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Social Interactions Occurring during an Introductory College of Agriculture Course

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Social Interactions Occurring during an Introductory College of Agriculture Course

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Abstract

With the development of the internet, today's students no longer are confined to the resources only found in their classrooms or public libraries and have been given the ability to gain access to virtually unlimited quantities of information on the topics or events they are discussing in their class rooms and with their peers. The use of technology for communication and education is rapidly changing, but the challenges of technology-driven learning opportunities rest on questions of access and use. There is a need to determine whether students use these methods (i.e., technology based) to more prevalently communicate today. The primary purpose of study was to explore social interaction among DBCAFLS students at the University of Arkansas.

This study was an exploratory descriptive design using survey methodology. The purposive sample consisted of students enrolled a 1000 level course in the fall 2011 semester at the University of Arkansas. The six-question instrument was constructed as a matrix survey. The questions were designed to solicit the frequency in which each student interacted with each of their peers, by which methods they used to communicate, and for what reason their communication occurred.

Of the possible participants (N = 245), 114 contacted another student during the initial evaluation, 127 during the mid-semester evaluation and 133 during the final evaluation. The total contacts for each evaluation where 312 (initial), 392 (mid-semester), and 373 (final) which indicates that more contacts were made at mid-semester then lessened at the end of the course. Out of the possible participants (N = 245), on average 50% of the students in this course shared no contact with another student. Additionally, it indicated that students prefer face-to-face contact (n = 281) over other methods such as email, text messaging, instant messaging,

Facebook, and phone. Students self-reported a technology skill level of 3.63 which states that students feel that their proficiency level related to technology use is between average and above average. Of the participants (N = 245), 208 answered that they would indeed use technology access to aid in materials needed or additional materials offered for a course.

Acknowledgements

To start I would like to thank my chair, Dr. Don Edgar. Thank you for your commitment to my success. I know this hasn't been an easy road for me and I can't imagine the anxiety it has caused you. Thank you for your patience with me, your time dedicated to ensuring that I finished this, and always answering what seemed like a never ending pile of questions. Thank you to my committee members Dr. Kate Shoulders and Dr. Timothy Killian. Dr. Shoulders, I appreciate every edit down to the last comma. It sounds so much better now thanks to you diligent editing process. Thank you for making me think outside the box. Dr. Killian, thank you for allowing me utilize your course for my research. Thank you for reminding me to look at every side of a situation and using that information to write clearly. This thesis would have not been possible without all of you and I am forever grateful to have worked with you.

Also, I would like to thank Ms. Donna Graham. She has always worked with me to make sure that all my ducks were in the right row and that they were always moving forward.

Lastly, I would like to thank the entire department as a whole. You took in a girl from a small town in Southeast Arkansas and made the University of Arkansas feel like home. I will never forget the relationships formed during my time on campus. Every person played a part in my educational process and I am overjoyed to say that I received my teaching license and Master's degree under your careful guidance.

Dedication

I dedicate this thesis to my grandfather Thomas Linwood Dees, Sr. For the entirety of my life I have had the biggest support group. There were always never end amounts of love, guidance, forgiveness, and acceptance from God, family, and friends. As I completed my work towards this degree and this thesis, I often thought about the dedication and acknowledgement portions. I considered dedicating it to myself. This was something I did for me because my education is something that no one will ever be able to take from me. But instead of being selfish I realized that the entire process from high school until present day has been guided by one person, my papaw.

From a young age, papaw was always teaching me and I never realized the impact until I finished my coursework and started my career as an agricultural educator. He always took me to the farm, allowed me to help check the cows, follow him into the garden, and make wonderful adventures on our bicycles. Lord knows he gave my mammaw more small heart attacks than she will ever deserve by taking us on the adventures that he did.

I lost my grandfather in 2010. He never witnessed my graduation from college nor will he be there to celebrate this one. His presence may be missing, but the countless memories of adventure and lessons on agriculture and life will always be close to my heart. This one is for you papaw.

I would also like to thank my dad, David Dees, for always reminding me to follow my passion and get a job doing something I love. I know for a long time you aspired for me to be a doctor, or a lawyer but you never once faulted on my decision to follow my dream. I will never

forget the countless times you told me not be like you and find a job in the air conditioning, but I think I have found the best of both worlds.

Mammaw, you are the foundation that kept this family whole. You are my biggest supporter and my crucial critic. Thank you for always taking the time on me because without the endless lessons of manners, cleaning, cooking, and sewing, I could not be the woman I am today.

Lauren, you are my best friend and God has truly blessed me with the best sister in the world. You have always been there to keep me going with a smile and a great joke. Your laugh will always make me smile and I'm so proud to be your big sister.

Mom, you have always been a phone call away and for that I am forever grateful. Thank you for all the FFA trips you chaperoned, the endless days spent in a fair bar, and driving me around to every function.

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To the rest of my family and my friends, thank you for the endless amount of love and support. My possibilities in life are endless and always have been because of the comfort and support you have shown me.

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CHAPTER I

INTRODUCTION

Need for the study

Numerous advances occur almost daily toward technology. One of the most important of those advances was likely the creation of the internet. Of the seven billion people living in the world, approximately four billion use the internet ("World Internet Users Statistics Usage and World Population Stats", 2018). With the development of the internet, today's students no longer are confined to the resources only found in their classrooms or public libraries and have been given the ability to gain access to virtually unlimited quantities of information on the topics or events they are discussing in their class rooms and with their peers. ("Information Technology", 2017).

The first recognizable social network site was launched in 1997 and was titled SixDegrees.com (Boyd & Ellison, 2008). Online social networks have become the popular way for users to connect and share information; and the popular social networks have hundreds of millions of users constantly growing at a rapid rate (Viswanath, Mislove, Cha, & Gummadi, 2009). Social networking sites have grown to such a great phenomenon that sites such as Facebook had 2.20 billion monthly active users as of March 2018 (Facebook Newsroom Company Info Stats, 2018).

Along with the growth of social interaction technology, the mobile phone has now moved beyond being a mere technical device to becoming a key "social object" present in every aspect of a user's life (Srivastava, 2005, p.11). With a large amount of companies that sell various types and sizes of these mobile devices, this market is an international phenomenon. Mobile phones allow users to construct their own "at-home" environment, regardless of where they find

themselves in physical space (Srivastava, 2005, p. 12). These advancements in mobile technology now allow us to communicate in more than just one way with each other. Text messaging is standard on most mobile devices and has drastically changed the way people speak and write (Faulkner & Culwin, 2005). Most have the option to allow set-up for email accounts for anywhere and anytime access. They also allow for easy access to many social networking sites (Facebook, Twitter, etc.). Along with the bonuses of mobile phones, they do allow for traditional phone conversation.

