Exploring Interaction between Student Teachers During the Student Teaching Experience

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The purpose of this study was to explore social interaction between student teachers during the student teaching experience. This descriptive study consisted of 22 student teachers from the spring 2007 semester at Texas A&M University. Data were collected immediately following conclusion of the 12–week internship at a regularly scheduled face–to–face meeting. It was concluded that every student teacher interacted with a peer during the experience. However, they interacted with only a small percentage of their peers on a weekly basis and they did not interact at all with a large portion of their peers. Student teachers most frequently used either the telephone or face–to–face opportunities to interact. The majority also frequently used email and text messages to interact. Facebook, MySpace, and instant messaging were used very little. Depending on the purpose, student teachers interacted with different small networks of three to five peers. Different student teachers emerged as key players or opinion leaders, depending on the reason for interaction. This exploratory study yielded a considerable number of questions for further inquiry.

Introduction/Theoretical Framework

Today's student teachers have a plethora of resources at their disposal for the acquisition of knowledge. As our society continues to press onward into the digital age, students can readily access information and communicate with other students with relative ease and ubiquity. Today's students are involved in a society where social barriers are transparent and knowledge is readily available. Students are able to interact with others and knowledge can be gained through those interactions anywhere and at times of their choosing whereby proximity being non–essential (Foster & Wolf, 2007). The extent that student teachers interact is not fully understood and should be investigated. Of particular relevance to this study is how communication technologies are used to facilitate learner–learner interaction.

The theoretical foundation of this study is rooted in the grand theory of constructivism which asserts that learners create understanding through experience (Fosnot, 1996) and that students constantly create knowledge through personal experiences (Doolittle & Camp, 1999). Doolittle and Camp further stated that constructivism identifies the student's continuous position in "the personal creation of knowledge, the importance of experience (both individual and social) in this knowledge creation process, and the realization that the knowledge created will vary in its degree of validity as an accurate representation of reality" (p. 7).

Not a unified, single theory, constructivism has several flavors. Social constructivism postulates that knowledge is social in nature and results from social interaction rather than individual experiences (Doolittle & Camp, 1999). The dynamic process of knowledge acquisition relies on social interactions to clarify

knowledge and process experiences. Understanding this social interplay could provide insight in to developing more impactful field experiences for preservice teachers. Thus, social constructivism was chosen as the overarching theory to examine interactions as they relate to learning experiences during student teaching.

Student teaching is a social experience. Student teachers interact with high school students, teachers, university faculty, and fellow student teachers. According to Bandura (1977), these 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). Additionally, he proposed that all higher tasks begin in relationships involving individuals. Vygotsky's social development theory spurred the concept of situated learning by Lave and Wenger (1991), who purported that learning generally takes place as a function of activity, context, and the culture in which learning occurs. They further described situated learning as to place thought and action in a specific place and time, which involves other learners, the environment, and the activities to create meaning. They further postulated that to situate learning is explained by defining a particular setting in which the thought and action processes are incorporated by experts in order to achieve skill. Thus, the learner will undertake knowledge tasks. Lave and Wenger stated that the premise of situated learning is that learning occurs at all times and in all activities of the individual. Because of the social nature of situated learning, learning and beliefs are influenced greatly through activities and outcomes associated with activities. Further understanding of individuals has been explained with Bandura's (1986) social cognitive theory which postulated that individuals develop and function within many social influences, not an isolated environment.

The importance of social interaction to learning is further supported in the seven principles of good practice in education (Chickering & Gamson, 1987). Thurmond (2003) defined interaction as "the learner's engagement with the course content, other learners, the instructor, and the technological medium used in the course. True interactions with other learners, the instructor, and technology result in a reciprocal exchange of information" (Thurmond, p. 4). Learner–learner interaction can assume the role of one student to another or between multiple students engaged in group settings or alone (Moore, 1989). Moore further stated that learner–learner interaction is an extremely valuable and even essential.

An understanding of how student teachers learn during the complex nature of field experiences should examine the many dimensions of the environments in which these experiences occur. Through the social theory of learning, Wenger (1998) outlined four components inherent in a social environment: meaning, practice, community, and identity. Meaning refers to an associative perception of an experience to understand learning. Practice denotes the experience of learning as doing which brings a collective understanding of resources, frameworks, and perspectives. Learning as belonging is identified as community which signifies that participation is essential. Lastly, identity involves the process of how learning changes individuals and creates meaning through the experience. Communities of practice are a direct product of these components and are described as being everywhere and changing through the course of our lives.

