Cultivating Change Through Peer Teaching

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The purpose of this qualitative research study was to describe the impact of peer teaching on both the students and the classroom environment. Students, enrolled in two Introduction to Teaching courses in agricultural and extension education, were asked to engage in peer teaching activities. The researchers utilized discourse analysis, textual analysis, individual interviews, and focus group interviews to gather data addressing the research objectives. Overall, participants enjoyed both peer teaching and being taught by peers. The peer teaching environment facilitated student interaction which allowed students to assume the role of active participants. Students laughed, talked, and interacted throughout the lessons, creating a warm and inclusive atmosphere. Specifically, students that engaged in peer teaching displayed elements of metacognition, self-reflection, and career formation, coupled with a classroom environment free from the typical instructional and relational constraints associated with instructor/learner interaction.

Keywords: peer teaching, instructional techniques, learner centered instruction, active learning

Introduction

The engagement of students in the learning process is an important component in successful university classrooms. All too often, students enter a classroom, take a seat, listen to a lecture and leave without engaging in higher order thinking skills (Bloom, 1984). Students usually remain unmotivated, disconnected, and cognitively disengaged during the lecture (Brophy, 2004). The 1998 Boyer Commission highlighted the engagement difficulties in college classrooms and stated that:

> Some of their instructors are likely to be badly trained or even untrained teaching assistants who are groping their way toward a teaching technique; some others may be tenured drones who deliver set lectures from yellowed notes, making no effort to engage the bored minds of the students in front of them. (p. 6)

One opportunity to increase student engagement is through peer teaching. Peer teaching encourages students to assume a more active role in knowledge acquisition (De Lisi, 2002; Topping, 2005; Wadoodi & Crosby, 2002). De Lisi believed that educational practices, including peer learning and peer interaction, "…should be systematically examined and evaluated" (p. 5). Therefore, the purpose of this research was to examine student perceptions of peer teaching and peer-to-peer interaction.

Theoretical Foundation

Vygotsky and Piaget developed two widely accepted theories of learning (Piaget, 1985; Vygotsky, 1978) that have made lasting contributions to our societal understanding of learning, and in the process, developed a foundation for peer teaching. Vygotsky developed the Sociocultural Theory of Learning based on the active involvement of peers, adults, and teachers in the learning process. Specifically, Vygotsky believed advanced or more knowledgeable peers, teachers, or other

adults greatly aided the learner in the construction of knowledge. Adults or peers, with a greater degree of knowledge, are capable of assisting and directing the learner in such a way as to promote a learning dialogue (O'Donnell & O'Kelly, 1994; Palincsar, 1998). As the learner engages with more knowledgeable individuals, the learner is able to begin the process of co-construction of knowledge. Co-construction was defined by Woolfolk (2001, p. 44) as, "A social process in which people interact and negotiate (usually verbally) to create an understanding or to solve a problem." During the co-construction of knowledge, the learner is able to acquire the skills and confidence necessary to begin the process of concept mastery (Woolfolk, 2001).

Furthermore, Vygotsky believed learning could occur at a greater rate when individuals were challenged by a more knowledgeable or capable individual (Hogan & Tudge, 1999). Most often, this more knowledgeable individual is embodied in the role of adults or teachers; however, peers, if they hold a higher degree of subject knowledge, are able to assume the role of the more capable individual. Vygotsky's theory emphasized the role of peers as knowledge providers, yet held at its foundation the sociocultural view that learning could not be removed from the social context (De Lisi & Golbeck, 1999; Vygotsky, 1978). Hogan and Tudge (1999) stated that while Vygotsky's theory emphasized more child-parent/teacher interaction, Vygotsky's theory also, ". . . has tremendous implications for our understanding of peer collaboration" (p. 40).