With advances in technology occuring all the time, the way people share information is changing as well (Leidner & Jarvenpaa, 1995). It is important for educators to know how their students are communicating about classwork. If educators could answer the questions of who, how, what, and when students communicate, they could effectively adjust their teaching methods, which could improve the way information is shared about classwork to enhance learning.

Coinciding with the advances in technology, learners and how they learn are changing. Today's learners gain information through an active process where they build understanding and make sense of information (Woolfolk, 2010), which is a theory not about teaching, but of how learners learn (Fosnot, 1996). Some learners focus on using a cognitive approach while others use interactions with peers to impact their knowledge construction. Those students who are interacting socially may process and use information more efficiently than those using only the cognitive approach (Fosnot, 1996).

With the importance of social interaction and focusing on the idea that students make connections with peers, this may ultimately affect their behavior and change the way they learn (Bandura, 1969). If the change is occurring in the way learners learn and it is due to their social

interaction, guidelines to aid in teaching can be used such as described by Chickering and Gamson (1999). Their principles are:

- Encourage student-faculty contact
- Encourage cooperation among students
- Encourage active learning
- Give prompt feedback
- Emphasize time on task
- Communicate high expectations
- Respects diverse talents and ways of learning (p.76)

These principles encourage learner-to-learner interaction among members of a class or group and can be extremely valuable for learning and in most cases are essential (Moore, 1989).

Social networks are formed when individuals share a connection about a common topic through some type of communication. In order to explore communication among members of a network, we must ask questions that elicit social network data and address the overall question: "Who talks to whom about what?" We already know that communities are not built on instrumental relations alone; therefore, to tap into both learning and community relations, it is important to ask questions that explore both task-oriented and socially oriented relations. Social network questions are phrased to gather data on each person's interactions with others in the group (for whole network data) or each person's interactions with others that they name (ego-centric network data) (Renninger & Shumar, 2002).

In order to trace, map, or analyze the social interactions occurring between individuals, a network analysis can be completed. This type of analysis is a method used within the social sciences for exploring human and social dynamics by determining economic and political

relationships between people and between organizations (Gomm, 2009). A social network can be seen visibly on social network sites which are used as web-based services that allow users to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system (Boyd & Ellison, 2008). Social Network Sites (SNS) are platforms that allow users to articulate and make visible their social networks (Roberts, Murphy & Edgar, 2010). These sites may be used as part of a person's daily practice but, for what purpose are the users using SNS?

According to Wasserman and Faust (1994), "Social network and the methods of social network analysis have attracted considerable interest and curiosity from the social and behavioral science community in recent decades" (p. 3). Social network analysis methods were designed for the analysis of social structures and specifically geared toward an investigation of the relational aspects of those structures (Scott, 1991). Social network methodology is based on three areas including empirical, theoretical, and mathematical motivations (Wasserman and Faust, 1994).

Findings associated with this study provided the researchers with valuable information for the future. Concluding a basic understanding of students' social networks will aid in creating and implementing preferred technologies for educational purposes. With these updates to the way educators develop and communicate educational information, educators will be able to reach students more effectively about important classroom decisions and information.

Statement of the Problem

Are educators effectively communicating to students about classwork at the post-secondary level? The use of technology for communication and education is rapidly changing,

but the challenges of technology-driven learning opportunities rest on questions of access and use (Collins, Gee, & Halverson, 2018).There is a need to determine whether students use these methods (i.e., technology based) to more prevalently communicate today.

Terms and Definitions

DBCAFLS- Dale Bumper's College of Agricultural Food and Life Sciences; a college at the University of Arkansas:

Key Players- students sought out by their peers for one or more purposes; also described as central players:

Social Network-individuals that share a connection about a common topic through some type of communication:

Social Network Sites- web-based services that allow individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system (Boyd & Ellison, 2008):

Students in DBCAFLS- students included in a college that is part of the University of Arkansas which houses eleven departments including Agricultural and Extension Education, Agricultural Economics and Agribusiness, Animal Science, Biological and Agricultural Engineering, Crop, Soil, and Environmental Sciences, Entomology, Food Science, Horticulture, Plant Pathology, Poultry Science, and School of Human Environmental Sciences:

Assumptions

1. All students were honest and answered questions on the instrument to the best of their ability.
2. Students selected as the sample population are representative of the target population.

Limitations

1. There will be students that choose not to participate in the study.
2. Funds and time constraints prevented the study to reach the target population.

CHAPTER II

REVIEW OF LITERATURE

Introduction

With the development of the internet, today's students no longer are confined to the resources only found in their classrooms or public libraries and have been given the ability to gain access to virtually unlimited quantities of information on the topics or events they are discussing in their class rooms and with their peers. ("Information Technology", 2017).With advances in technology occurring all the time, the way people share information is changing as well (Leidner & Jarvenpaa, 1995). The invention of the smart phone allows users to construct their "at-home"environment, regardless of where they find themselves in a physical space (Srivastava, 2005, pg. 12). These advancements in technology now allow users to communicate in more than just one way with each other. In addition, today's learners gain information through an active process where they build understanding and make sense of information (Woolfolk, 2010). Some learners focus on using a cognitive approach, while other use interactions with peers to impact their knowledge construction. Their social interactions allow them to opportunity to learn cooperatively, derive a personal meaning about the topic, and clarify misunderstandings.

Constructivism

The theoretical foundation for this study is based on the theory of constructivism. Constructivism is defined as a view that emphasizes the active role of the learner in building understanding and making sense of information (Woolfolf, 2010**).** According to Doolittle and Camp (1999), constructivism is a theory of learning that has roots in both philosophy and psychology. This theory has roots that extend back to Piaget, Vygotsky, Dewey, Kolb, Glasersfeld, and many other philosophers.

