement falls within a prescribed range (Miller as cited in Hsu & Sandford, 2007). One criterion recommended (Ulschak, 1983) is that consensus is achieved when 80% of agreement falls within two categories. This study adopted this recommendation of 80% agreement in two categories.

Seven phases were used to implement this study. The process for analysis of data is described within the associated phases in the next section.

**Phase 1: Selection of Participants**

Participants were selected using a process referred to as snowball sampling. Gall, Gall, and Borg (2003) describe snowball sampling as a type of sampling that involves asking “well-situated” (p. 179) people to recommend others that are likely to be “information-rich with respect to the purposes of a study” (p. 179). The authors define a well-situated person as someone suitable to the phenomenon of interest. As the process continues, the researcher may find other well-situated people and an increasing number of recommendations. The process continues until the desired sample size is reached.

The selection of participants began with informal discussions between the researcher and educational leaders, instructional designers and designers-by-assignment for the purpose of finding people would either participate or recommend people who would potentially participate in the study. The study was explained and the researcher provided the criteria used for the selection of this panel of experts. The researcher requested e-mail addresses for each potential participant recommended. Potential participants were contacted via e-mail with an invitation to participate in the study. The
correspondence explained to potential participants that they were recommended as an expert in instructional design with expertise in the use of social networking in educational environments and are invited to participate in the study. Procedures, requirements, and commitment required for the study was also explained (Okoli & Pawlowski, 2004).

A description of the study and criteria for participation as well as a biographical profile questionnaire and an Informed Consent Form was e-mailed with the letter of invitation. The potential participant was instructed to complete and return the biographical profile questionnaire and the Informed Consent Form to the researcher. The researcher used the completed biographical profile questionnaire to assess potential participants’ background to confirm that they met the selection criteria specified by the researcher. Each expert panel member met at least two of the criteria listed as follows:

- Instructional designer or designer-by-assignment (i.e., educator or subject-matter expert who serves as both instructional designer and instructor) with at least five years of instructional design experience and at least two years of experience incorporating social networking applications or tools (e.g., Twitter®, Facebook®, MySpace®, and LinkedIn®) into course designs in online courses for higher education.

- Instructional designer or designer-by-assignment with at least a bachelor’s degree and has designed courses for higher education using social networking applications or tools in online courses for at least two years.

- Instructional designer or designer-by-assignment with at least a bachelor’s degree with five years of instructional design experience in instructional technology, education or a related subject and at least two years’ experience integrating social networking applications into the design of online community college classes.

When it was determined that a potential participant met the criteria, that participant was placed on a list of finalists for the expert panel. Although once a minimum of 15 expert panelists were identified, the selection process was considered complete, up to 20 panelists were solicited to allow for possible attrition.
Although Ludwig (1997) states “the majority of Delphi studies have used between 15 and 20 respondents” (p. 2), Delbecq, Van de Ven, and Gustafson (1975) suggested that when surveying a homogeneous group, “ten to fifteen participants may be enough” (p. 89). Delbecq et al. further suggested that researchers keep the “number of participants in the Delphi study to a minimally sufficient number of respondents and seek verification of results through follow-up survey research” (p. 89) if determined necessary.

**Phase 2: Developed and Field-Tested Round 1 Questionnaire**

The Round 1 questionnaire was developed using SurveyMonkey® as the development tool and contained eleven open-ended questions that were aligned with the research questions. Once developed, the questionnaire was reviewed and confirmed by the researcher’s professional colleagues in the researcher’s place of work. The colleagues (i.e., review panel) included designers-by-assignment and instructional assistants who were recruited by the researcher based on their course design experience and their knowledge of commonly used social networking applications. The questionnaire was evaluated to determine if it would measure what it was designed to measure prior to use in order to establish validity (e.g., questions 1-6 addressed Research Question 1 and questions 7-11 addressed Research Question 2).

**Phase 3: Sent First Round Questionnaire**

The selected panel of experts comprised of instructional designers, designers-by-assignment and individuals in related professions who agreed to participate in this study were contacted via e-mail. The e-mail included an introduction to the survey with a link to the first round questionnaire. This first round questionnaire contained 11 open-ended questions (see Appendix A) aligned with the research questions. The experts had two
weeks to complete their Round 1 survey and submit their responses. It was predicted that the Round 1 questionnaire would take 30-60 minutes to complete.

**Phase 4: Collected, Analyzed Data From First Round—Created Second Round**

Survey results from Round 1 were collected through SurveyMonkey®, and exported to a word processing document where they were reviewed and consolidated. Duplicate data was removed and terminology used was unified with common words or key phrases that could be used in Round 2. The analysis of Round 1 data resulted in a summary list of items identified by the expert panel. This list was converted into a new questionnaire for distribution via SurveyMonkey® for the second round. The second round questionnaire included the list compiled from Round 1 in a table format for rating as well as space for comments. The Round 2 questionnaire was evaluated by a review panel recruited by the researcher to determine if it would measure what it was designed to measure prior to use. Items identified for clarification were the following: terminology used, redundant items, areas where more consolidation was needed, and eliminate unintentional guiding of feedback from participants.

**Phase 5: Sent Second Round—Collected, Analyzed Data—Created Third Round**

A link to the second round questionnaire was sent to the expert panel via e-mail. Experts were encouraged to reassess their initial judgments based on feedback shared from the first round results and to rate their agreement from the consolidated responses from Round 1 using the following response scale: SA = *Strongly Agree*, A = *Agree*, N = *Neutral*, D = *Disagree*, SD = *Strongly Disagree*. The comments reported on the Round 1 questionnaire were reported in short statements to allow participants to easily review them during Round 2 as these results were used in the second round of the study.
Consensus began forming at this phase. All statements not reaching consensus in Round 2 were moved to Round 3. Normally, as a result of Round 2, “areas of disagreement and agreement are identified” (Ludwig, 1994, p. 54).

Space for comments was included at the end of the survey. Any comments from respondents were documented at the end of the study through the analysis of responses. Experts were given two weeks to complete and submit their responses to Round 2. From these results, the third round questionnaire was prepared for distribution using those statements that did not reach consensus in the second round. The second round questionnaire was predicted to take 20-30 minutes.

**Phase 6: Sent Third Round—Collected, Analyzed Data from Third Round**

A link to the third and final round questionnaire was sent to the expert panel via e-mail. This questionnaire was developed from the analysis of data in Round 2. Experts were again encouraged to review responses and respond once more using the same rating scale used in Round 2. They were allowed to add comments regarding the list and their responses at the end of the survey. Experts had two weeks to complete and submit their responses to Round 3. A thank you note was automatically sent when they submitted their questionnaire.

Data gathered during Round 3 was analyzed using spreadsheet software to determine if at least an 80% consensus had been reached using descriptive statistics that indicated perspectives identified in the research questions. Any comments reported on the Round 3 questionnaire were documented in the final report. The third round questionnaire was predicted to take 20-30 minutes to complete.
Phase 7: Final Ranking Completed

Responses from Round 3 were analyzed and tallied, and statistics were run to determine if a consensus of at least 80% was reached. Consensus and trends were documented at the conclusion of this round.

Timeline

A link to the first round questionnaire was e-mailed to participants who responded by the date noted in the correspondence. Beginning with the first round, the timeline in Table 3 was used. Noted authors (Delbecq et al., 1975; Ludwig as cited in Hsu & Sandford, 2007; Ulschak, 1983) recommend a minimum of 45 days for the administration of a Delphi study and encourage a two week allowance of time for Delphi participants to respond to each round. The timeline in Table 3 shows the total number of days for the administration of the three rounds for this study.

Table 3
Research Timeline

<table>
<thead>
<tr>
<th>Round</th>
<th>Date Survey Sent to Participants</th>
<th>Date All Responses Received</th>
<th>Data Analysis &amp; Creation of Next Round Survey Completed</th>
<th>Number of Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/14/2011</td>
<td>1/26/2011</td>
<td>2/7/2011</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 60</td>
</tr>
</tbody>
</table>

Ethical Issues

The IRB process followed guidelines established by Capella University. As this study used mainly electronic communication (e.g., e-mail, survey links and instructions
using SurveyMonkey®), all communication carefully adhered to IRB guidelines to safeguard and protect the confidentiality and privacy of participants as they communicated electronically. Data was collected using SurveyMonkey® which uses Secure Sockets Layer (SSL) technology to protect user information to protect confidentiality and privacy. SSL technology is a secure format for transmitting private data via the internet and uses a process that encrypts data to ensure that user data is secure and available only to authorized persons. SurveyMonkey® is hosted in a secure environment that uses a firewall and intrusion detection systems to prevent interference or access from outside intruders.

A participant's Internet Protocol (IP) address, a unique numerical identifier assigned to computers connected to the Internet that identify a user's location, was not stored in the survey results. Two portable storage devices were used to store the survey data (i.e., original and backup copy) in locked file storage devices only accessed by researcher and both will be destroyed seven years after publication using a DVD/CD shredder to ensure complete destruction.

Prior to the beginning of the study, participants were provided with an informed consent document detailing what their participation in the research study would involve (i.e., time commitment, potential risks or benefits, and how their confidentiality would be protected). Participation was voluntary and there was no coercion to encourage participation. Each participant consented to participate and acknowledged their consent by clicking a link provided at the end of the electronic informed consent form. The researcher followed all guidelines required of researchers at Capella University. The
Informed Consent Form used in this study was generated using the Capella University IRB consent template as a guide.

Prior to IRB submission, approval of this study was gained from the researcher’s committee and from the School of Education at Capella University. After approval by the School of Education, the IRB application was submitted and approved. A committee conference call was conducted and approval was granted for the study to begin.