Piaget's Theory of Cognitive Development (1985) was largely based on the active involvement of peers. As peers interact with each other, they challenge the established norms, effectively creating a state of learner disequilibrium (Palincsar, 1998). The state of disequilibrium ". . . forces the subject to go beyond his current state and strike out in new directions" (Piaget, 1985, p. 10). Thus, learners are challenged to work with others, discuss ideas, and eventually reach a cognitive equilibrium (De Lisi & Golbeck, 1999; Palincsar, 1998).

Piaget believed that interaction between individuals occurred on a continuum from constraint to cooperation (Piaget, 1965). When learners engage in an activity with a person in whom they were obligated to obey, the learner

feels a sense of constraint which can alter or discourage the learning process (Burk, 1996). On the other hand, when learners communicate with a truly equal peer, a feeling of cooperation emerges, forming a foundation for significant, retained learning (De Lisi, 2002).

Therefore, the theoretical base for peer teaching encourages the synthesis of both Piagetian and Vygotskian theories. Peer teachers serve the role of the more knowledgeable peer, while engaging in peer-to-peer instruction. While the theories of Piaget and Vygotsky are often viewed as antagonistic, in the case of peer teaching, they appear in concert, each lending valuable insight on the social and cognitive foundations for peer teaching.

Conceptual Framework

Despite the theoretical basis supporting the utilization of peer instruction, the concept of peer teaching did not significantly appear in educational research until the early 1960s (Goldschmid & Goldschmid, 1976). The resurgence of interest in peer teaching can likely be ascribed to two documents: the American Psychological Association 1993 document, *The Learner-Centered Psychological Principles: A Framework for School Reform and Redesign* (APA, 1993), and the Boyer Commission's *Reinventing Undergraduate Education: A Blueprint for American Research Universities* (The Boyer Commission, 1998). Both documents delivered powerful arguments for the use of active, *peer-involved approaches* in education. Peer-involved approaches included the synonymous terms of peer teaching and peer instruction.

Peer instruction, as defined by Boud, Cohen, and Sampson (1999), "refers to the use of teaching and learning strategies in which students learn with and from each other without the immediate intervention of a teacher" (pp. 413 - 414). When delivered via a tutoring method, peer instruction has been shown to have positive impacts on both the peer teacher and the student (De Lisi, 2002; Topping, 2005). Pascarella and Terenzini (2005) stated that:

> There is both experimental evidence (Semb et al., 1993) and correlational evidence with appropriate controls for ability (Astin, 1993c) to suggest that tutoring itself can have an important, positive impact on

knowledge retention. Thus, learning the material to teach another student may be a particularly effective way to increase content mastery. (p. 111)

In a further acknowledgement of the positive effects of peer interaction, Pascarella and Terenzini (2005) stated that, "Peer interactions, particularly those that extend and reinforce what happens in the academic program, appear to influence positively knowledge acquisition and academic skill development during college" (p. 121).

Purpose and Research Objectives

The purpose of this qualitative study was to explore student perceptions of peer teaching. The research objectives were written to examine qualitatively three distinct aspects of peer teaching.

RO 1: Describe the psychological aspects of peer teaching.

RO 2: Describe the power relationships and classroom roles of students engaged in a peer   teaching course.

RO 3: Describe changes to the students' sense of belonging or engagement as a result of peer teaching.

Research Methods

Researcher Epistemology, Theoretical Perspective, and Methodology

It is imperative in qualitative research for researchers to expose personal biases that have the potential to shape data collection and analysis. The researchers acknowledge a social constructivist epistemology, nestled in the belief that ". . . the mind is active in the construction of knowledge" (Schwandt, 2001, p. 31). Furthermore, social constructivism provides a framework utilized by the researchers to "…understand how social actors recognize, produce, and reproduce social actions and how they come to share an intersubjective understanding of specific life circumstances" (Schwandt, 2001, p. 31-32).

The theoretical perspective of the researchers was grounded in hermeneutical inquiry and discourse analysis. According to Crotty (2004), hermeneutics is characterized by

researcher focus whereby, "determination of meaning is a matter of practical judgment and common sense, not just abstract theorizing" (p. 91). Mertens (2005) described hermeneutics as a process where efforts are made to obtain multiple perspectives that yield better interpretations of meanings.