For over three-quarters of a century, the implicit learning theory underlying the curriculum and pedagogy of career technical education has been behaviorism, but the emerging theory of constructivism may have implications for career and technical education practice in the future (Doolittle & Camp, 1999). In a field where career and technical education practices are taught to train future teachers on the subjects at hand, constructivism is a way to that learners can actively construct their own knowledge and meaning from their experiences. Learning from this perspective is viewed as a self-regulatory process of struggling with the conflict between existing personal models of the world and discrepant new insights, constructing new representations and models of reality as a human meaning-making venture with culturally developed tools and symbols, and further negotiating such meaning through cooperative social activity, discourse, and debate (Fosnot, 1996). This knowledge process relies on personal experiences to clarify a reality that may not be understood without it. According to Fosnot (1996), a constructivist view of learning suggests an approach to teaching that gives learners the opportunity for concrete, contextually meaningful experiences through which they can search for patterns, raise their own questions, and construct their own models, concepts, and strategies.

Constructivism is not a theory of teaching, but instead of learning (Fosnot, 1996). In general, students need interactions with peers and personal experiences to make meaning of the material to be learned. The following general principles of learning derived from constructivism aid in understanding the theory of constructivism and the importance of incorporating the theory to aid in student growth (Fosnot, 1996):

- Learning it not the result of development; learning *is* development.
- Disequilibrium facilitates learning.
- Reflective abstraction is the driving force of learning.

- Dialogue within a community engenders further thinking.

Differences of Constructivism

According to Doolittle and Camp (1999), constructivism is not a unitary theoretical position; rather, it is frequently described as a continuum and that the assumptions that underlie this continuum vary along several dimensions and have resulted in the definition and support for multiple types of constructivism. These types include cognitive, radical, and social constructivism. In cognitive constructivism, ideas are constructed in individuals through a personal process (Kalina & Powell, 2009). On the other hand, radical constructivism is concerned with the construction of mental structures, the position of cognitive constructivists, and the construction of personal meaning. Social constructivism is concerned with the point that knowledge is social in nature, the belief of knowledge is the result of social interaction, and that knowledge is a shared rather than an individual experience (Doolittle & Camp, 1999). Social constructivism uses social interactions to clarify where the knowledge resulted from. Understanding the details of these social interactions could result in viable information to be used for the purpose of altering or adopting new experiences for the learning process. Therefore, social constructivism was chosen as the specific theory to guide this study to examine and better understand these interactions.

Teaching can be classified as a social experience due to interactions between students and their teachers and peers. According to Bandura (1969), it is evident from informal observation that the complex repertoires of behavior displayed by members of society are to a large extent acquired with little or no direct tuition through observation of response patterns exemplified by various socialization agents. These social interactions affect behavior in students.

Importance of Social Interaction

Social interaction is important (Leidner & Jarvenpaa, 1995). The importance of social interaction in learning derives from Bandura (1969) and his idea that social interactions affect behavior. Vygotsky (1978) also acknowledged the importance of social interaction when he stated, "every function in the child's cultural development appears twice; first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological)" (p.57) (As cited in Roberts, et al, 2010). In order to incorporate social interaction into the learning process, the questions of how students relate socially in today's society must be answered. Other supporting information to the idea that social interactions are important are the seven principles of good practice in undergraduate education listed below (Chickering & Gamson, 1987; 1999).

- Encourages student-faculty contact;
- Encourages cooperation among students;
- Encourages active learning;
- Emphasizes time on task;
- Communicates high expectations; and
- Respects diverse talents and ways of learning

These principles encourage learner to learner interaction. Learner-learner interaction among members of a class or other group can be an extremely valuable resource for learning and is sometimes even essential (Moore, 1989). This study will aid in determining if this type of interaction is essential.

Social Network Analysis (SNA)

Social network analysis is tracing, mapping, and analyzing social, economic and political relationships between people and between organizations (Gomm, 2009). This type of analysis is one popular method being used within the social sciences for exploring human and social dynamics. From the mid-1930s, social network analysis progressed slowly and linearly until the end of the century when advancements such as sociometry, graph theory, and subgroups made their appearances and were quickly adopted by the relatively small number of "network analysts" (Carrington, Scott, & Wasserman, 2005). "Social network analysis provides a precise way to define important social concepts, a theoretical alternative to the assumptions of independent social actors, and a framework for testing theories about structured social relationships" (Wasserman & Faust, 1994, p.17).

Social Network Sites (SNS)

Boyd and Ellison (2008) defined social network sites as web-based services that allow individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system. They further mention that since their introduction, social network sites such as MySpace, Facebook, Cyworld, and Bebo have attracted millions of users, many of whom have integrated these sites into their daily practices. They also describe that the first recognizable social network site was launched in 1997 and since 2003 onward, many new SNSs were launched, promoting social software. Research has shown that these sites are a part of a person's daily practice with 95% of those ages 12-17 using the internet and eight in ten online teens using social media sites (Madden, et al, 2013). Social Network Sites (SNS) are platforms that allow users to articulate and make visible their social networks (Roberts, et al

2010). The networks initially formed on these sites between users are without a doubt already made connections with current offline peers. As stated in *Teens, Social Media, and Privacy,* "Facebook friendship networks largely mirror their offffline networks" (Madden, M., et al, 2013). Users are more interested in communicating with people that are already in their social network, rather than branching out to a new group of unknown peers. In 1916, John Dewey recognized the importance of communication and its ties with learning when he stated the following,

> Not only is social life identical with communication, but all communication (and hence all genuine social life) is educative. To be a recipient of a communication is to have an enlarged and changed experience. One shares in what another has thought and felt an in so far, meagerly or amply, has his own attitude modified. Nor is the one who communicates left unaffected. (p. 6)

Social Network

A social network was defined as individuals that share a connection about a common topic through some type of communication. According to Renninger and Shumar in *Building Virtual Communities, Learning and Change in Cyberspace* (2002), relations tie two people- two nodes- in a network. It further states that when we connect all dots in the network by the relations maintained between them, we see a picture of the *whole network.* Sociograms are graph-like structures that were first used in 1934 and represented the relational interactions occurring (Wassermen & Faust, 1994). These graphs can distinguish who is communicating with whom and whether the entire class is in communication or just small sub-groups. Renninger and Shumar (2002), stated that characteristics such as the size of the personal network and the diversity of its members have important consequences for an individual's access to resources and support. Some schools have started building classroom facilities that incorporate new technology in hopes of improving the learning and teaching process (Leidner & Jarvenpaa, 1995). Therefore, the purpose of this study is undergirded by the statement "To explore communication among

members of a network, we must ask questions that elicit social network data and address the overall question: 'Who talks to whom about what?' " (Renninger & Shumar, 2002, p.169). Communities are not built on instrumental relations alone; therefore, to tap into both learning and community, it is important to ask questions that explore both task-oriented and socially oriented relations. Social network questions are phrased to gather data on each person's interactions with each other person in the group (for whole network data) or each person's interactions with others that they name (ego-centric network data) (Renninger & Shumar, 2002). The instrument for this studied was designed with the above quote in mind. By developing an instrument that meets these standards, our data will have a better explanation of the social interactions that occur.