**Summary**

Although there are many variations of the Delphi method, the original objective of the Rand Corporation was to develop a technique to obtain reliable consensus of a group of experts through a systematic solicitation of judgments by using carefully designed sequential questionnaires (Delbecq et al., 1975). Because the goal of this study was to determine design strategies that connect instruction and learning using social networking in online community college courses based on the experience of designers, this process was deemed to be the best choice for obtaining consensus among experts in the instructional design field.

As social networking use continued to grow, research that investigated its wise use in educational environments became increasingly important; this chapter outlined how this research was conducted to address this issue. The chapter described the phases of research and the data collection and analysis procedures. The phases were estimated to take approximately 12 weeks total. The actual duration is shown in Table 3 and discussed in Chapter 4. Chapter 4 also presents an overview of the process used during data collection, analysis, and panel solicitation for this study.
CHAPTER 4. DATA COLLECTION AND ANALYSIS

Introduction

This study used a mixed methods Delphi approach to investigate the use of social networking applications in online college courses. The data gathered from this study documents ways in which designers of instruction integrated social networking and how they confirm if learning has occurred due to this integration. The Delphi technique was chosen because it “elicits opinion and seeks consensus of a group of experts” (Richey & Klein, 2007, p. 156). The consensus gained from this study may assist instructional designers in designing instruction that provides learners with skills (e.g., collaboration, communication, and lifelong learning) identified in recent reports as needed in the digital age. This chapter presents the data collection and analysis process for this study.

Background of Expert Panel

The expert panel selected for this study consisted of 15 instructional designers and designers-by-assignment who had at least five years of instructional design or related experience with at least a bachelor’s degree and two years of experience in course design using social networking applications in higher education environments. The highest degree earned by six of the participants was a doctorate, eight reported a masters (with two reporting ABD) and one with a bachelor’s degree. Participation was not limited to any academic discipline; Table 4 shows the academic backgrounds (i.e., majors and
concentrations) listed by the participants. Several participants listed multiple academic backgrounds with degrees earned in each. Academic backgrounds provided by panelists in Table 4 indicate a wide array of academic disciplines using social media in higher education.

Table 4

*Academic Background*

<table>
<thead>
<tr>
<th>Major / Concentration</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology</td>
<td>2</td>
</tr>
<tr>
<td>Business Administration</td>
<td>1</td>
</tr>
<tr>
<td>Business Management &amp; Information Systems</td>
<td>1</td>
</tr>
<tr>
<td>Communications</td>
<td>1</td>
</tr>
<tr>
<td>Educational Leadership</td>
<td>1</td>
</tr>
<tr>
<td>Educational Technology</td>
<td>2</td>
</tr>
<tr>
<td>Geophysics</td>
<td>1</td>
</tr>
<tr>
<td>Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>Instructional Design</td>
<td>4</td>
</tr>
<tr>
<td>Instructional Design for Online Learning</td>
<td>1</td>
</tr>
<tr>
<td>Instructional Technology</td>
<td>3</td>
</tr>
<tr>
<td>Math</td>
<td>3</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>2</td>
</tr>
<tr>
<td>Multimedia &amp; Visual Communications</td>
<td>1</td>
</tr>
<tr>
<td>Spanish</td>
<td>1</td>
</tr>
<tr>
<td>Statistics</td>
<td>2</td>
</tr>
</tbody>
</table>

In addition to educational backgrounds, information on occupations for participants was gathered as well as geographic locations. The use of social media was reported by panelists employed in six different occupations and located in colleges across the United States, from the east coast to Hawaii. Table 5 shows the occupations reported by the expert panel.
Table 5

Participants’ Occupations

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>College Professor</td>
<td>9</td>
</tr>
<tr>
<td>College Instructional Assistant</td>
<td>1</td>
</tr>
<tr>
<td>Instructional Designer</td>
<td>2</td>
</tr>
<tr>
<td>Academic Dean</td>
<td>1</td>
</tr>
<tr>
<td>Educational Consultant</td>
<td>1</td>
</tr>
<tr>
<td>Educational Web Designer &amp; Trainer</td>
<td>1</td>
</tr>
</tbody>
</table>

Two panelists in Table 5 reported being currently employed as instructional designers while five reported having held previous positions as instructional designers. All panelists reported having experience as designers-by-assignment. The panelist listed with a title of Academic Dean is employed in an administrative position that includes teaching. The Instructional Assistant reported assisting instructors in designing online courses that use social media and has provided course development assistance to new online instructors.

Selection of the panel of experts began with a solicitation process. The process ended by sending an invitation to participate in the study as described in the next section.

Panel Solicitation Process

The solicitation of participants began November 1, 2010 with informal communications between the researcher and educational leaders, instructional designers and designers-by-assignment who might potentially participate or recommend people who might potentially participate in the study. The study was explained and e-mail addresses were obtained for each potential participant.
Twelve potential participants were contacted via e-mail with an invitation to participate in the study. They were given two weeks to respond, although, due to the holiday season, that time was extended. This extension of time was also necessary because the target number of 15 participants had not yet been reached and, based on the protocol established, the study could not commence until the target number was reached.

The target number of participants for this study was set at 15 by the researcher based on information gleaned from the literature. Ludwig (1997) stated “the majority of Delphi studies have used between 15 and 20 respondents” (p. 2). Delbecq et al. (1975) suggested that, when surveying a homogeneous group, “ten to fifteen participants may be enough” (p. 89). Delbecq et al. further suggested that researchers keep the “number of participants in the Delphi study to a minimally sufficient number of respondents and seek verification of results through follow-up survey research” (p. 89) if determined necessary.

A description of the study and a biographical profile questionnaire based on the selection criteria established for participation in this study were e-mailed as attachments to the letter of invitation. As additional participants were identified the same information was sent to each. The total number of invitations to participate sent was 21. Once solicitation ended the following selection process began.

**Panel Selection Process**

Potential participants were instructed to complete and return their biographical profile questionnaires by e-mail to the researcher to indicate acceptance of the invitation to participate. The questionnaire asked participants to select descriptions that best described their professional backgrounds. The completed biographical profile
questionnaires were then used by the researcher to assess each potential participant’s background in order to confirm that she/he met the specified selection criteria. Once it was determined that a potential participant met the criteria, that participant was placed on a list of finalists for the expert panel.

Of the 21 biographical profile questionnaires received, three were determined to not meet the specified criteria. The selection process was ended at that time. Letters confirming participation were sent to 18 individuals on. The letters contained a link to the online Informed Consent Form developed by using Capella University’s Institutional Review Board’s (IRB) template to ensure it contained all required information. Potential participants were instructed to read the entire Informed Consent Form which ended with a link to the Round 1 survey. The link to the survey was preceded by the words, “By clicking on the Link to Survey link below, you are saying that you have read this information and understand what you are being asked to do. Please print a copy of this consent information for your records.”

When the participant clicked the link to Round 1, the Round 1 survey was launched. Since 15 of 18 individuals completed and submitted the Round 1 survey, the survey results contained comments by the remaining 15 participants. Since subsequent surveys were created from the results of the previous round, the three individuals who did not participate in the first round were dropped from the panel and the study proceeded with 15 participants. Table 6 shows the biographical profile questionnaire responses from the 15 participants.
### Table 6
**Expert Panel Biographical Profile Responses**

<table>
<thead>
<tr>
<th>Number of Respondents</th>
<th>Description of Professional Background</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Instructional designer with at least five years of instructional design experience and at least two years of experience incorporating social networking applications into online courses for higher education.</td>
</tr>
<tr>
<td>4</td>
<td>Designer-by-assignment with at least five years of instructional design experience and at least two years of experience incorporating social networking applications into online courses for higher education.</td>
</tr>
<tr>
<td>2</td>
<td>Designer-by-assignment with at least a bachelor’s degree and has designed courses for higher education using social networking applications or tools in online courses for at least two years.</td>
</tr>
<tr>
<td>1</td>
<td>Instructional designer with at least a bachelor’s degree with five years of instructional design experience in instructional technology, education or a related subject and at least two years’ experience integrating social networking applications into the design of online college classes.</td>
</tr>
<tr>
<td>1</td>
<td>Designer-by-assignment with at least a bachelor’s degree with five years of instructional design experience in instructional technology, education or a related subject and at least two years’ experience integrating social networking applications into the design of online college classes.</td>
</tr>
<tr>
<td>1</td>
<td>Other Related Experience and Background</td>
</tr>
</tbody>
</table>

Participants were provided space to include additional information about their professional, academic, or occupational backgrounds that might clarify their biographical profiles to be used in the selection process. Six of the participants indicated over 20 years of teaching experience each with at least eight of those years teaching online; five of the participants indicated department chair responsibilities for more than four years; three participants listed advanced certifications and awards for exemplary online course
development; six listed experience in mentoring and training online faculty in the use of emerging technologies; and two indicated experience as peer reviewers for online learning object repositories. The additional experience indicated in this portion of the biographical profile provided information that clarified some job duties performed by participants in their current occupations shown in Table 5.

Once the panel selection and informed consent process was complete, the study began. The next section details the data collection process.

**Data Collection**

Data was gathered using three rounds of surveys that were designed in a web-based format and administered using SurveyMonkey®, a web-based survey software tool. A link to each survey was sent to each participant via e-mail. Panelists were asked to return the survey by a specific date noted in the e-mail. Data collection ended after the third round.

The link to the Round 1 survey was available to participants via a link within the Informed Consent Form. This marked the beginning of data collection for this study which spanned 60 days. Literature confirmed there should be a minimum of 45 days for the administration of the study with a two-week allowance for participants to respond to each round. The due date specified in the e-mails that each participant received indicated the recommended two-week time period. Although the deadline was set for two weeks for each round, panelists responded in less time. Once responses from all participants were collected, the data was analyzed and the next round developed and distributed. On March 9, 2011, all panelists had responded to the final survey. The data collector link in
SurveyMonkey® was then closed and data was downloaded for review and analysis. The next section presents an analysis of the collected data.