The researchers also employed a theoretical perspective grounded in discourse analysis. Gee (1991) describes discourse analysis as examining the written text of the story for its component parts or assessing the spoken words by looking at intonation, pitch, and pauses as a lens to the meaning of the text. The researchers utilized discourse analysis to explore the written and oral thoughts as well as the opinions and perceptions of the participants.

The researchers utilized discourse analysis, textual analysis, individual interviews, and focus group interviews. Research methods were congruent with the constructivist epistemological and theoretical stance of the researchers and subscribed to the work of Eichelberger (1989) to, "do a great deal of observation, read documents produced by members of the groups being studied, do extensive formal and informal interviewing, and develop classifications and descriptions that represent the beliefs of the various groups" (p. 9).

According to Guba and Lincoln (1989), no form of research is value free. Therefore, while detached observation and whole-hearted objectivity are goals, in reality, research is viewed through the lens of the researcher. Guba and Lincoln stated:

> Values enter an inquiry through such channels as the nature of the problem selected for study ...the choice of paradigm for carrying out the inquiry, …the choice of instruments and analysis modes, the choice of interpretations to be made and conclusions to be drawn. (p. 65)

Participants

The population for this research consisted of participants enrolled in a single course offered on two different college campuses (main and branch). While the course content, materials, and planning were the same, each course had a

different instructor. The participants consisted of 23 students from the main campus and 16 students from the branch campus. Prior to collecting data, the researchers submitted and obtained Institutional Review Board approval for conducting research on human subjects.

Three weeks into a ten week quarter, the participants were paired in groups of two or three students and asked to assume the leadership in preparing and conducting one 50-minute class session. The total allotted class time of 78 minutes was split between the peer teachers (50 minutes), instructor wrap-up (20 minutes), and any additional student feedback. The peer teachers were assigned one chapter of the course text, and then encouraged to exercise critical thinking and creative thought in the teaching of one class session. In addition, the peer teachers were offered a $25 budget for the purchase of supplies or materials necessary for presenting course content. During week five of the quarter, the peer teachers began teaching course content. Peer teachers were asked to teach the class and provide a list of possible test questions over the material they taught. At the conclusion of the peer teaching lesson, the course instructor asked questions, probed for clarity, and provided additional content as needed. After the class concluded, the peer teachers remained with the course instructor for a 15-minute reflection on the effectiveness of their lesson.

Credibility and Dependability

Patton (1990) believed the internal validity or credibility of research was enhanced through the triangulation of data. In an effort to provide the highest level of research credibility, and to meet rigorous validity standards, the researchers utilized two of Patton's (1990) four types of triangulation: data triangulation and triangulation through multiple analysts. All interview, focus group, observation, and textual analysis data were collected and analyzed individually, and then combined through the efforts of both a male and a female researcher. Furthermore, member checks were utilized to seek participant feedback on whether or not the recorded data were reflective of their actual perceptions (Lincoln & Guba, 1985).

Dependability (Hoepfl, 1997) was gained through diversified methods of measurement and the researchers' use of an inquiry audit (Lincoln & Guba, 1985). The researchers continually examined the process and product of the research, looking for and establishing a consistency of data necessary to provide dependability (Hoepfl, 1997). The participants themselves established a measure of dependability through the consistent themes that emerged from their peer teaching reflections.