Social Leaders

"Rogers asserted that in a social system (or network) that certain individuals emerge as opinion leaders; those others in the system look to for guidance. These individuals may be sought out for a single purpose (monomorphic) or multiple purposes (polymorphic)" (As cited in Roberts, et al, 2010). For the purpose of this study, *key players* will be used as the name for individuals emerging as opinion leaders. These key players are students sought out by their peers for one or more purposes. Renninger and Shumar (2002), further explain these individuals as *central players.* They further describe the social network star as an individual who occupies a key position in the dissemination of information from and to all members of the network. There may be only one key player or there could be many. Determining the number of key players, if any, and if over time they remain the same is important that could determine how information is spread throughout the network.

Development of Social Network Analysis

"Social network and the methods of social network analysis have attracted considerable interest and curiosity from the social and behavioral science community in recent decades (Wasserman &Faust, 1994, p. 3)." However, the development of present-day social network analysis dates back to the "gestalt" theory developed by Kohler in the late 1920's (Scott, 1991). According to Scott (1991), the following figure is the direct lineage of social network analysis:

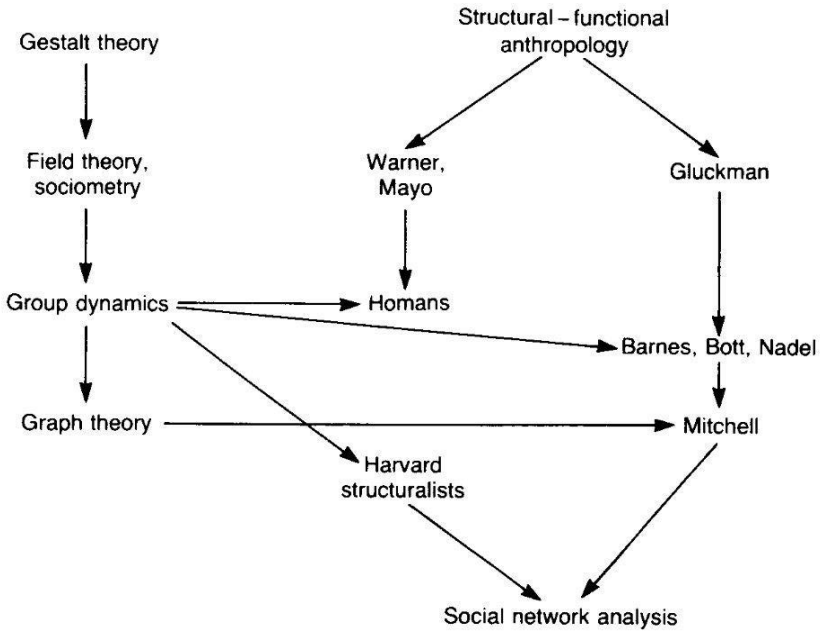

Figure 1. Direct lineage of social network. (Scott, 1991)

Due to the lineage of multiple researchers focusing and developing the standards of social network analysis, it is grounded in important social phenomena and theoretical concepts (Wasserman &Faust, 1994). Each area involves research done by each of the above researchers/theories that are included in the lineage shown above. According to Wasserman and Faust (1994), the measurements give rise to data that are unlike other social science data, therefore; an entire body of methods was developed for their analysis. Social network analysis

methods were designed for the analysis of social structures and specifically geared towards an investigation of the relational aspects of those structures (Scott, 1991). Social network methodology is based on three areas including empirical, theoretical, and mathematical motivations (Wasserman &Faust, 1994).

Summary

Moore (1989) stated that learner-to-learner interaction among members of a class or other group can be an extremely valuable resource for learning, and is sometimes even essential. Furthermore, technology affects the networks that are created from the interactions of learners (Thurmond, 2003). If additional understanding of social networks can be determined, it will aid in designing and using technology for educational learning purposes. Teacher educators who collaborate with, learn from, and make use of the knowledge created by these networks are helping to recreate the meaning of scholarship itself, not only for teachers, but for themselves as well (Lieberman, 2000).

Evaluating the above theories led to the purpose of study which was to explore social interaction among DBCAFLS students at the University of Arkansas. Research will be guided by the following research questions.

1. How do students in classrooms communicate with each other?
2. How do students in classrooms communicate to each other about class work?
3. What are the topics discussed between students?
4. How proficient are students at using technology?
5. Will students use technology to gain class information if provided?

Chapter III

METHODOLOGY

Purpose of Study and Research Questions

The purpose of this study was to explore social interaction among DBCAFLS students at the University of Arkansas. This study was guided by the following research questions:

1. How do students in classrooms communicate with each other?
2. How do students in classrooms communicate to each other about class work?
3. What are the topics discussed between students?
4. How proficient are students at using technology?
5. Will students use technology to gain class information if provided?

This chapter is divided into the following sections in order to report the research procedures used to accomplish the purpose of the study: (1) Design of the Study, (2) Subjects, (3) Instrumentation, (4) Data Collection Procedures, and (5) Analysis Plans.

Design of the Study

This study was an exploratory descriptive design using survey methodology. An exploratory design was chosen because it focused on a relatively unstudied subject. In survey research, investigators ask questions about peoples' beliefs, opinions, characteristics, and behavior (Ary, Jacobs, Razavieh & Sorensen, 2006). Also, survey research typically does not make causal inferences but rather describes the distributions of variables in a large group.

Subjects

The target population consisted of all students in the DBCAFLS. However, due to a time constraint and accessibility, a convenience sample was used. This sample included both male and female participants. The purposive sample included the number of students that were present,

participated, and completed instruments of the total class enrollment for each iteration of the instrument.