**Data Analysis**

This study used the Delphi method to compile opinions of a panel of experts on how social networking was integrated into designs of instruction in community college online courses. This was accomplished through three rounds of surveys that were reviewed and validated by a review panel recruited by the researcher. The review panel (described in Chapter 3) included professional colleagues from the researcher’s workplace. The colleagues included designers-by-assignment and instructional assistants with course design experience and knowledge of commonly used social networking applications.

A review of literature revealed that the determination of consensus in a Delphi study appears subject to interpretation and varies, but consensus can be determined if a percentage of agreement falls within a prescribed range (Miller as cited in Hsu & Sandford, 2007). Ulschak (1983) recommended that consensus is achieved when 80% of agreement falls within two categories. This study adopted this recommendation of 80% agreement in two categories.

Each round was developed using SurveyMonkey® as the development tool. The surveys were designed to answer the following research questions by soliciting the opinions of a panel of experts in the field:

1. How are instructional designers and designers-by-assignment incorporating social networking into the design of courses at the community college level?
2. What indicators do instructional designers and designers-by-assignment use as evidence of learning when social networking activities are integrated in online community college level courses?

Round 1 was sent to participants and consisted of eleven open-ended questions (see Appendix A). Six of the eleven questions in the survey related to Research Question 1, and six of the eleven survey questions related to Research Question 2 with one survey question relating to both research questions. One of the goals in Round 1 was to generate a wide range of responses and opinions from the expert panel based on their experiences. These responses resulted in a list of comments to explore with the expert panel in successive rounds.

All participants had responded within 12 days of being notified. After all responses were collected the researcher downloaded the responses into a Microsoft® Word document, reviewed the data, and consolidated responses by looking for similarities and removing duplicates. Once consolidated, further analysis determined that key words used by the panel allowed their statements to be categorized under themes related to each research question. Following is a list of themes that emerged during this analysis:

The themes related to Research Question 1 were

- communication
- experimentation
- design and implementation
- interacting
- feedback and participation
- extending knowledge
The themes related to Research Question 2 included

- degree of relevance and interest
- participation
- performing research
- employment

A total of 70 unique statements were identified and used for the second round survey (see Appendix B). Forty-two of them related to Research Question 1 and 28 related to Research Question 2. Each statement was placed under the associated theme heading followed by rating criteria to solicit panel opinions on each using the following Likert-type scale qualifiers: (a) Strongly agree, (b) Agree, (c) Neutral, (d) Disagree, and (e) Strongly disagree. Panelists were provided with a Comments section at the end of each round to share any survey-related comments with the researcher. The acronym SNSs (Social Networking Software) was used in the three survey rounds when referring to social networking software applications.

Consensus (80% agreement in two categories) was reached for 36 of 70 statements at the end of Round 2. Round 3 (see Appendix C) contained the 34 statements that did not reach consensus in Round 2. Participants were again required to rank their opinions based on the Likert-type rating scale used in Round 2. Consensus was reached in Round 3 for 25 of the 34 statements not reaching consensus in Round 2, resulting in a consensus of 61 out of 70 statements used to elicit opinions and seek consensus on the two research questions in this study. Thirty-six of the 61 statements that reached consensus related to Research Question 1 and 25 related to Research Question 2.
The 61 statements reaching consensus are shown in Appendices D and E.

Consensus data for Research Question 1 is shown in Appendix D and Appendix E shows data for Research Question 2. Each appendix lists the statements separated into the themes associated with each research question.

Table 7 presents a summary of the total consensus reached in rounds two and three for each research question. As indicated above, 61 of the original 70 statements derived from the results in Round 1 reached consensus by the end of Round 3 which ended the study.

<table>
<thead>
<tr>
<th>Round</th>
<th>Survey Sent to Panelists</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>11 Open-Ended Questions</td>
</tr>
<tr>
<td>2</td>
<td>70 Statements</td>
</tr>
<tr>
<td></td>
<td>Total Surveys Received</td>
</tr>
<tr>
<td></td>
<td>Reached Consensus</td>
</tr>
<tr>
<td></td>
<td>Research Question 1</td>
</tr>
<tr>
<td></td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Research Question 2</td>
</tr>
<tr>
<td></td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>36</td>
</tr>
<tr>
<td>3</td>
<td>34 Statements</td>
</tr>
<tr>
<td></td>
<td>Total Surveys Received</td>
</tr>
<tr>
<td></td>
<td>Reached Consensus</td>
</tr>
<tr>
<td></td>
<td>Research Question 1</td>
</tr>
<tr>
<td></td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Research Question 2</td>
</tr>
<tr>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Consensus Reached</td>
<td>Research Question 1</td>
</tr>
<tr>
<td>After Round 2</td>
<td>22</td>
</tr>
<tr>
<td>After Round 3</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
</tr>
</tbody>
</table>
Summary

The Delphi approach was used to solicit opinions of a 15-member panel of experts in a study designed to answer the following research questions:

1. How are instructional designers and designers-by-assignment incorporating social networking into the design of courses at the community college level?

2. What indicators do instructional designers and designers-by-assignment use as evidence of learning when social networking activities are integrated in online community college level courses?

Prospective panelists were contacted by e-mail with a letter of invitation and provided a description of the study and the process to be used, (e.g., number of rounds, timeline). Those who expressed interest in participating were then asked to complete a biographical profile questionnaire to indicate their educational and professional background. The biographical profiles were analyzed, and once the researcher determined that prospective panelists met the specific criteria for participation, a letter of participation which contained a link to the Informed Consent Form was e-mailed to each panelist. Once panelists accessed the Informed Consent Form they were instructed to read the form and indicate their understanding of what they were being asked to do by clicking the link provided at the bottom of the form which allowed them to access the Round 1 survey instrument.

The Round 1 survey (see Appendix A) presented the panelists with a list of eleven open-ended questions aligned with the two research questions. The panelists were instructed to respond to each question with their opinions based on their experiences with and knowledge of the use of social networking applications in online community college courses. The statements were reviewed, analyzed and consolidated to form a total of 70
unique statements. The 70 statements were separated into categories based on themes that emerged and split into two sections representing the two research questions. These statements were used in the Round 2 survey (see Appendix B).

Only those statements that did not reach consensus in Round 2 were used in Round 3 survey (see Appendix C). The Likert-type scale used in Round 2 was also used in Round 3. Of the 70 statements sent to the panelists in Round 2, 61 reached consensus by the end of round 3. Those reaching consensus are summarized and discussed in Chapter 5. Chapter 5 will also provide critical reflections, conclusions, and recommendations for further research.
CHAPTER 5. RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

Many educators and instructional designers have observed a disparity between college students’ daily uses of social networking applications to share information locally and globally and the lack of using them in educational environments to make connections for learning (Loughlin & Lee, 2008). This disparity prompted an increase in incorporating social networking applications into instructional designs in an effort to build connections and enhance learning using applications familiar to many of today’s learners (Anderson, 2009).

Ways in which social networking applications are being incorporated vary as more and more educators begin integrating these applications. This study sought to provide documentation on ways in which a panel of experts incorporated social networking into designs of instruction and indicators of learning that the panel cited as evidence that this integration is working in community college level online courses. The data gathered from this research may assist instructional designers, designers-by-assignment and others in designing instruction that provides learners with skills needed in the digital age as suggested by many learning theorists in the literature review. The review described the digital age as presenting a greater need for lifelong, self-directed learning that includes problem-solving and collaboration skills than in prior eras (Brown, 1999, 2000; Reigeluth & Carr-Chellman, 2009).
This chapter provides an analysis of the results of an investigation of the *wise* uses (defined in Chapter 1) of social networking applications in education to connect instruction and learning for today’s learners based on the experiences detailed by a panel of experts and relevant to the review of literature.

**Overview and Discussion of Findings**

A mixed methods Delphi approach was used to examine how social networking is incorporated into the design of online college courses and indicators panelists recognize as evidence of learning when social networking activities are integrated. As indicated, this study followed the recommendation of Ulschak (1983) that consensus is achieved when 80% of agreement falls within two categories.

Round 1 generated 125 statements which were analyzed and consolidated to form a total of 70 unique statements. Further analysis after consolidation revealed themes (i.e., keywords used by panelists and dominant ideas in responses) that were used to categorize statements in subsequent rounds based on their alignment with the two research questions.

After analysis of Round 2, 36 of the 70 statements reached consensus. Twenty-two were related to Research Question 1 and 14 were related to Research Question 2. Thirty-four statements not reaching consensus in Round 2 were moved to Round 3 according to protocol established in Chapter 3.

In Round 3, panelists were presented with the 34 statements not reaching consensus in Round 2 and again asked to review these statements and indicate the choice that best described their opinion using the same scale provided in Round 2. This allowed
the panelists to reflect on these statements and reassess their opinions from the previous round. Consensus was reached in this final round on 25 of the 34 statements. Fourteen of the 25 statements related to Research Question 1 and 11 related to Research Question 2. Consensus was reached by the end of Round 3 on 61 of the 70 statements.

Table 8 outlines the number of statements reaching consensus in rounds two and three as well as the numbers of statements that did not reach consensus. The statements are listed by associated theme.