Social Network Analysis (SNA), which focuses on understanding the nature and consequences of ties between individuals or groups (Scott, 2000; Wasserman & Faust, 1994), has become an increasingly popular method within the social sciences for exploring human and social dynamics. Therefore, exploring early conceptions and use of new media can shed light on the social environments that produce and consume such technology.

Social Network Sites (SNS) are platforms that allow users to articulate and make visible their social networks. This can result in connections between individuals that would not otherwise be made, but that is often not the goal.

These meetings are frequently between "latent ties" (Haythornthwaite, 2005) who share some offline connection. On many of the large SNSs, participants are not necessarily "networking" or looking to meet new people; instead, they are primarily communicating with people who are already a part of their extended social network. Although SNSs were not around in his time, Dewey (1916) recognized the importance of communication to learning when he stated:

> Not only is social life identical with communication, but all communication … 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 … has his own attitude modified. Nor is the one who communicates left unaffected. (p. 5)

Although not specifically a learning theory, Rogers' (2003) diffusion theory was also used to strengthen the framework for this study. 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 applied in the current study, the social system was the network of 22 student teachers, and opinion leaders were students that were sought out by their peers for guidance and information about the student teaching experience.

The networks in which student teachers are involved facilitate learner–learner interaction and have great potential to influence their knowledge and experience (Bandura, 1977; 1986). Furthermore, technology affects these networks (Thurmond, 2003). Learner–learner interaction between student teachers does not have to occur face–to–face; it can be mediated through technologies. Additional understanding of social networks will assist in designing and implementing educational activities during the experience.

The use of networks via technology in teacher education programs has had limited attention. Allan (2007) concluded teacher education programs should focus on technology

rich experiences and communication with the surrounding community. Bodzin (2000) concluded that preservice teachers using an asynchronous Web–based forum in a reflective online community of practice found it offered new opportunities for participants to converse and reflect on classroom issues during field experiences. Investigating the use of technology by preservice teachers, Barnett (2006) found "teachers can study real–life teaching situations, evaluate their ideas of effective teaching, reflect on their conceptions of teaching, and develop their notions of good teaching through collaborative discourse with their peers" (p. 16). FitzGibbon, Oldham, and Johnston (2007) found that for preservice teachers, social networks afforded new types communication and interaction although the findings further suggest these to be limited to students' social sphere and not professional technology skills. Liberman (2000) stated:

> It should be further noted that "enabling members to participate in creating and sustaining a group that advanced their professional identity, interests, and learning released great power and energy. These collaborative relationships helped to build trust within the group, essential to the development of new ideas." (p. 223)

Synthesizing the above–mentioned theories, this study examined social interactions in a community of practice that could potentially influence learning as students construct meaning from the student teaching experience. Face–to–face and technology–mediated interactions between learners result in networks with specific learners emerging as opinion leaders. Other research examining the frequency in which interaction occurred, the technologies used to interact, the purposes of the interaction, or the social networks that exist among student teachers could not be found. This study sought to examine this phenomenon.

Purpose

The purpose of this study was to explore the social interactions between student teachers

during the student teaching experience. The following research questions guided the inquiry:

1. How frequently do student teachers interact with their peers?
2. What methods do student teachers use to interact with each other?
3. For what reasons do student teachers interact with their peers?
4. What are the social networking patterns of interaction between student teachers?

Methodology

This exploratory descriptive study consisted of a convenient sample that included all student–teachers from the Spring 2007 semester at Texas A&M University ($N = 22$). Data were collected immediately following conclusion of the 12–week internship at a regularly scheduled face–to–face meeting from all student teachers (100%).

A researcher–developed instrument was used to assess interaction between student teachers. The instrument was developed through a review of the literature and personal experience of the researchers. Face and content validity of the instrument were determined through a review by an expert panel of teacher educators not involved in the project. Because the instrument asked for recall of past behaviors, it was believed that participants could accurately and reliably provide the requested data (Dillman, 2000). Questions were written to keep "recall simple and related to recent events" (p. 37).