The sample consisted of students enrolled in the fall 2011 semester at the University of Arkansas. A 1000 level course was selected to represent the sample population based on the variety of student enrolled and degree programs they were seeking. The selected course is a course that falls under the University core elective course requirements and a diverse population of students normally enroll. Because the research is based on survey methodology, nonresponse error can be a serious problem; however, there are several ways to learn something about the characteristics of the non-respondents and the extent to which they might differ from the respondents (Ary, et al, 2006). Non-response error was calculated based on the number of students enrolled in the course (N = 245) and the number of students that were present, participated, and completed instruments. Respectfully, the first iteration resulted in 214 responses followed by 163 at the middle, and 177 in the final iteration. Response rates for each iteration were calculated at 87.35%, 66.53%, and 72.25%. Although the response rate for the middle iteration was lower than 70%, the nature of the research (descriptive) does not allow for generalizations to be made and should only be used to describe the respondents utilized in this convenience sample.

Instrumentation

A researcher-developed instrument was used to assess interaction between students. The instrument was developed through a review of literature and personal experiences of researchers. The six-question instrument was constructed as a matrix survey. First, students were asked to list up to six names of the students they interacted with in the class. These answers were used to answer the six questions below. The first two questions were designed to solicit the frequency in

which each student interacted with each of their peers: (a) On *average*, how often did you contact this student? and (b) On *average*, how often did this student teacher contact you? Participants were instructed to respond using an eight-point rating scale that ranged from 0 = "never", 1 = "very rarely" (once a month or less), 2 = "rarely" (2-3 times a month), 3 = "seldom" (4-5 times a month), 4 = "occasionally" (1-3 times a week), 5 = "moderately" (4-6 times a week), 6 = "frequently" (1-2 times a day), to 7 = "several times a day" (more than 2 times a day). (The third question instructed participants to indicate all the methods used in which they communicated with each peer. Options included: email, text messages, instant messaging, Facebook/MySpace, phone, and face-to-face. The fourth question sought to determine reason for which each participant communicated with each of their peers. Participants were instructed to check all that apply in the categories including venting/reflecting about class, planning/information related to class, and/or social/personal unrelated to class. These three options were deemed sufficient to cover the breadth of potential interactions and supported by the panel review of instrument (Roberts, et al, 2010).

Social networks found were examined through network analysis. In network analysis, *nodes* are points on a network and *edges* are connections (Edgar, Murphy, &Roberts, 2010). In this social network analysis, nodes are people, and edges are the interactions that have occurred between them. *KeyPlayer* is a software program for identifying an optimal set of nodes in a network for one of two basic purposes ("Key player 1.44," 1996). The two basic purposes coded into this software are functions called *Remove* and *Observe.* For this study, KeyPlayer's Observe function was employed. Observe has only one option titled *Reach* that is programmed to find the fewest number of nodes that reach the greatest number of others. Fewer key players are optimal, but are balanced against increasing the percentage of network nodes reached. It is possible that

some people may have a great number of connections; however, they reach very few other people because they all share the same, redundant, connections. By using the Observe function, the researchers were able to establish some limits for this analysis. To start each analysis, the number of steps, called *reach* in network analysis, were set to 1. A reach of 1 requires a direct link (interaction) between a key player and any other member (Roberts, Murphy & Edgar, 2010). If the number of steps is set to 2, the measure of reach becomes the number of distinct persons who are within two links (interactions) (e.g. a friend of a friend) of any member of the set of key players. For the overall network, the reach was increased to 6 to allow for the interactions, to find the key players that might exist between what were essentially six networks with different purposes. Based on the purpose of interaction, the researchers hypothesize that there may be distinct networks. These data are best viewed as three– dimensional Kinemages; however, they have been rendered into two–dimensional images for presentation in this thesis.

A research-developed instrument was used to assess interaction between student teachers (Roberts, et al, 2010). Through a review of literature and personal experience the instrument was developed (Roberts, et al, (2010). An expert panel of teacher educators not involved in the project reviewed the instrument to determine face and content validity, which was deemed valid. According to Dillman (2000), because the instrument asked for recall of past behaviors, it was believed that participants could accurately and reliable provide the requested data (As cited in Roberts, et al, 2010). The original instrument was pilot tested in 2010 by Roberts, Murphy & Edgar. In order to access the population of study, the instrument was reworded and formatted to be used with larger class sizes than the initial instrument. Minor wording and formatting was applied. As an example, instead of identifying (on a grid) of present classmates, students were

asked to identify students interacted with by name. The researcher identified through a provided class roster and substitute student ID numbers for data analysis.

Data Collection Procedures

The instrument and cover letter were given to the students enrolled in the Introductory Human and Environmental Sciences course. Data was collected at three points during the study. An initial observation was completed during the $1^{st}/2^{nd}$ weeks of class followed by a mid-semester data collection and finally an end data collection point. The researchers decided that determining the formation or presence of networks that may be present would explain the essence of the study. Each time, after instruments were administered to the students, they were given time complete the instrument that was collected when finished. According to *Introduction to Research Education* (2006), the advantages of directly administering questionnaires include low cost, high response rate, and the researcher present with only one disadvantage (the least of any data collection method) of no flexibility regarding to time and place.

Data Analysis

The completed instruments were checked by the researcher for incompleteness. All incomplete instruments were removed from the sample. Instrument responses were entered into a Microsoft Excel spreadsheet and coded for analysis. Data was entered into a Microsoft Excel spreadsheet and was checked for accuracy to ensure that responses were in the correct format for each item. Once data was checked, IBM SPSS 23 was used to analyze descriptive data in which measures of central tendency were found for collecting data. Key player was then employed to determine if networks were present and to the extent of reach found.

CHAPTER IV

RESULTS

The purpose of this study was to explore social interaction among DBCAFLS students at the University of Arkansas. This study was guided by the following research questions:

1. How do students in classrooms communicate with each other?
2. How do students in classrooms communicate to each other about class work?
3. What are the topics discussed between students?
4. How proficient are students at using technology?
5. Will students use technology to gain class information if provided?

Research Question One

Research question one was used to examine how students communicate with each other. The initial evaluation reported that of the possible participants (N = 245), only 114 participants contacted someone in the beginning and 103 contacts were made (see Figure 21). This initial contact shows that of the 114 who contacted someone there were 103 students that reciprocated the contact and that some students were duplicated contacts. The mid-semester evaluation did show an increase in those who contacted someone to 127 and 122 were contacted. The final evaluation showed that 133 students contacted someone and 131 were contacted. Those contacted in each evaluation were the initial contact of each student and they increased in amount of contact over the semester. The total contacts for each evaluation where 312 (initial), 392 (mid-semester), and 373 (final) which reports that more contacts were made at mid-semester then lessened towards the end. Overall, from beginning to end students made more contact to other students (see Table 1).