<table>
<thead>
<tr>
<th>Theme / Research Question</th>
<th>Number of Statements</th>
<th>Number Reached Consensus</th>
<th>No Consensus Reached</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Round 2</td>
<td>Round 3</td>
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<tr>
<td>Research Question 1</td>
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<td></td>
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<tr>
<td>Communication</td>
<td>12</td>
<td>8</td>
<td>3</td>
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<td>Experimentation</td>
<td>11</td>
<td>3</td>
<td>4</td>
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<tr>
<td>Design and implementation</td>
<td>6</td>
<td>4</td>
<td>2</td>
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<tr>
<td>Interacting</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Feedback and participation</td>
<td>4</td>
<td>3</td>
<td>1</td>
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<tr>
<td>Extending knowledge</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Research Question 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of relevance and interest</td>
<td>17</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Participation</td>
<td>6</td>
<td>4</td>
<td>2</td>
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<tr>
<td>Perform Research</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Employment</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>36</td>
<td>25</td>
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</table>

Findings in this study indicate a use of social networking applications by a panel of experts that is in line with recent reports related to educating today’s learners. Each year the Horizon Project’s Advisory Board members rank the top trends and issues that
will have a potential impact on current educational practices in higher education. The top three trends (described in Chapter 2) identified in the 2011 Horizon Report (Johnson et al., 2011) were (a) an increased abundance of Internet resources and mobile devices; (b) expectations by learners to be able to work, learn, and study whenever and wherever they want; and (c) the world of work has become increasingly global and collaborative.

Panelists in this study have integrated social networking applications into course designs in ways that, as the report urges, challenged their roles as course designers and educators. The open-ended question format of Round 1 allowed panelists to share personal examples of their experiences. For example, one panelist mentioned that the traditional role of educator normally includes lecturing, presenting, and demonstrating where the teacher represents the main source of knowledge beyond the textbook. The incorporation of social networking applications into the courses changed the scenario because students were relying less on the teacher or the textbook. By using social networking students took more responsibility for their learning and relied on other contacts and resources to which they have connected (both locally and globally) for information. Several panelists indicated that they used supplemental texts but mainly relied on Internet-based resources and e-books, stating that these resources provided more current information and were less costly or free of charge. Although most of the panelists used a campus-managed learning management system (LMS), they all used social networking applications for collaborative activities. Instead of using the campus LMS discussion board for communication or collaborative activities, for example, most reported using a social networking application like Facebook®. Panelists stated that discussions via social networking applications revealed levels of comprehension not
revealed using LMS, and there was a drastic increase in class participation when using social networking. Panelists reported that, although not a course requirement, the majority of learners either owned or had access to mobile devices that were used in the collaborative activities, and most reported using them daily.

During Round 1 of this study several panelists described their uses of mobile technology, with specific emphasis on smartphones and similar hand-held mobile devices and associated applications that allowed students to communicate and collaborate using mobile technology. Though not listed by name, in the statements derived from Round 1 and used in the subsequent rounds, mobile technology use is embedded in several of the responses from panelists under the Communication, Interacting, and Feedback themes. For example, panelists reported using Facebook® in online classes to keep students updated on upcoming class events and breaking news items relevant to course content and for collaborative projects (locally and globally) and using Twitter® during synchronous interactions between instructor and students as a medium of feedback, interaction and participation.

Several panelists in this study reported holding virtual office hours via mobile devices because it allowed participants to be anywhere. Learners reported to panelists that they held study sessions with other learners via mobile devices which allowed them to schedule these sessions at times available to the members without concerns about the location of the learners. Other panelists stated they use wikis and blogs in their classes and indicated that they have included leading questions to encourage discussion and collaboration. This process was found to be successful for panelists in encouraging interaction and in modeling responsible use of the tools.
Some of the panelists in this study shared learning activities that included collaboration with classes in other countries using social networking applications. An agreement was made through appropriate channels prior to the beginning of these collaborative activities. They reported achievements that may otherwise not have been possible. For example, one course designer who taught foreign languages described activities where students enrolled in a Spanish class in the United States completed group activities with students in Mexico. The command of the non-native language increased at a greater rate than the panelist had experienced in classes where social networking had not been used to bring two languages together globally via Internet-based tools. In the past costly trips to Mexico had been the activity used to immerse students in the culture and language of Mexico.

As noted, responses by panelists addressed many of the trends identified in the 2011 Horizon Report (Johnson et al., 2011) in addition to other learning activities geared toward enhancing the teaching and learning processes for learners in the information age (also known as the digital age). In describing how they integrate social networking into course design, the expert panel indicated a strong awareness of these issues. The following section discusses these findings.

**Research Question 1: How are instructional designers and designers-by-assignment incorporating social networking into the design of online courses at the college level?**

Statements from the panelists related to Research Question 1 indicate a focus on sharing data through collaborative strategies and on making online connections that allow the learner to construct their own learning resources which may extend beyond the life of
the class. The focus on collaboration and making connections is echoed in the 2011 Horizon Report (Johnson et al., 2011) discussed in the previous section and closely resembles the collaborative knowledge construction encouraged by Siemens (2004) based on the Connectivism learning theory. Siemens emphasized that in the digital age “learning is no longer an internal, individualistic activity” (p. 4). Siemens identified knowledge development as being aligned with effective uses of Internet-based computer programs that allow the sharing of current data.

When panelists were asked in the Round 1 survey what learning theories (e.g., behaviorism, cognitivism, constructivism, and connectivism) guided their decisions to include social networking opportunities in their design of online instruction and why, 12 of the 15 panelists responded. Although the majority of responses included more than one theory, nine of the 12 included connectivism. It can therefore be concluded that the underlying focus of many of the responses from the panel was guided to some extent by this theory.

When asked how the panel members incorporated social networking applications into course design, a list of 36 statements (see Appendix D) resulted in consensus. Of these, two statements met the consensus protocol set at 80% in two categories although the choices selected by the panelists did not support constructive conclusions. Specifically, under the theme of Experimentation, the statement “making the use of SNSs an optional component of the class for the benefit of those uncomfortable or not interested in SNSs” reached consensus. The two categories and level of agreement on this statement were 53.3% Strongly Agree and 26.7% Disagree. This statement was skipped by two panelists, which may have had an impact. One panelist commented that
the reason they did not respond was that they agreed with the “…optional…” portion of the statement but did not agree with the “…for the benefit of…” portion. Since there was not an option on the scale provided that allowed them to provide a response they felt was appropriate, they chose to skip the statement. The other skipped response may have been for the same or a similar reason. This may indicate why the responses were near both ends of the scale. This statement may have yielded results that indicated advocacy if written without these two built-in options. Following established protocol, this statement was included in the list in Appendix D of those reaching consensus although it has been identified with an asterisked (*) notation followed by a brief explanation of the panelists’ selections.

Under the theme Feedback and Participation, the statement “using SNSs to allow students to invite their social peers into a class discussion for feedback and participation when deemed appropriate by instructor” reached consensus of 80%. The two categories and level of agreement on this statement were 60.0% Agree and 20.0% Disagree. One panelist commented that they responded with Disagree due to major concerns regarding privacy and security issues that could arise when social peers not enrolled in the class are allowed to participate. Concerns regarding privacy and security related to the use of social media in education have been noted in publications in recent years and this concern, though only specifically stated by one of the panelists, may have a relationship to the responses received on this statement. Following established protocol, this statement was included in the list in Appendix D of those reaching consensus although it has been identified with an asterisked (**) notation followed by a brief explanation of the panelists’ selections.
Six of the remaining 34 statements in this study that reached consensus did so within two categories that did not indicate strong advocacy. The two categories were *Agree* and *Neutral*. The percentage of agreement where panelists chose *Agree* averaged 66% and *Neutral* averaged 18%. Four panelists commented that their choice of neutral was due to limited experience with learning activities related to these statements. Two of the four stated that, although they felt these statements were viable, they had little or no experience using them in their course development thus far and therefore could not strongly advocate their use. Following protocol established for this study of consensus of 80% in two categories, the six statements have been included within the list in Appendix D of those reaching consensus although they have been identified with an asterisked (****) notation followed by a brief explanation of the panelists’ selections.

The remaining 28 statements reaching consensus represent *strong advocacy* by panelists. They are shown below. For a complete listing of all statements reaching consensus for Research Question 1, see Appendix D.

- Integrating SNSs so they represent a different way of communicating rather than as additional coursework.
- Using SNSs to keep students updated (e.g., using Facebook) on upcoming events and breaking news items relevant to course content and topics.
- Creating assignments that require students to engage in social networking in order to complete them (e.g., specific questions requiring that they listen [if possible] to a podcast [closely adhering to the guidelines established by the Americans with Disabilities Act (ADA) for individuals with disabilities].)
- Using SNSs for discussion purposes.
- Providing opportunities for students to continue communicating with instructor and class via SNSs after completion of course (or graduation).
- Using SNSs in ways that allow students to demonstrate and apply concepts learned.

- Including student-created videos (developed with SNSs) in lectures as learning tools.

- Including both academic and non-academic wiki collaborative group projects as assignments.

- Allowing students to investigate, organize and lead virtual field trips using SNSs (e.g., Second Life) to locations integral to a class assignment.

- Allowing students to replicate real-world environments and events using SNSs (e.g., Second Life) and collaborate virtually on topics related to assignments.

- Encouraging the global use of SNSs by including collaborative assignments with students in other countries.

- Sharing media among students that they find enjoyable, engaging, and enlightening.

- Guiding students by modeling responsible use of SNSs.

- Designing assignments around specific blog posts.

- Feeding guiding questions to wikis to encourage discussions, design and collaboration.

- Requiring students to design and implement blogs.

- Identifying, linking, and sharing relevant videos (e.g., YouTube) regularly.

- Posting links to articles (e.g., Facebook) and encouraging students to comment on them.

- Requiring students to build wikis and interact with other class members via wikis.

- Guiding the use of SNSs by setting limits (i.e., moderating Facebook interaction, curating content and limiting podcast time).

- Providing optional assignments where students may choose to interact with other class members via SNSs.
• Allowing students to use SNSs during synchronous class sessions.