Data Collection and Analysis
   Discourse Analysis

Discourse analysis was used to analyze the participant observations. The researchers conducted four observations and developed copious notes detailing emergent areas specific to the research objectives. One of the researchers was the instructor of the section, and therefore engaged in participant observation; while another researcher was unknown to the students, and engaged in non-participant observation. The use of multiple researchers allowed for further triangulation of the data. The researchers observed interactions between peer teachers, peer participants and the course instructor. The notes documenting the discourse were analyzed and coded to determine elements reflective of the research objectives.
   Textual Analysis

Students were asked to reflect on their personal perceptions of peer teaching. The written student reflections were collected, analyzed, and coded to elucidate student perceptions of the peer teaching experience. The peer teaching reflections were non-graded assignments designed to foster a non-threatening, open forum for the collection of student thoughts and opinions. Data were collected from these personal reflection statements. Validity was established through authorship.
   Individual Interviews

The researchers conducted eight individual interviews with consenting students randomly selected from each class. Interviews were conducted by individual researchers allowing for the triangulation of the resulting data. Individual interviews encouraged open, honest and in-depth communication, free from both the perceived and actual social constraints of group interviews. Field notes were taken during all individual interviews and analyzed for thematic content.
   Focus Group Interviews

Focus group interviews were conducted with random participants from both the main campus and branch campus locations. In an effort to increase the research validity and transferability, these participants were not the same subjects who participated in the individual interviews. Two focus groups, consisting of five participants each, engaged in one-hour, recorded focus group interviews. All comments were transcribed and analyzed to provide insight to address the research objectives. The group interviews consisted of open-ended questions generated from previous observation, reflective analysis and individual interviews. The methodology behind the timing of the group interviews facilitated the in-depth member checks necessary to establish and improve research validity.

Results

Objective One – Psychological Aspects

Research objective one was written to address the psychological aspects of peer teaching. Overall, participants seemed to enjoy both peer teaching and being taught by peers. The overall peer teaching environment facilitated student interaction, which allowed students to assume the role of active participant. Students laughed, talked and interacted throughout the lessons, creating a warm and interactive atmosphere.

Students who engaged in active peer teaching displayed elements of metacognition. The students analyzed their own learning supported by statements such as, "I'd rather teach than learn," and, "I learn more when I teach." Through metacognition, the peer teachers also began to develop an awareness of their individual and collective learning styles. In their reflections, the peer teachers commented: "…we could have improved on that. Kind of thinking about their teaching style as well as the content that they [peer teachers] are teaching;" "…we decided that it would be better to get the information to them first, and then proceed to have them apply it."

The peer teachers also demonstrated a psychological introspective aspect of self-reflection: "I was highly disappointed in myself."; "I was very pleased and I feel that my partners felt the same." Students who engaged in peer teaching also reflected on the value of observation and the ability to learn from others. The peers who taught first felt they were disadvantaged by not being able to solicit peer feedback, garner ideas and improve their teaching: "I know at least with our group, since we were the first ones to go we really felt like the guinea pigs because we weren't sure what to expect"; "It was a pretty obvious benefit for the other groups, the later groups, they hear the comments at the end from all the groups that have gone, on what to improve on."

Surprisingly, one of the most data extensive and rich examples of the psychological aspects of peer teaching was student career formation. As mentioned previously, the course in which peer teaching occurred was an introductory teaching course, consisting of primarily freshman and sophomore students majoring in agricultural education. In regards to career formation, the students reflected: "Peer teaching is something that is wonderful in some ways because it allows us to identify the areas that we, as educators, need to work on, and perhaps decide whether or not we are actually cut-out for this particular major/career."; "Every teacher should undergo it [peer teaching] in the first year of post secondary education"; "It is very important that I 'get a feel' for the field early on."

Both peer teachers and class participants appreciated the dynamic involvement associated with peer teaching: "My favorite part of the lesson was the creativity we brought to it"; "Having students teach gives it a fresh outlook and a creative take on material"; "I was also really happy with the way students responded to the material."

The students contrasted the dynamic, active involvement of the peer teaching process with the lack of engagement they had experienced in other courses. During the focus group interviews the students expressed the differences between peer teaching and instructor involvement:

> …that's what our instructors are there to do, to lecture, put the material out, let us learn it and then have an exam about it. It is pretty cut-and-dry, straightforward, here is the material. At least with this [peer teaching] we are doing more hands on, we get into groups, we do something to apply the knowledge that we just learned, it makes it more interesting to me."