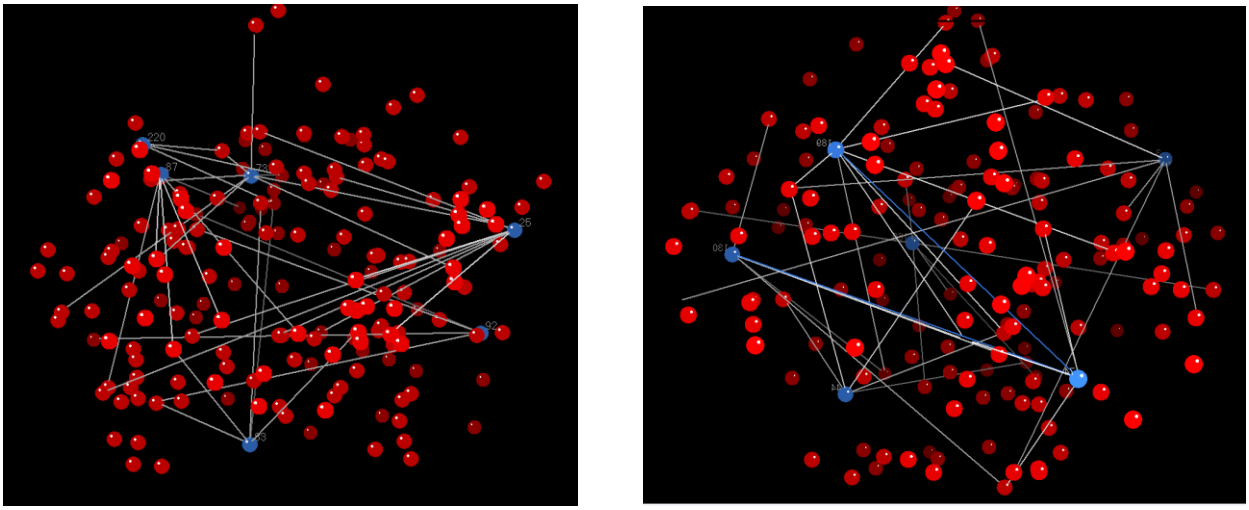

Figure 2. SNA of key players identified through contact(s) at beginning and end of semester.

Table 1

*Contact among Students per Week (*N = *245)*

	f	*M*	*SD*
*Initial (*n = *214)*			
Contact 1	114	3.59	2.22
Contact 2	72	3.22	2.18
Contact 3	48	2.92	2.14
Contact 4	37	3.54	1.92
Contact 5	25	3.20	2.56
Contact 6	16	3.69	2.27
Total	312		
*Mid-Semester (*n = *163)*			
Contact 1	127	4.11	2.11
Contact 2	93	3.25	1.82
Contact 3	65	2.75	1.54
Contact 4	47	2.77	1.62
Contact 5	34	2.32	1.22
Contact 6	26	2.38	1.33
Total	392		
*Final (*n = *177)*			
Contact 1	133	4.05	2.04
Contact 2	93	3.17	1.94
Contact 3	55	2.87	1.80
Contact 4	43	2.84	1.80
Contact 5	27	3.15	1.88
Contact 6	22	2.86	2.01
Total	373		

**Note*. Contacts per week are for only those that had contact with another participant in the course.

Research Question Two

Research question two explored how students communicate to each other about class work (Figure). Students were allowed to choose what outlet they utilized for contact with other students. Face-to-face was the most chosen way to contact others (*n* = 281) with text messaging being second (*n* = 183). Facebook was third (*n* = 174), with instant messaging being almost non-existent at 21 contacts.

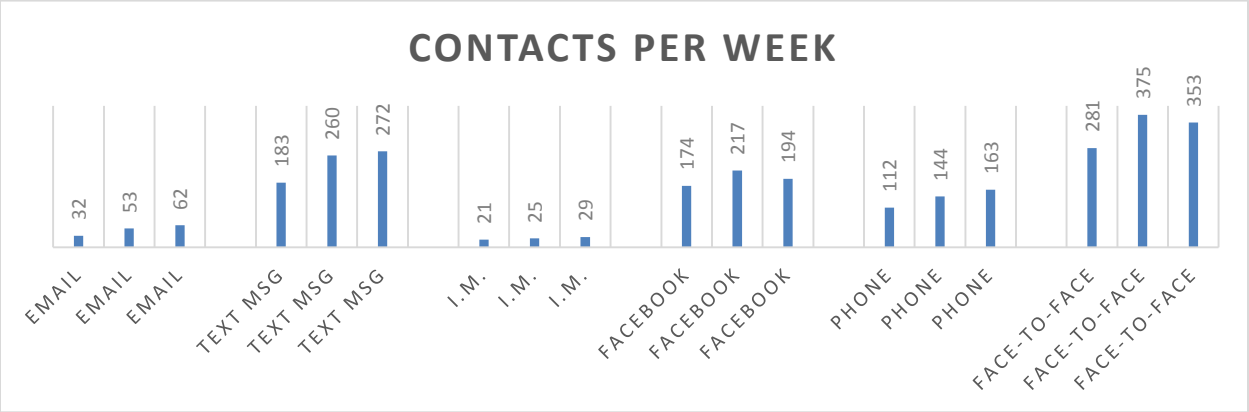

Figure 3. Frequencies of contacts weekly.

Research Question Three

Research question three was aimed to investigate the purpose of communication between students. Students were given three options for discussion choice; venting/reflecting about class, planning/information related to class, and social/personal reasons unrelated to class. Figure 4 displays that of the weekly contacts, social was the preferred reason (*n* = 261) with planning (*n* = 136) and venting (*n* = 130) closely being the means of contact after social for the reason of contact. Overall, venting increased substantially (*f* = 130 to 248) as did planning (*f* = 136 to 264). Social uses for contacts remained constant (*f* = 261 and 282).