• Allowing students to use SNSs as a portal to show their work to a larger audience for feedback or demonstration of their accomplishments.

• Using SNSs during synchronous interactions between instructor and students as a medium of feedback and participation (e.g., Twitter).

• Encouraging students to join online organizations related to course content that may introduce them to resources and outlets for lifelong connections and learning (e.g., LinkedIn).

• Using SNSs to create an environment where students are as comfortable working together online as they would be in a face-to-face class.

• Requiring students to join online organizations related to course content that may introduce them to resources and outlets for lifelong connections and learning (e.g., LinkedIn).

• Using SNSs to allow extended communication between the class and the public rather than using a private forum contained within the institution’s learning management system (i.e., local business representatives).

Based on its members’ experiences, the expert panel agreed that these statements represent ways for instructional designers and designers-by-assignment to incorporate social networking into online courses to enhance the teaching and learning process as a wise use of technology. The responses provided by the panelists indicate ways in which they used social networking to achieve the needs of today’s learner as identified in recent articles, studies, and by noted theorists and leaders in education. A strong indication of the panelists’ wise use is evident in their reference to ways they have used these tools in classes and not based on speculations. For example, when asked to respond to open-ended questions in Round 1 or statements in subsequent rounds, some chose to skip those about which they had no experience. In other instances, based on their experiences, some recognized the potential for success with some of the statements in the study and
responded in a manner that did not disagree but did not express strong advocacy either. They replied with what they had tried and what had indicated success in achieving the goals of providing for the needs of today’s learner. As stated in the definition of wise use in Chapter 1, panelists provided opinions on how they have used technology in their courses based on their informed use of social networking applications that focus on what today’s learners need in order to be self-directed, lifelong learners with problem solving and collaboration skills that enable them to access relevant, current information using technology that allows global access to resources.

Whereas Research Question 1 asked how the integration may be achieved and the data collected described ways in which this can happen, Research Question 2 asked what indicates that the integration worked. The following section discusses results collected for Research Question 2 related to evidence of learning. The expert panel provided statements based on experiences that indicate learning has occurred after social networking applications have been integrated.

Research Question 2: What indicators do instructional designers and designers-by-assignment use as evidence of learning when social networking activities are integrated in online community college level courses?

The panel reached consensus on 25 statements (see Appendix E) related to Research Question 2. This question sought to identify indicators that the panel of experts recognized as evidence of learning when social networking activities are integrated in community college courses.
Of the 25 statements that gained consensus, one met protocol set at 80% in two categories although the choices selected by the panelists did not support constructive conclusions. Specifically, under the theme of Degree of Relevance and Interest, the statement “students produce better quality papers and projects than in classes without the use of SNSs” reached consensus at 80%. The two categories and level of agreement on this statement were 53.3% Neutral and 26.7% Disagree. One respondent indicated that the choice of Neutral was because courses they had designed and taught where social networking was used did not require the creation of papers and social networking applications had not yet been used to produce projects in these classes. Due to the varied academic disciplines and educational backgrounds of the panel this may be true for many of the respondents where writing papers or producing projects may not be a part of course activities or requirements in the courses they design. Following protocol established for this study of consensus at 80% in two categories, the statement has been included within the list in Appendix E of those reaching consensus although it has been identified with an asterisked (**) notation followed by a brief explanation of the panelists’ selections.

Eleven of the remaining 24 statements reached consensus without strong advocacy. As with Research Question 1, the two categories in which consensus was achieved without strong advocacy were *agree* and *neutral*. The percentage of agreement for which panelists chose “*agree*” averaged 64% and “*neutral*” averaged 20%. No comments were provided on why these choices were made. Further review of these 11 statements revealed that they are all within the same theme of Degree of Relevance and Interest. Since this research question required panelists to provide what they considered evidence of learning due to the integration of social networking activities their responses...
were based on an assessment of behaviors from learners of varying ages or generations. Although there is little consensus indicated in a review of literature on whether any generational differences among learners exist that are worthy of consideration for instructional designers (Margaryan & Littlejohn, 2008; Reeves, 2008; Reeves & Oh, 2007; Selwyn, 2009), generational differences that may be worthy of consideration often exist between learners and the designers of instruction (Jukes & Dosaj, 2006; Jukes et al., 2010). Reeves (2008) concluded that, although educational research indicates virtually no research-based findings to support these claims, there are “generalizable generational differences that are worth taking into consideration” (p. 20), especially when designing courses for higher education. These generational differences may have had an effect on responses received in these 11 statements due to differences in perceptions of what is relevant or of interest to different generations. Following protocol established for this study of consensus at 80% in two categories, these statements have been included within the list in Appendix E of those reaching consensus although they have been identified with an asterisked (****) notation followed by a brief explanation of the panelists’ selections.

The remaining 13 statements reaching consensus represented strong advocacy. They are shown below. For a complete listing of all statements reaching consensus for Research Question 2, see Appendix E.

- Improved retention rates in classes that include social networking activities.
- Students expressed an interest in learning more about particular topics because of what they learned in class when using SNSs.
- Students’ comments and involvement in discussions have a higher degree of relevance and interest.
- Classroom discussions with students demonstrate a greater depth and breadth of knowledge and an awareness of new and emerging technologies.

- More vigorous class discussion threads and interactions between students related to course topics.

- Students are able to demonstrate their understanding of concepts by creating shareable content like videos or podcasts.

- Discussions reveal levels of comprehension not revealed using other more commonly used discussion mediums (e.g., discussion boards).

- Anecdotal evidence from current and former students regarding positive effects SNSs had on their learning experience.

- There is an increase in class participation in some activities when students use SNSs for communication.

- Increased participation in collaborative activities (whether required or optional).

- Increased scores on collaborative projects.

- Students indicate learning by using SNSs to find solutions to course related problems not contained in textbook.

- Students are able to perform research on their own using SNSs.

Based on their experiences, the expert panel agreed that these statements represent evidence of learning when social networking activities have been used wisely in online college courses. Panelists began by providing valuable responses to the open-ended Round 1 questions which resulted in subsequent survey rounds and finally in the documentation of ways by which social networking applications can be integrated into community college courses and of indicators which show that the integration has enhanced the learning process. The data gathered in this study can provide documentation to those interested in incorporating technology into online college
courses, though it is not without its limitations. Some of the limitations are discussed in the next section.

**Limitations**

The focus of this study was on fully online courses and thus did not gather data on courses using other methods (e.g., hybrid), although those methods may also represent a large student population of social network users. This limitation was deliberate, due in part to possible differences in strategies used to integrate social networking activities or evidence of learning the panel may have experienced when designing hybrid classes. A study that includes hybrid course delivery is listed among recommendations for further research.

The launching of the study was delayed by eight days due to a holiday and due to not having commitments from the targeted number of 15-20 participants by the date originally set. When the letter of invitation was originally sent, the researcher received “out of office” replies from some prospective panelists indicating that they would respond after the next semester started. Responses to the letter of invitation were received earlier than expected but, in retrospect, sending the letters earlier may have avoided the “out-of-office” replies that caused a great deal of unnecessary concern for the researcher.

During data analysis it was discovered that one of the statements reaching consensus without strong advocacy actually contained two choices which may have been confusing if a panelist agreed with one part and not the other. This may have been
avoided if the question had been split so that panelists were provided with single choices in each.

When data was reviewed and analyzed after Round 3, the researcher was concerned about the number of statements that reached consensus within two categories (as dictated by protocol set), that did so without indicating a strong advocacy (i.e., agree and neutral). Varying levels of experience with activities or strategies described in some statements caused panelists with limited or no experience to respond with “neutral” because, although they did not disagree, their limited experience made them unsure, and neutral was the only response that was close to their opinion. A notation in the directions was considered that would ask panelists to skip a statement if the level of experience was limited or nonexistent would have possibly yielded more relevant responses and stronger advocacy towards agreement or disagreement. After reviewing the data and comments again, it became apparent that the panelists’ response of neutral expressed their opinion using the choices provided, which was the goal. The statements that reached advocacy will provide ideas to those who are seeking guidance on integration strategies. The opinion of the panel of experts, based on the professional backgrounds and experience using social networking applications that resulted in conducting this study, can serve as a catalyst to course designers seeking ways to integrate technology.

As data collection ended and analysis began several related ideas arose that can prove of value to the field of instructional design. Those thoughts and ideas are offered in the next section.
Recommendations

This study provided the instructional design field with data that demonstrates how social networking applications have been used by a 15-member expert panel comprised of instructional designers and designers-by-assignment who had at least five years of instructional design or related experience. Based upon the results of this study the following recommendations for future research are presented for consideration:

- The focus of this study was on fully online courses and did not gather data on courses using other methods of delivery (e.g., hybrid) although those methods may represent a large student population of social network users. Replication of this study in hybrid classes is recommended. Among the reasons for this recommendation are the possible uses of social networking applications within learning management systems or outside of them, and how the social networking applications are deployed within the educational environment due to security constraints or established social networking policies which are becoming common in many educational settings.

- Replication of this study using the same or similar questions but, unlike this study, within the same academic discipline. Some of the statements in the results of this study were more appropriate in some disciplines than others (e.g., statement regarding employment, statement regarding writing papers).

- Using this study as a springboard, investigate wise use of mobile technology in higher education for communication, collaboration, and assessment.

- Although social networking has been discussed extensively, the value that it can provide to the educational process has not truly been realized. With further use of social networking in higher education as new applications appear, educational environments will change along with the use of social networking. For example, the results from this study, using the same or similar questions, could be quite different if it were repeated two years later. Replication of this study in two years is therefore recommended as well.