The four–question instrument was constructed as a matrix with all student–teacher's names as column headers and the questions (with response options) as row headers. The first two questions were designed to solicit the frequency in which each student–teacher interacted with each of their peers: (a) On average, how often did <u>you contact</u> this student teacher? and (b) On average, how often did this student teacher <u>contact you</u>? Participants were instructed to respond using an eight–point rating scale that ranged from 0 = "never" to 7 = "several times a day." The third question instructed participants to indicate all the technologies in which they communicated with

each peer. Options included: email, text messages, instant messaging, Facebook or MySpace, telephone, and face–to–face. The fourth question sought to determine reasons for which each participant communicated with each of their peers. Participants could select venting/reflecting about student teaching, planning/information – related to student teaching, and/or social/personal – unrelated to student teaching. These three options were deemed sufficient to cover the breadth of potential interactions and supported by the panel review of the instrument.

Social networks were examined through network analysis. In network analysis, *nodes* are points on a network and *edges* are connections. In social network analysis, nodes are normally people, and edges are interactions between them. *KeyPlayer* is a software program that identifies optimal sets of nodes in a network for either of two purposes. The program can be used to find the set of key nodes that, if removed, would most cripple the network—would in effect disconnect the greatest number of other nodes. In KeyPlayer this is called *Remove*. The other purpose coded into the program, called *Observe*, is to identify nodes that are well–connected, or likely to possess a great deal of opinion leadership. Rogers (2003) would call these people opinion leaders. These two different purposes are accomplished using two different algorithms. They do not yield the same set of nodes. For this study, KeyPlayer's Observe function was employed. The goal of Observe is to find the fewest number of nodes that reach the greatest number of others. Fewer key players are good, but it is balanced against increasing the percentage of network nodes reached. Simply choosing the nodes with the greatest total number of connections is not sufficient. Some people may have a great number of connections, and yet reach very few other people because they all share the same, redundant, connections. So, one important point in understanding the KeyPlayer score is that it represents the number of distinct, or non–redundant, connections to others.

Within the Observe function, the researchers established some limits for this analysis. Each analysis was started by setting the number of

steps, called *reach* in network analysis, to 1. A reach of 1 requires a direct link (interaction) between a key player and any other member. If the number of steps is set to 2, the measure of reach becomes the number of distinct persons who are within two links (e.g. a friend of a friend) of any member of the set of key players. This worked well for all three of the networks for which there was a purpose. For the overall network, the reach was increased to 2 to allow for the interactions, to find the key players that might exist between what were essentially three networks with different purposes.

For the KeyPlayer Observe analysis portion of this study, four sets of network data were created. The researchers hypothesized that there may be distinct networks, based on the purpose of the interaction. This is also consistent with Rogers' (2003) concept of monomorphic opinion leadership, in that individuals possess opinion leadership among their peers on a single topics. In contrast, polymorphic opinion leaders would possess opinion leadership on multiple topics. One overall set of network data included all communications between student teachers for any purpose. A second set was created that included only those communications for reflecting or venting purposes. A third set was created that included communications only for planning of information purposes, and a fourth set included only communications the student teachers characterized as purely social or personal in nature. These networks were analyzed using 1 as the number of steps and group size, the number of key players, was increased until 100% of the network was reached, or no increase in the percentage reached was realized from adding additional key players. These data are best viewed as three–dimensional Kinemages; however, they have been rendered into two–dimensional images for presentation in this article.

Findings

As reflected in Table 1, student teachers who interacted frequently, interacted with one peer several times a day ($n = 12$). This was likely due to the 12 student teachers placed in pairs at six schools. Student teachers did not interact with any of their peers exactly once a day. Most student teachers ($n = 17$) did not interact with any of their peers a few times a week, although five student teachers did interact with up to four peers a few times a week.

Table 1
Frequency of Interaction between Student Teachers

Interacted with a Peer:	Number of Peers Interacted With			
	Min	Max	Mode	Median
Several Times a Day[a] ($n = 12$)	0	2	1	1
Once a Day ($n = 0$)	0	0	0	0
A Few Times a Week ($n = 5$)	0	4	0	0
Once a Week ($n = 4$)	0	1	0	0
Every Few Weeks ($n = 13$)	0	5	0	1
Once a Month ($n = 14$)	0	6	0	1
Less Than Once a Month ($n = 21$)	0	9	3	2.5
Never ($n = 22$)	10	19	11	14.5

[a]12 student teachers were placed at schools in pairs.