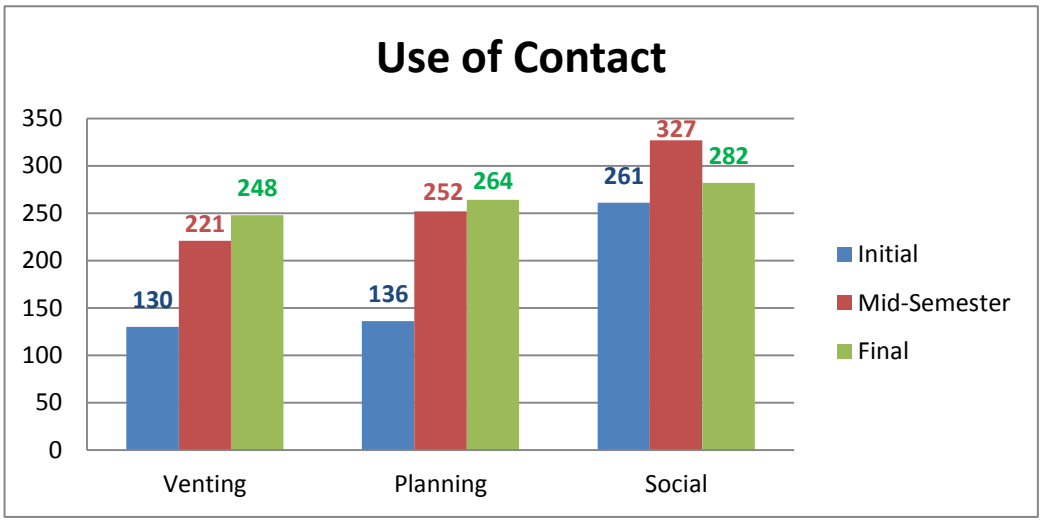

Figure 4. Frequency of participants using social networks for venting, planning, and social functions.

Research Question Four

Research question four was aimed to investigate how proficient students are at using technology. Participants extolled a technology skill level of 3.63 (Table 2). The scale used for this question on the instrument reflects that participants self-reported a technology proficiency level between average and above average skill.

Table 2

*Self-reported Proficiency Level of Technology Use (*N *= 208)*

	M	*SD*
Initial	3.63	0.84
Mid-Semester	3.57	0.82
Final	3.61	0.73

Scale = 0-No skills, 1-Little skills, 2-Below average skills, 3-Average skills, 4-Above average skills, and 5- Very skillful

Research Question Five

Research question five was geared towards investigating if students would use technology to gain access to class materials or additional class materials if it was available. Of the participants (*N* = 245), 208 answered that they would indeed use the technology access to aid in materials needed or additional materials offered for a course. During the data analysis, yes was

coded as 1 while no was coded as 2 (Table 3). The initial observation reported a mean of 1.00 (*SD* = 0.07). The mid-semester and final observations both reported a mean of 1.01 (Mid-Semester *SD* = 0.82) (Final *SD* = 0.12). Participants consistently self-reported that they would use technology access to aid in materials needed or additional materials for a course.

Table 3

Use of Technology to Gain Class Materials

	M	*SD*
Initial	1.00	0.07
Mid-Semester	1.01	0.82
Final	1.01	0.12

CHAPTER V

The purpose of this study was to explore social interaction among DBCAFLS students at the University of Arkansas. This study was guided by the following research questions:

1. How do students in classrooms communicate with each other?
2. How do students in classrooms communicate to each other about class work?
3. What are the topics discussed between students?
4. How proficient are students at using technology?
5. Will students use technology to gain class information if provided?

SUMMARY OF FINDINGS

Research Question One

Vygotsky (1978) acknowledged the importance of social interaction when he states, "every function in the child's cultural development appears twice; first, on the social level, and later on the individual level; first, between people (interpsychologial) and then inside the child (intrapsychologial)" (p.57) (As cited in Roberts, Murphy & Edgar, 2010). In order to incorporate social interaction into the learning process, the questions of how students relate in today's society were examined.

Research question one was used to examine how students communicate with each other. Data analysis revealed that of the participants (N = 245), 114 contacted another student during the initial evaluation, 127 contacted another student during the mid-semester evaluation, and 133 contacted another student during the final evaluation. The total contacts for each evaluation where 312 (initial), 392 (mid-semester), and 373 (final) which reports that more contacts were made at mid-semester then lessened towards the end of the course. Data revealed that of the participants (N = 245) 54% of students made contact with another student during the course of the semester. Overall, from beginning to end, students made more contact to other students.

According to Renninger and Shumar in *Building Virtual Communities, Learning and Change in Cyberspace* (2002), relations tie two people- two nodes- in a network. This research question defined the nodes that were already networked before the course and how the contact did changed over the semester.

Research Question Two

A social network was defined as individuals that share a connection about a common topic through some type of communication. Additionally, according to Roberts, et al (2010), "Social Network Sites (SNS) are platforms that allow users to articulate and make visible their social networks." Research question two explored how students communicate to each other about class work. Face-to-face was the most chosen way to contact others (n = 281) with text messaging being second (n = 183). Facebook was the third choice of students which agrees with the research of Roberts, et al (2010). The data suggest that though SNS are available the connections are first made with face-to-face contact and grow into a visible social network by use of SNS.

Research Question Three

Renninger & Shumar (2002) stated, "To explore communication among members of a network, we must ask questions that elicit social network data and address the overall question: 'Who talks to whom about what?'" Research question three was aimed to investigate the purpose of communication between students. Social was the preferred reason (n = 261). Social uses remained constant while there was an increase in venting (= 130-248) and planning (f = 136-264). Data suggest that though social contact remains constant throughout a given amount of time together, that those connections used socially can develop into a platform for other uses such as venting and planning.

Research Question Four

Of the seven billion people living in the world, approximately four billion use the internet ("World Internet Users Statistics Usage and World Population Stats", 2018). With the development of the internet, today's students no longer are confined to the resources only found in their classrooms or public libraries and have been given the ability to gain access to virtually unlimited quantities of information on the topics or events they are discussing in their class rooms and with their peers. ("Information Technology", 2017). Coinciding with the advances in technology, learners and how they learn is changing. To better understand if today's students are able to use the technology provided, research question four was aimed to investigate how proficient students are at using technology. Students self-reported a technology proficiency level between average and above average skill. Data suggest that even though students are living and learning in an ever advancing technological world, they report that they are skillful enough to use some of this technology but not prepared to use technology to their fullest extent.