- Although it was somewhat challenging to find participants for this panel because of the criteria set by the researcher, it was important to maintain the educational level and other criteria for this study. For future studies it is recommended to increase the amount of experience since that may have garnered stronger advocacy for at least some of the statements.
• Replicate this study but limit the participants to one college campus. Results may be helpful to campus personnel for the purpose of establishing social networking guidelines, policies and integration tools, and techniques for wise use of social networking applications within their environment based on the campus network, security, departmental structure and other issues specific to their needs.

• Future research should focus on security and privacy issues related to social networking and the use of non-commercial social networking applications to encourage use of social networking applications in educational environments by those who are leery of privacy and safety concerns. More research is needed on social networking applications that maximally ensure privacy and safety while providing all of the social networking capabilities useful to today’s learners.

Recommendations have been provided to encourage continued research on this topic. With the continued growth of social networking applications and continued focus on their use in educational environments, it is important that instructional designers and designers-by-assignment have the most current information on strategies that indicate good integration of this technology. Information abounds on the numerous social networking applications in existence today but, as indicated in the next section, information remains somewhat limited on how it is being integrated and whether its use has resulted in improving the way we prepare today’s learners for the digital age.

**Conclusion**

The use of social networking applications in educational environments is discussed regularly in numerous publications worldwide. The literature remains limited on how these applications are incorporated into the design of online college courses by instructional designers or designers-by-assignment and on indicators used as evidence of learning. Educators who are interested in integrating social networking applications may
use the survey results from this study as a guide to begin the integration process. Anderson (2009), Canadian Research Chair in Distance Education at Athabasca University who is known for work in the field of distance education, stated, “There is a thirst from educators worldwide to figure out ways to operate more effectively and to add social interaction into their current delivery models” (p. 1). This research study helps to address this investigative void.

Research shows that educational needs of the digital age are dramatically different from those in the industrial age and require strategies that address these new learning needs. Designers of instruction within higher education have been challenged in many studies and articles to determine ways to address how the current academic system can be transformed to serve these changing educational needs. The themes derived from this study and the statements from which the themes were derived indicate achievements by this team of experts in addressing needs identified by learning theorists, futurists, and leaders in education nationwide. The statements provided by the panel in this study indicate awareness that today’s learners require learning activities and strategies that relate to the information-rich, global society in which they live. Survey results will extend the body of knowledge for course designers when determining strategies for incorporating social networking applications into the design of courses and provide indicators that may be used as evidence of learning.
REFERENCES


Holcomb, L., Brady, K., & Smith, B. (2010). The emergence of “educational networking”: Can non-commercial, education-based social networking sites really address the privacy and safety concerns of educators? *Journal of Online Learning and Teaching, 6*(2), 475–481.


Kop, R. (2011). The challenges to connectivist learning on open online networks: Learning experiences during a massive open online course. The International Review of Research in Open and Distance Learning, 12(3), 19–37.


APPENDIX A. ROUND 1 SURVEY

Below are the research questions used in Round 1 of the study.

<table>
<thead>
<tr>
<th>Survey Question</th>
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<tbody>
<tr>
<td>1. What first lead to your decision to integrate social networking into your course designs?</td>
</tr>
<tr>
<td>2. Did you eliminate another activity or assignment from your course design in order to integrate social networking? If so, how did you decide what to remove from your course? Is social networking required or optional?</td>
</tr>
<tr>
<td>3. What instructional strategies do you use to connect instruction and learning using social networking applications in your courses? Describe at least one strategy in detail.</td>
</tr>
<tr>
<td>4. Related to your response to the previous question, what occurred that indicated success (e.g., an increase in student participation in learning activities, more informed responses to posts in discussion boards, students indicated that it helped their learning or increased their test scores, etc.)?</td>
</tr>
<tr>
<td>5. What learning theories (e.g., behaviorism, cognitivism, constructivism, connectivism) guide your decisions to include social networking opportunities in your design of online instruction? Why?</td>
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<tr>
<td>6. List at least two ways you use social networking to link instruction and learning at the community college level.</td>
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<tr>
<td>7. List any evidence of learning that has occurred due to the connections (i.e., communication between learners) made during collaborative learning activities using social networking applications.</td>
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<tr>
<td>8. Based on your response to the previous question, could the same level of learning have occurred using other communication methods (e.g., asynchronous discussion boards)? Why?</td>
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<tr>
<td>9. List any evidence of learning due to learning activities using social networking applications not listed previously.</td>
</tr>
<tr>
<td>10. If applicable, provide at least one example of “poor” use of social networking in online course design. Why do you think it did not work?</td>
</tr>
<tr>
<td>11. If applicable, provide at least one example of “exemplary” use of social networking in online course design. Why do you think it was exemplary?</td>
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Survey ©Gloria J. Nobles, 2011
APPENDIX B. ROUND 2 SURVEY

Welcome to Round 2. This survey contains consolidated responses from the analysis of Round 1. Please review these responses and indicate the choice that best describes your opinion using the scale provided. Space has been included at the end of the survey for any questions or comments.

Please Note:
A. The statements have been grouped into themes (e.g., Communication, Experimentation) shown as page headings.
B. Social networking sites (or software/apps) will be referred to as “SNSs” in the statements that follow.

Click Next to begin the survey.

COMMUNICATION: Designers of instruction may incorporate SNSs to enhance the teaching and learning process by...

1. Integrating SNSs so they represent a different way of communicating rather than as additional coursework.
   - Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

2. Replacing one medium normally used (e.g., Elluminate) with another (e.g., Second Life) while maintaining same course content.
   - Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

3. Requiring students to post content they created to SNSs approved by instructor (e.g., blogs).
   - Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

4. Providing students with collaborative activities via SNSs with students in other classes (locally or globally) to complete group projects whenever possible or relevant to desired student learning outcomes.
   - Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

5. Using SNSs to keep students updated (e.g., using Facebook) on upcoming events and breaking news items relevant to course content and topics.
   - Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

6. Using SNSs for discussion purposes.
   - Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
7. Using SNSs rather than course management discussion boards for class participation.  
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

8. Requiring students to collaborate on assignments.  
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

9. Using SNSs to hold virtual office hours.  
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

10. Using SNSs to allow interaction between selected former and current students (i.e., Facebook “friends”).  
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

11. Creating assignments that require students to engage in social networking in order to complete them (e.g., specific questions requiring that they listen [if possible] to a podcast [closely adhering to the guidelines established by the Americans with Disabilities Act (ADA) for individuals with disabilities].  
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

12. Providing opportunities for students to continue communicating with instructor and class via SNSs after completion of course (or graduation).  
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

**EXPERIMENTATION:** Designers of instruction may incorporate SNSs to enhance the teaching and learning process by...

13. Eliminating some course content to allow adequate time for experimentation with SNSs.  
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

14. Allowing students to investigate, organize and lead virtual field trips (using SNSs) to locations integral to a class assignment.  
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

15. Allowing students to replicate real-world environments and events and collaborate virtually on topics related to assignments.  
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

16. Using SNSs in ways that allow students to demonstrate and apply concepts learned.  
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
17. Including student-created videos (developed with SNSs) in lectures as learning tools.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

18. Including both academic and non-academic wiki collaborative group projects as assignments.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

19. Allowing students freedom to introduce new SNSs in class and allowing flexibility in how the SNSs are used.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

20. Encouraging the global use of SNSs by including collaborative assignments with students in other countries.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

21. Making the use of SNSs an optional component of the class for the benefit of those uncomfortable or not interested in SNSs.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

22. Making the use of SNSs a required component of the class for the benefit of those who are comfortable and interested in SNSs.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

23. Including both optional and required activities that use SNSs.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

**DESIGN & IMPLEMENTATION:** Designers of instruction may incorporate SNSs to enhance the teaching and learning process by...

24. Requiring students to design and implement blogs.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

25. Feeding guiding questions to wikis to encourage discussions, design and collaboration.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

26. Sharing media among students that they find enjoyable, engaging and enlightening.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

27. Designing assignments around certain blog posts.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*
28. Guiding the use of SNSs by setting limits (i.e., moderating Facebook interaction, curating content and limiting podcast time).

   *Strongly Agree*   *Agree*   *Neutral*   *Disagree*   *Strongly Disagree*

29. Guiding students by modeling responsible use of SNSs.

   *Strongly Agree*   *Agree*   *Neutral*   *Disagree*   *Strongly Disagree*

INTERACTING: Designers of instruction may incorporate SNSs to enhance the teaching and learning process by...

30. Requiring students to build wikis and interact with other class members via wikis.

   *Strongly Agree*   *Agree*   *Neutral*   *Disagree*   *Strongly Disagree*

31. Providing optional assignments where students may choose to interact with other class members via SNSs.

   *Strongly Agree*   *Agree*   *Neutral*   *Disagree*   *Strongly Disagree*

32. Identifying, linking and sharing relevant videos (e.g., YouTube) regularly.

   *Strongly Agree*   *Agree*   *Neutral*   *Disagree*   *Strongly Disagree*

33. Requiring students to develop group pages, upload videos (e.g., YouTube) and connect globally.

   *Strongly Agree*   *Agree*   *Neutral*   *Disagree*   *Strongly Disagree*

34. Posting links to articles (e.g., Facebook) and encouraging students to comment on them.

   *Strongly Agree*   *Agree*   *Neutral*   *Disagree*   *Strongly Disagree*

FEEDBACK & PARTICIPATION: Designers of instruction may incorporate SNSs to enhance the teaching and learning process by...

35. Allowing students to use SNSs during synchronous class sessions.

   *Strongly Agree*   *Agree*   *Neutral*   *Disagree*   *Strongly Disagree*

36. Using SNSs to allow students to invite their social peers into a class discussion for feedback and participation when deemed appropriate by instructor.