Most student teachers ($n = 18$) did not interact with a peer once a week, but four student teachers did interact with a single peer once a week. The majority of student teachers ($n = 13$) interacted with one to five peers every few weeks. The majority of student teachers ($n = 14$) also interacted with one to six peers once a month. Nearly every student teacher ($n = 21$) interacted with one to nine peers less than once a month. These 22 student teachers never interacted with between ten and 19 of their peers.

An interaction score was calculated for each student teacher by assigning a value to the frequency of interaction with another student teacher (never = 0, to several times a day = 7). The scores were summed for a maximum possible score (interacting with 21 student teachers several times a day; 21 x 7) of 147. Conversely, the minimum possible score (never interacting with another student teacher; 21 x 0) was 0. For this group, the maximum score observed was 34, while the minimum score was 3. The mean score was 15.8 (*SD* = 7.8) and the mode was 10.

Student teachers interacted in a variety of ways, with many mediated through some sort of technology. Telephone and face–to–face were the most common methods, each used by nearly 91% of the student teachers (see Table 2).

Table 2
Methods to Interaction Between Student Teachers

Method	Number of Student Teachers that Used Method		Number of Peers Interacted With				
	f	Percent	Min	Max	*μ*	Std. Dev.	Percent
Face–to–face	20	90.9	0	11	5.05	3.12	22.9
Telephone	20	90.9	0	7	3.59	2.44	16.3
Email	17	77.3	0	8	1.95	1.99	8.9
Text Messages	13	59.1	0	7	1.55	2.02	7.0
Facebook/MySpace	5	22.7	0	4	.46	1.06	2.0
Instant Messaging	3	13.6	0	3	.23	.69	1.0

Email was the next most common method, used by 77.3% of the student teachers. Text messages were used by 59.1% of the student teachers. Interacting through Facebook or MySpace was used by only 22.7% of the student teachers. Instant messaging was the least used method, used by only 13.6% of the student teachers.

Student teachers interacted with their peers for a variety of purposes (see Table 3). On average, student teachers interacted with 20.5% of their peers to discuss planning and other information related to the student teaching (i.e. logistical information). Every student teacher interacted with at least one peer for this purpose and some student teachers interacted with as many as 11 peers for this purpose. On average, student teachers interacted with 18.6% of their peers about social or personal issues unrelated to student teaching. Interestingly, two student teachers did not interact with anyone while one student teacher interacted with nine peers for this purpose. On average, student teachers interacted with 16.3% of their peers to vent or reflect about the student teaching experience. One student teacher did not interact for this purpose, while another interacted with nine peers.

Table 3
Number of Peers Interacted With for Specific Purposes

Purpose for Interaction	Min	Max	*μ*	Std. Dev.	Percent
Planning/Information – Related to Student Teaching	1	11	4.50	2.91	20.5
Social/Personal – Unrelated to Student Teaching	0	9	4.09	2.52	18.6
Venting/Reflecting about Student Teaching	0	9	3.59	2.46	16.3

Based on data collected, graphical interaction models were developed to explain the interconnectedness of student teachers. Models are presented below to illustrate interaction for planning and information related to student teaching (Figure 1); interaction for social and personal reasons (Figures 2 and 3); interaction for venting or reflecting about the student teaching experience (Figure 4); and an overall model of interaction for any reason (Figure 5).

When examining the model of interaction for planning and information related to student teaching (Figure 1), student teacher 5 and student teacher 15 emerged as key players; connecting many of their peers. These two key players reached 81.8% of the student teachers with one step. Interestingly, these two student teachers had no interaction with each other; however, student teachers 4, 7, 13, 14, and 17 interacted with both of these two key players. Student teachers 9, 11, 18, and 21 did not connect with either key player in one step.
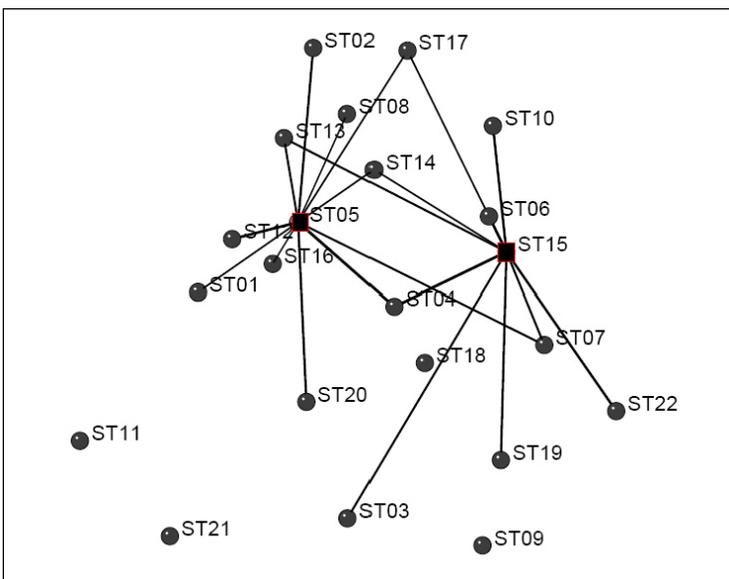