Research Question Five

With advances in technology occurring all the time, the way people share information is changing too (Leidner & Jarvenpaa, 1995). The use of technology for communication and education is rapidly changing, but the challenges of technology-driven learning opportunities rest on questions of access and use (Collins, et al, 2018). Research question five was geared towards investigating if students would or would not use technology to gain access to class materials or additional class materials if it was available. Of the participants (N = 245), 208 answered that they would indeed use the technology access to aid in materials needed or additional materials offered for a course. Data suggest that implementing or using technology to share information about classwork or to enhance learning is what today's students would use to seek assistance for

coursework. Using technology could encourage student-faculty contact, prompt feedback, and respect diverse ways of learning (Chickering & Gamson, 1999).

Implications and Recommendations

According to Renninger & Shumar (2002), we already know that communities are not built on instrumental relations alone; therefore, to tap into both learning and community relations, it is important to ask questions that explore both task-oriented and socially oriented relations. The primary purpose of this study was to explore social interaction among DBCAFLS students at the University of Arkansas. This study revealed that of the possible participants (N = 245), 114 contacted another student during the initial evaluation. By the mid-semester evaluation 127 contacted someone and there were 122 that reciprocated contact. At the final evaluation 133 students contacted someone and 131 were contacted. The total contacts for each evaluation where 312 (initial), 392 (mid-semester), and 373 (final) which indicates that more contacts were made at mid-semester then lessened at the end of the course. Overall, from beginning to end students made more contact to other students. Out of the possible participants (N = 245), on average 50% of the students in this course shared no contact with another student. Additionally, it indicated that students prefer face-to-face contact (n = 281) over other methods such as email, text messaging, instant messaging, Facebook, and phone. Students prefer to use the above methods to communicate primarily about social/personal matters (n = 261) with planning (n = 136) and venting (n = 130) being the means of contact after social. Also, students self-reported a technology skill level of 3.63 which states that students feel that their proficiency level related to technology use is between average and above average. Of the participants (N = 245), 208 answered that they would indeed use technology access to aid in materials needed or additional materials offered for a course.

Because students do make connections by mid-semester, teachers could use this information provided to determine groups for class projects and research, presentation groups, or possibly spread information about coursework. Identifying the key players or leaders of communication could allow instructors/faculty the ability to have persons who communicate more readily guiding groups, if needed. On the other hand, the information provided could be used to indicate what students should not be grouped together because they only use communication sources to vent or talk about things other than classwork. Grouping is used primarily to increase student participation and utilize the strengths of each student. By identifying their means of communication grouping techniques could be utilized more effectively. Even with updates to technology, students still prefer face-to-face contact. With this information, instructors/faculty can realize that the addition of technology to a course can provide great supplement but that in class communication it is essential to the success of the student for face-to-face communication.

Students reported that their proficiency level of technology is between average and above average. Teachers may expect a student's level to be higher since we are living in a technology based world. With the provided data, teachers can now design their course to fit the average student. While most students agreed that they would use technology to gain resources and materials needed for a class, online learning specifically may be something to reconsider.

Based on the findings of this study and implications stated above, the following are recommendations for future research. The study should be replicated to investigate background information such as major, class status, age, etc. for each student in the course to distinguish possible networking opportunities in the class. With such a large percentage of students in the course not having contact with another student, research should be conducted to understand why

they are not communicating. The question is whether it is an issue with student personality when it comes to offering that kind of information, the make-up of background of students in the course (i.e. major, classification, etc.), or course design. Additionally, further research should be conducted to determine if the contacts made using face-to-face communication are the same or different than the students that participants are using text messaging, Facebook, or phone to communicate. Thirdly, determine if prior sub-groups (major, class status, age, etc.) can play a substantial part in social network analysis. If sub-groups can be determined and analyzed as a sub-group rather than an entire class that information could be compared to prior research in different class sizes or specific major requirements. Perhaps the class size and large differences in sub-groups disturbs the opportunity for entire network data. With students self-reporting their skill level related to proficiency in technology somewhere between average and above average, further research should be conducted to determine what types of technology students are skilled in versus which types of technology they struggle using. Data from this research would not only aid the teacher but the student. Additionally, students reported that they would indeed use technology to gain additional materials for a course and the combination of knowing this information and conducting further research on what technology is best for students, teachers could accurately provide materials to a technology source that would indeed be utilized.

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APPENDIX

Name _____ Date____/____/_____

Social Network Analysis

Directions: Please answer the following questions in the spaces provided to the right of each question. Please limit your responses to the **six** most accessed students during the present semester of this class who are enrolled in this class. Thank you for your time and participation in this study!

Please list the names of the students you interact with in this class and will use in the questions below.

Student #1 _____
Student #2 _____
Student #3 _____
Student #4 _____
Student #5 _____
Student #6 _____

	Student #1	Student #2	Student #3	Student #4	Student #5	Student #6
1. On *average*, how often did you contact this student?						
*Note - Scale for #1 & #2 (0 = Never to 7 = Several Times a Day)						
2. On *average*, how often did this student contact you?						
3. What method(s) did you use to communicate with this student? (**check all that apply**)						
– Email						
– Text messages						
– Instant Messages						
– Facebook/MySpace						
– Phone						
– Face to face						
4. For what purpose(s) did you communicate with this student? (**check all that apply**)						
– Venting/Reflecting about class						
– Planning/Information -related to class						
– Social/Personal - unrelated to class						

5. How proficient with technology are you? _____ (**Scale from 0 to 5*)
   – *SCALE (**0**-No skills, **1**-Little skills, **2**-Below average skills, **3**-Average skills, **4**-Above average skills, and **5**- Very skillful)

* *For the next question(s), please circle your choice(s).*

6. Would you use technology to gain access to class materials or additional class materials? YES ***or*** NO
   – If YES, would you help others to gain access or explain how to use technology for this reason? YES ***or*** NO

Administration #1

UNIVERSITY OF ARKANSAS

Office of Research Compliance
Institutional Review Board

December 21, 2012

MEMORANDUM

TO:	Brittany Dees Don Edgar
FROM:	Ro Windwalker IRB Coordinator
RE:	New Protocol Approval
IRB Protocol #:	12-12-346
Protocol Title:	*Evaluating the Social Networking Patterns of Students in Agricultural Classrooms*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 12/21/2012 Expiration Date: 12/20/2013

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (http://vpred.uark.edu/210.php). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 250 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

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