   *Strongly Agree*   *Agree*   *Neutral*   *Disagree*   *Strongly Disagree*

37. Using SNSs during synchronous interactions between instructor and students as a medium of feedback and participation (e.g., Twitter).

   *Strongly Agree*   *Agree*   *Neutral*   *Disagree*   *Strongly Disagree*
38. Allowing students to use SNSs as a portal to show their work to a larger audience for feedback or demonstration of their accomplishments.

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

EXTENDING KNOWLEDGE: Designers of instruction may incorporate SNSs to enhance the teaching and learning process by...

39. Requiring students to join online organizations related to course content that may introduce them to resources and outlets for lifelong connections and learning.

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

40. Encouraging students to join online organizations related to course content that may introduce them to resources and outlets for lifelong connections and learning.

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

41. Using SNSs to allow extended communication between the class and the public rather than using a private forum contained within the institution’s learning management system (i.e., local business representatives).

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

42. Using SNSs to create an environment where students are as comfortable working together online as they would be in a face-to-face class.

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

DEGREE OF RELEVANCE & INTEREST: Evidence or indicators of learning after social networking activities have been integrated…

43. Students’ comments and involvement in discussions have a higher degree of relevance and interest.

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

44. Questions posed to each other yield accurate answers with limited input from instructor.

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

45. Students produce better quality papers and projects than in classes without the use of SNSs.

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
46. Students create final projects that have more depth and demonstrate their understanding of concepts.

   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

47. More vigorous class discussion threads and interactions between students related to course topics.

   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

48. Discussions reveal levels of comprehension not revealed using other more commonly used discussion mediums (e.g., discussion boards).

   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

49. Students are able to demonstrate their understanding of concepts by creating shareable content like videos or podcasts.

   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

50. Students appear more motivated and involved in activities that include SNSs and, hence, gain more from the learning experience.

   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

51. Improved retention rates in classes that include social networking activities.

   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

52. Students expressed an interest in learning more about particular topics because of what they learned in class.

   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

53. An increase in the percentage of students who complete assignments by the due date.

   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

54. Anecdotal evidence from current and former students regarding positive effects SNSs had on their learning experience.

   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

55. Classroom discussions with students demonstrate a greater depth and breadth of knowledge and an awareness of new and emerging technologies.

   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

56. Students’ self-assessment on course evaluations indicate increased learning when SNSs have been used in class.

   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree
57. Students perform better on performance based assessments than prior to the use of SNSs.
   \( \text{Strongly Agree} \quad \text{Agree} \quad \text{Neutral} \quad \text{Disagree} \quad \text{Strongly Disagree} \)

58. Students are able to test their knowledge of a new concept (or new language) learned by communicating via SNSs with students who are well versed on that concept (or language).
   \( \text{Strongly Agree} \quad \text{Agree} \quad \text{Neutral} \quad \text{Disagree} \quad \text{Strongly Disagree} \)

59. Students are able to communicate and collaborate “live” globally on course topics with students locally and in other countries with confidence using SNSs.
   \( \text{Strongly Agree} \quad \text{Agree} \quad \text{Neutral} \quad \text{Disagree} \quad \text{Strongly Disagree} \)

**PARTICIPATION:** Evidence or indicators of learning after social networking activities have been integrated…

60. There is an increase in class participation in some activities when students use SNSs for communication.
   \( \text{Strongly Agree} \quad \text{Agree} \quad \text{Neutral} \quad \text{Disagree} \quad \text{Strongly Disagree} \)

61. There is more peer to peer collaboration that results in good final reports.
   \( \text{Strongly Agree} \quad \text{Agree} \quad \text{Neutral} \quad \text{Disagree} \quad \text{Strongly Disagree} \)

62. Increased scores on collaborative projects.
   \( \text{Strongly Agree} \quad \text{Agree} \quad \text{Neutral} \quad \text{Disagree} \quad \text{Strongly Disagree} \)

63. Voluntary attendance at online conferences introduced in class using SNSs.
   \( \text{Strongly Agree} \quad \text{Agree} \quad \text{Neutral} \quad \text{Disagree} \quad \text{Strongly Disagree} \)

64. Increased participation by students in professional or organizational blogs that relate to course.
   \( \text{Strongly Agree} \quad \text{Agree} \quad \text{Neutral} \quad \text{Disagree} \quad \text{Strongly Disagree} \)

65. Increased participation in collaborative activities (whether required or optional).
   \( \text{Strongly Agree} \quad \text{Agree} \quad \text{Neutral} \quad \text{Disagree} \quad \text{Strongly Disagree} \)


**PERFORM RESEARCH:** Evidence or indicators of learning after social networking activities have been integrated…

66. Students are able to perform research on their own using SNSs.
   
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

67. Students indicate learning by using SNSs to find solutions to course related problems not contained in textbook.
   
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

**EMPLOYMENT:** Evidence or indicators of learning after social networking activities have been integrated…

68. Students report finding employment at least partially due to connections made while using SNSs in addition to concepts learned.
   
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

69. Students use knowledge gained to start or build a business (e.g., student in a web design class acquiring web design contracts because of exposure gained in displaying/publishing assignments created.)
   
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

70. Feedback from graduates via SNSs (e.g., LinkedIn) indicated learning via class assignments that included the use of SNSs.
   
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

**COMMENTS:** Use this area to add any comments or questions regarding the statements above.

Survey ©Gloria J. Nobles, 2011
APPENDIX C. ROUND 3 SURVEY

Round 3—Social Networking Survey

Welcome to Round 3 which is the FINAL round for this study. The results from Round 2 were analyzed to determine consensus of the panel. Those statements that did not reach consensus are included in this FINAL round.

Please review these statements and indicate the choice that best describes your opinion using the scale provided. Space has been included at the end of the survey for any questions or comments.

As in the previous round:

A. The statements have been grouped into themes (e.g., Communication, Experimentation) shown as page headings.
B. Social networking sites (or software/apps) will be referred to as “SNSs” in the statements that follow.

Click Next to begin the survey.

COMMUNICATION: Designers of instruction may incorporate SNSs to enhance the teaching and learning process by...

1. Integrating SNSs so they represent a different way of communicating rather than as additional coursework.
   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

2. Using SNSs to allow interaction between selected former and current students (i.e., Facebook “friends”).
   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

3. Creating assignments that require students to engage in social networking in order to complete them (e.g., specific questions requiring that they listen [if possible] to a podcast closely adhering to the guidelines established by the Americans with Disabilities Act (ADA) for individuals with disabilities).
   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree

4. Using SNSs for discussion purposes.
   Strongly Agree   Agree   Neutral   Disagree   Strongly Disagree
EXPERIMENTATION: Designers of instruction may incorporate SNSs to enhance the teaching and learning process by...

5. Eliminating some course content to allow adequate time for experimentation with SNSs.  
   Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

6. Allowing students to investigate, organize and lead virtual field trips (using SNSs) to locations integral to a class assignment.  
   Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

7. Allowing students to replicate real-world environments and events and collaborate virtually on topics related to assignments.  
   Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

8. Allowing students freedom to introduce new SNSs in class and allowing flexibility in how the SNSs are used.  
   Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

9. Encouraging the global use of SNSs by including collaborative assignments with students in other countries.  
   Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

10. Making the use of SNSs an optional component of the class for the benefit of those uncomfortable or not interested in SNSs.  
    Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

11. Making the use of SNSs a required component of the class for the benefit of those who are comfortable and interested in SNSs.  
    Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

12. Including both optional and required activities that use SNSs.  
    Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

DESIGN & IMPLEMENTATION: Designers of instruction may incorporate SNSs to enhance the teaching and learning process by...

13. Requiring students to design and implement blogs.  
    Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

14. Guiding the use of SNSs by setting limits (i.e., moderating Facebook interaction, curating content and limiting podcast time).  
    Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree
INTERACTING: Designers of instruction may incorporate SNSs to enhance the teaching and learning process by...

15. Requiring students to build wikis and interact with other class members via wikis.
   
   *Strongly Agree*    *Agree*    *Neutral*    *Disagree*    *Strongly Disagree*

16. Providing optional assignments where students may choose to interact with other class members via SNSs.
   
   *Strongly Agree*    *Agree*    *Neutral*    *Disagree*    *Strongly Disagree*

17. Requiring students to develop group pages, upload videos (e.g., YouTube) and connect globally.
   
   *Strongly Agree*    *Agree*    *Neutral*    *Disagree*    *Strongly Disagree*

FEEDBACK & PARTICIPATION: Designers of instruction may incorporate SNSs to enhance the teaching and learning process by...

18. Using SNSs to allow students to invite their social peers into a class discussion for feedback and participation when deemed appropriate by instructor.
   
   *Strongly Agree*    *Agree*    *Neutral*    *Disagree*    *Strongly Disagree*

EXTENDING KNOWLEDGE: Designers of instruction may incorporate SNSs to enhance the teaching and learning process by...

19. Requiring students to join online organizations related to course content that may introduce them to resources and outlets for lifelong connections and learning.
   
   *Strongly Agree*    *Agree*    *Neutral*    *Disagree*    *Strongly Disagree*

20. Using SNSs to allow extended communication between the class and the public rather than using a private forum contained within the institution’s learning management system (i.e., local business representatives).
   