Figure 1. Interaction for planning and information related to student teaching.

The complete model of interaction for social and personal reasons (Figure 2) revealed an interesting observation. Student teacher 21 was completely separated from her peers. Anecdotal evidence may shed light on this situation and is presented as discussion later. To better examine interactions between the remainder of the student teachers, student teacher 21 was removed and a new model created (Figure 3). In this model, student teachers 16 and 19 emerged

as key players. These two key players were connected to 85.7% of the group in one step. Interestingly, these two student teachers had very limited interaction with each other, but extensive interaction with their peers. Only two student teachers (8 and 18) were connected to both. While student teachers 3, 6, and 7 did not connect to neither in one step.
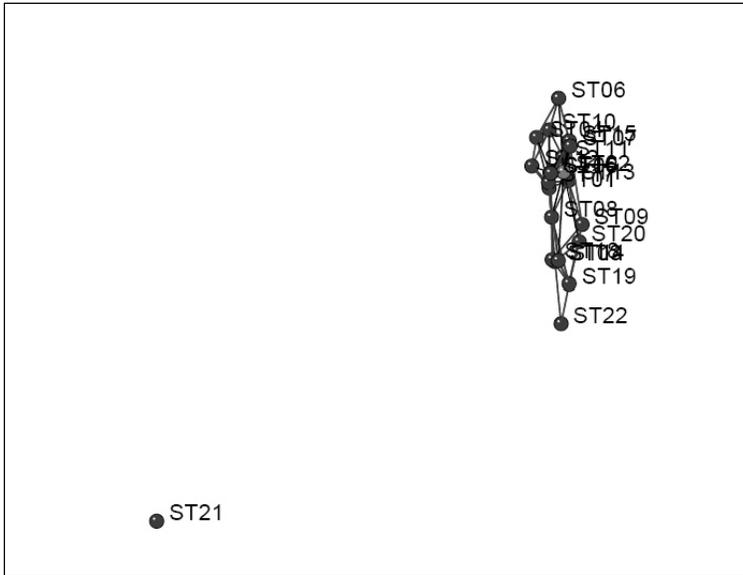
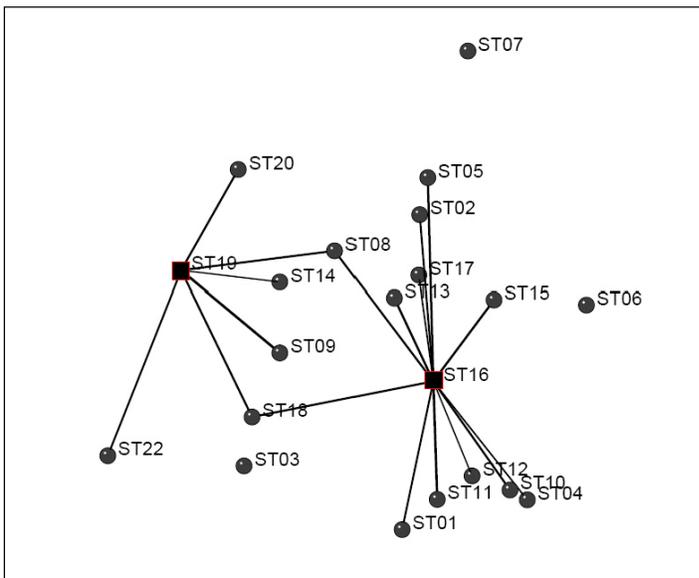*Figure 2*. Interaction for social and personal reasons.

Figure 3. Interaction for social and personal reasons with student teacher 21 omitted.

The model of interaction for venting and reflecting about the student teaching experience revealed yet another pattern (Figure 4). Student teachers 4 and 18 emerged as key players, reaching 77.3% of the group in one step. Only student teacher 16 was connected to both. Student teachers 3, 7, 17, and 22 failed to connect to either of the key players in one step.
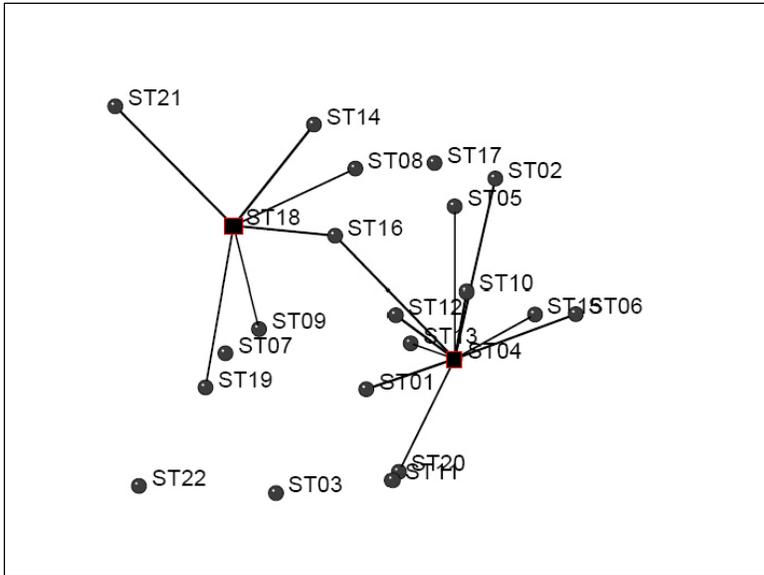
Figure 4. Interaction for venting and reflecting about the student teaching experience.

Combining the previous models allowed for an examination of all interaction between student teachers (Figure 5). In this model, student teachers 2, 15, and 19 emerge as key players.
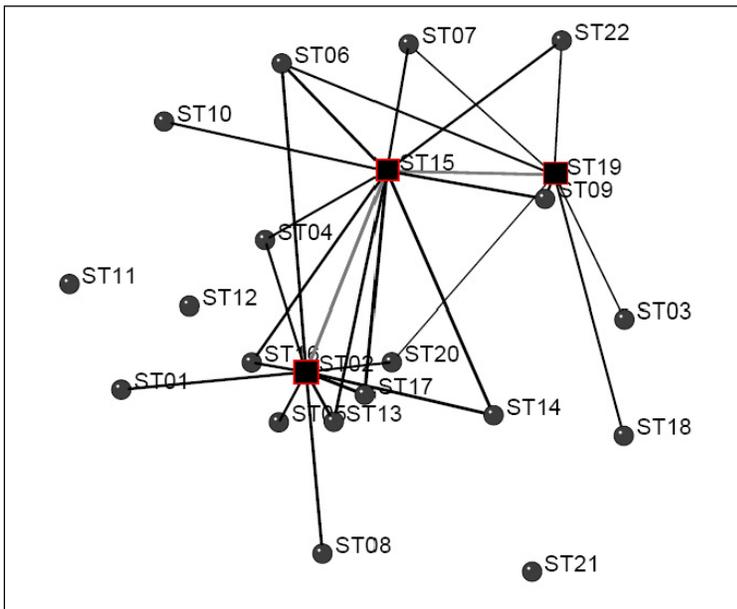

Figure 5. Interaction between student teachers for any reason.

Only student teachers 11, 12, and 21 remained unconnected to one of these three key players in one step. However, with two steps, 100% of the student teachers were connected to one or more of the three key players. Student teacher 15 was the most connected as she also connected with the other two key players (2 and 19), which were not connected to each other.

Conclusions, Recommendations, and Implications

Based on the findings of this study, several conclusions can be drawn about this particular group of student teachers. First, every student teacher interacted with a peer during the experience; however, student teachers interacted with only a small percentage of their peers on a weekly basis and they did not interact with a large portion of their peers at all. Aside from the student teachers placed together at the same school, there were few student teachers who interacted daily. Taken as a whole, this group of student teachers would not be described as close-knit; interacting with fewer than half of their peers. With 22 student teachers in this group, the observations seem reasonable. Perhaps if the number of student teachers were fewer or greater, these figures would be different. Regardless, data showed that student teachers in this group participated in a learning experience with learner–learner interaction, although the level of interaction varied. The existence of these interactions would support that student teaching is a social learning experience and is consistent with the work of Bandura (1977, 1986), Lave and Wenger (1991), Moore (1989), and Vygotsky (1978.