   *Strongly Agree*    *Agree*    *Neutral*    *Disagree*    *Strongly Disagree*
DEGREE OF RELEVANCE & INTEREST: Evidence or indicators of learning after social networking activities have been integrated…

21. Students produce better quality papers and projects than in classes without the use of SNSs.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

22. Discussions reveal levels of comprehension not revealed using other more commonly used discussion mediums (e.g., discussion boards).
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

23. Students are able to demonstrate their understanding of concepts by creating shareable content like videos or podcasts.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

24. Students appear more motivated and involved in activities that include SNSs and, hence, gain more from the learning experience.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

25. Improved retention rates in classes that include social networking activities.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

26. Students expressed an interest in learning more about particular topics because of what they learned in class.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

27. Anecdotal evidence from current and former students regarding positive effects SNSs had on their learning experience.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

28. Students’ self-assessment on course evaluations indicate increased learning when SNSs have been used in class.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

29. Students are able to test their knowledge of a new concept (or new language) learned by communicating via SNSs with students who are well versed on that concept (or language).
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*

30. Students are able to communicate and collaborate “live” globally on course topics with students locally and in other countries with confidence using SNSs.
   *Strongly Agree*  *Agree*  *Neutral*  *Disagree*  *Strongly Disagree*
PARTICIPATION: Evidence or indicators of learning after social networking activities have been integrated…

31. Increased scores on collaborative projects.
   \begin{tabular}{cccccc}
   Strongly Agree & Agree & Neutral & Disagree & Strongly Disagree \\
   \end{tabular}

32. Voluntary attendance at online conferences introduced in class using SNSs.
   \begin{tabular}{cccccc}
   Strongly Agree & Agree & Neutral & Disagree & Strongly Disagree \\
   \end{tabular}

EMPLOYMENT: Evidence or indicators of learning after social networking activities have been integrated…

33. Students indicate using knowledge gained to start or build a business (e.g., student in a web design class acquiring web design contracts because of exposure gained in displaying/publishing assignments created.)
   \begin{tabular}{cccccc}
   Strongly Agree & Agree & Neutral & Disagree & Strongly Disagree \\
   \end{tabular}

34. Feedback from graduates via SNSs (e.g., LinkedIn) indicated learning via class assignments that included the use of SNSs.
   \begin{tabular}{cccccc}
   Strongly Agree & Agree & Neutral & Disagree & Strongly Disagree \\
   \end{tabular}

COMMENTS: Use this area to add any comments or questions regarding the statements above.

Survey ©Gloria J. Nobles, 2011
APPENDIX D. CONSENSUS REACHED ON RESEARCH QUESTION 1:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Designers of instruction incorporate SNSs to enhance the teaching and learning process by</th>
<th>Level of Agreement (Percentage)</th>
</tr>
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<td>Communication</td>
<td>Integrating SNSs so they represent a different way of communicating rather than as additional coursework.</td>
<td>93.3</td>
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<td>Replacing one medium normally used (e.g., Elluminate) with another (e.g., Second Life) while maintaining same course content.****</td>
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<td></td>
<td>Providing students with collaborative activities via SNSs with students in other classes (locally or globally) to complete group projects whenever possible or relevant to desired student learning outcomes. ****</td>
<td>86.7</td>
</tr>
<tr>
<td></td>
<td>Using SNSs to hold virtual office hours. ****</td>
<td>86.7</td>
</tr>
<tr>
<td></td>
<td>Using SNSs to keep students updated (e.g., using Facebook) on upcoming events and breaking news items relevant to course content and topics.</td>
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<td>Creating assignments that require students to engage in social networking in order to complete them (e.g., specific questions requiring that they listen [if possible] to a podcast [closely adhering to the guidelines established by the Americans with Disabilities Act (ADA) for individuals with disabilities].</td>
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<td>Using SNSs for discussion purposes.</td>
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<td></td>
<td>Using SNSs rather than course management discussion boards for class participation.****</td>
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</tr>
<tr>
<td></td>
<td>Requiring students to collaborate on assignments. ****</td>
<td>80.0</td>
</tr>
<tr>
<td></td>
<td>Providing opportunities for students to continue communicating with instructor and class via SNSs after completion of course (or graduation).</td>
<td>80.0</td>
</tr>
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<td></td>
<td>Requiring students to post content they created to SNSs approved by instructor (e.g., blogs). ****</td>
<td>80.0</td>
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<td>Experimentation</td>
<td>Using SNSs in ways that allow students to demonstrate and apply concepts learned.</td>
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<td></td>
<td>Including student-created videos (developed with SNSs) in lectures as learning tools.</td>
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</tr>
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<td>Making the use of SNSs an optional component of the class for the benefit of those uncomfortable or not interested in SNSs.*</td>
<td>80.0</td>
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<tr>
<td>Design and Implementation</td>
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<td>Guiding students by modeling responsible use of SNSs.</td>
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<td>Feedback and Participation</td>
<td>Extending Knowledge</td>
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<tr>
<td>Guiding the use of SNSs by setting limits (i.e., moderating Facebook interaction, curating content and limiting podcast time).</td>
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<td>Providing optional assignments where students may choose to interact with other class members via SNSs.</td>
<td>Requiring students to join online organizations related to course content that may introduce them to resources and outlets for lifelong connections and learning.</td>
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</tr>
<tr>
<td>Allowing students to use SNSs during synchronous class sessions.</td>
<td>Using SNSs to allow extended communication between the class and the public rather than using a private forum contained within the institution’s learning management system (i.e., local business representatives).</td>
<td></td>
</tr>
<tr>
<td>Allowing students to use SNSs as a portal to show their work to a larger audience for feedback or demonstration of their accomplishments.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using SNSs during synchronous interactions between instructor and students as a medium of feedback and participation (e.g., Twitter).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using SNSs to allow students to invite their social peers into a class discussion for feedback and participation when deemed appropriate by instructor.**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Although statement reached consensus, agreement did not indicate advocacy. Category combinations are *Strongly Agree (SA) and Disagree (D). **Agree (A) and Disagree (D). ****Agree (A) and Neutral (N).
### APPENDIX E. CONSENSUS REACHED ON RESEARCH QUESTION 2:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Evidence or indicators of learning after social networking activities have been integrated</th>
<th>Level of Agreement (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Degree of Relevance and Interest</strong></td>
<td>An increase in the percentage of students who complete assignments by the due date. ****</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Improved retention rates in classes that include social networking activities.</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>There is more peer to peer collaboration that results in quality final reports. ****</td>
<td>93.4</td>
</tr>
<tr>
<td></td>
<td>Students expressed an interest in learning more about particular topics because of what they learned in class when using SNSs.</td>
<td>93.3</td>
</tr>
<tr>
<td></td>
<td>Voluntary attendance at online conferences introduced in class using SNSs. ****</td>
<td>93.3</td>
</tr>
<tr>
<td></td>
<td>Students’ comments and involvement in discussions have a higher degree of relevance and interest.</td>
<td>92.9</td>
</tr>
<tr>
<td></td>
<td>Classroom discussions with students demonstrate a greater depth and breadth of knowledge and an awareness of new and emerging technologies.</td>
<td>92.9</td>
</tr>
<tr>
<td></td>
<td>Questions posed to each other yield accurate answers with limited input from instructor. ****</td>
<td>92.8</td>
</tr>
<tr>
<td></td>
<td>More vigorous class discussion threads and interactions between students related to course topics.</td>
<td>92.8</td>
</tr>
<tr>
<td></td>
<td>Students indicate using knowledge gained to start or build a business (e.g., student in a web design class acquiring web design contracts due to exposure gained in displaying or publishing assignments created online). ****</td>
<td>86.6</td>
</tr>
<tr>
<td>Students are able to test their knowledge of a new concept (or new language) learned by communicating via SNSs with students who are well versed on that concept (or language). ****</td>
<td>86.6</td>
<td></td>
</tr>
<tr>
<td>---</td>
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<td></td>
</tr>
<tr>
<td>Students create final projects that have more depth and demonstrate their understanding of concepts. ****</td>
<td>85.7</td>
<td></td>
</tr>
<tr>
<td>Increased participation by students in professional or organizational blogs that relate to course. ****</td>
<td>84.6</td>
<td></td>
</tr>
<tr>
<td>Students perform better on performance based assessments than prior to the use of SNSs. ****</td>
<td>84.6</td>
<td></td>
</tr>
<tr>
<td>Students are able to demonstrate their understanding of concepts by creating shareable content like videos or podcasts.</td>
<td>82.4</td>
<td></td>
</tr>
<tr>
<td>Discussions reveal levels of comprehension not revealed using other more commonly used discussion mediums (e.g., discussion boards).</td>
<td>81.7</td>
<td></td>
</tr>
<tr>
<td>Students are able to communicate and collaborate “live” globally on course topics with students locally and in other countries with confidence using SNSs. ****</td>
<td>80.0</td>
<td></td>
</tr>
<tr>
<td>Anecdotal evidence from current and former students regarding positive effects SNSs had on their learning experience.</td>
<td>80.0</td>
<td></td>
</tr>
<tr>
<td>Students produce better quality papers and projects than in classes without the use of SNSs.***</td>
<td>80.0</td>
<td></td>
</tr>
<tr>
<td>Participation</td>
<td>There is an increase in class participation in some activities when students use SNSs for communication.</td>
<td>92.9</td>
</tr>
<tr>
<td></td>
<td>Increased participation in collaborative activities (whether required or optional).</td>
<td>85.7</td>
</tr>
<tr>
<td></td>
<td>Increased scores on collaborative projects.</td>
<td>85.7</td>
</tr>
<tr>
<td>Perform Research</td>
<td>Students indicate learning by using SNSs to find solutions to course related problems not contained in textbook.</td>
<td>92.9</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td></td>
<td>Students are able to perform research on their own using SNSs.</td>
<td>85.7</td>
</tr>
<tr>
<td>Employment</td>
<td>Students report finding employment at least partially due to connections made while using SNSs in addition to concepts learned. ****</td>
<td>92.9</td>
</tr>
</tbody>
</table>

*Note: Although statement reached consensus, agreement did not indicate strong advocacy. Category combinations are ****Agree (A) and Neutral (N). ***Neutral (N) and Disagree (D).*