Student teachers most frequently used either the telephone or face–to–face opportunities to interact with their peers. The majority also frequently used email and text messages to interact. Facebook, MySpace, and instant messaging were used very little. A contributing factor could have been limited access to these technologies during the school day due to Internet filters at the school sites. Interestingly, with the explosion of technologies, the two most commonly used methods of interaction, face–to–face and telephone, have been available to student teachers for decades, although the predominant type of phone used by today's student teachers was likely a mobile phone. Interestingly, these were both synchronous communication methods. Two newer asynchronous technologies, email and text messages, were also used by the majority of student teachers. Instant messaging, Facebook, and MySpace were used very little. Perhaps instant messaging was used very little because it requires synchronous interaction, which was likely difficult during the school day.

Student teachers interacted with small networks of three to five peers, depending on the purpose of the interaction. In this group of student teachers, no one emerged as a polymorphic opinion leader (Rogers, 2003). Thus, for each type of interaction (planning/information, social/personal, and venting/reflecting), a distinct social network emerged. Different student teachers emerged as key players or opinion leaders for each network. It would appear that student teachers identified groups of peers that offered the pertinent or relevant information to a particular issue and that a few key players emerged for each type of interaction. This phenomenon seems congruent with Rogers' notion of monomorphic opinion leadership and consistent with Bandura's (1986) concept of peer modeling.

Several student teachers were largely disconnected from their peers. For example, student teacher 21 had very few interactions with her peers. The researchers surmise that several factors may have contributed to her disconnectedness. First, she was the only African–American in this group. Perhaps cultural differences contributed, particularly for social and personal purposes. Even prior to student teaching, this individual did not seem to connect with her peers during other preservice coursework. A second contributing factor could have been geographic in nature in that her school was far from most of the other student teachers and located in a different FFA district. This distance likely contributed very little "accidental" interaction that occurred as student teachers attended various events. Interestingly, student teacher 11 was similarly disconnected, with one exception. He and student teacher 1 were placed at the same school. Student teacher 11 had extensive interaction with student teacher 1, who in turn, was very connected with many other student teachers. If supplemental research were to verify the importance of this interaction, then it would be wise to identify potentially disconnected student teachers prior to student teaching and place them at a school with another student teacher.

Although exploratory, the results of this study may give teacher educators some insight in to enhancing the student teaching experience. Teacher educators are encouraged to examine their student teachers to identify social networks and the natural opinion leaders. This knowledge could be used to better facilitate learner–learner interaction and ultimately increase the amount of learning that occurs during the student teaching experience.

The design of this study produced some limitations. First, there are numerous variables that could have contributed to the amount of interaction that could not be controlled for, such as the time of year, the number of student teachers, gender, ethnicity, personality type, and others. Replication of this study should include steps to account for these variables. Another contributing variable could have been the amount and quality of interaction with the cooperating teacher. Subsequent research should also assess this interaction. Finally, venting and reflecting were grouped in to the same category. Perhaps those are in fact two different purposes. Further research should seek to determine if they should be grouped or separated.

The exploratory nature of this research provides limited implications for practice, but considerable questions for further inquiry. The following questions are offered for further research:

1. Would similar conclusions be drawn from other groups of student teachers? Does time of year (fall versus spring) make a difference? Does size of a student teaching group make a difference? What about gender, ethnic composition, or age?
2. Does interaction affect the quality of the learning experience? Do disconnected student teachers have a lower quality experience? Are they less likely to enter teaching? Do they learn as much as their connected peers? Are there demographic, personality, or cognitive differences between connected and disconnected student teachers?
3. Are there demographic, personality, or cognitive variables that influence the amount of interaction? Do these variables influence the technology(ies) chosen to facilitate interaction?
4. How early in a preservice program do these networks form? Are there interventions that can help disconnected student teachers connect with their peers? If these networks form early in a program, are the key players consistent or do they change over time?
5. Do student teachers identified as key players have a different student teaching experience than their peers? Do these key players make a difference in the quality of experiences for their peers? If so, what skills would help these key players effectively fulfill this role?

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