In reference to the ability of peer teachers to provide examples, one participant stated, "They could come up with examples more true to the times." Another participant, elaborating on the lack of engagement with instructors stated, "I mean if they are like 140 and they are talking about something old school, and I don't really know what they are talking about and they are using it as an example, that's going to get in my way."

Objective Two - Power Relationships and Classroom Roles

The second research objective was written to describe power relationships and classroom roles between peer teachers, students, and the course instructor. Through observation, the researchers identified a palpable change in the classroom dynamics once peer teachers assumed leadership. The peer teachers' relationship with the class appeared to be active and vibrant. There was an evident power dynamic between peer teachers and student participants. Peer teachers appeared to assume the role of power when they felt they could affect a positive or influential change in student beliefs or opinions. For example, one particular student expressed a view widely deemed by others to be racist. The peer teachers promptly engaged in an activity designed to increase diversity understanding. The students immediately directed several pointed questions in the direction of the *perceived racist* student. The peer teachers persisted in asking direct questions until the student expressed doubt in his own views. It seemed as if the peer teachers assumed power and were unwilling to allow the offending student to remain in a state of metacognitive quandary.

Further support of the classroom power relationship was expressed in the following student comments: "I thought it would be interesting to open-up a discussion, since in most classes this is not really an option."; "I actually like it [peer teaching] because you feel like you are on the same level as everyone else. You don't feel like you are pressured to hide what you want to say, you can say anything and everyone wants to share; and, it is a change from having a professor sit there and lecture you, so I like it."

Objective Three - Belonging or Engagement

The third research objective was written to examine change in student sense of belonging or engagement during the peer teaching process. Data generated from observation, interaction, reflections, and interviews, were analyzed for thematic content indicative of closeness-inducing behavioral or verbal cues. Overall, the participants, both peer teachers and students, displayed an increased sense of belonging and engagement.

Data generated during open observations supported increased sense of engagement and belonging. Open observations is a form of discourse analysis intended to allow for observation of verbal exchange, examining rate, pause, inflection, word choice, and nonverbal behavioral cues as a lens into the meaning of interpersonal interaction. Observers noticed students and peer teachers engaging in "warm and interactive, joking personal interaction." In reference to the class atmosphere during peer teaching, one student stated, "it is lighter, it is more relaxed, you are not as tense and sitting there and having to hang on every word the professor says. It's like, hey that's my friend. You can talk to them easier." Students evidenced a social politeness towards fellow students, yet paired their politeness with the expectation of respect and attention. When one student entered class late, the peer teacher stopped the class and, while "welcoming the student warmly and easily" made it very clear that punctual attendance was expected.

Researchers noted that the peer teachers were, "almost gentler with their peers, more forgiving of mistakes, and warmer in their interactions." These affective elements of communication, while inherently subtle, nevertheless pointed towards an apparent increased sense of communality or belonging. The researchers noted that the peer teachers were, "comfortable with pushing peers" and yet showed, "care and concern for their fellows."

One distinct indicator of belonging was the level of student physical contact. In most instructor-led college courses, physical contact with students is both minimized and discouraged. The peer teachers, on the other hand, repeatedly engaged in physical contact coupled with verbal praise. The researcher notes indicated that peer teachers, "tended to touch one another and pat on the back," and engaged

in verbal praise with comments such as "you are special," "that's a good question," and "you can do it." The physical contact displayed by the peer teachers was a tangible and visible representation of the sense of belonging exhibited during the peer teaching process.

Conclusions and Discussion

Students enjoyed the active engagement of peer teaching as compared to the traditional instructor-centered environment. Peer teaching is an effective way to increase student engagement and participation, facilitating a warm and interactive classroom environment. The peer teachers in this study utilized diverse teaching methods, yet constantly focused on personal interaction and relational activities specific to their age group.

Research objective one sought to describe the psychological aspects of peer teaching. Students, who were active in peer teaching, displayed increased metacognition. The development of metacognition was supported by Topping (2005) who stated, "both helper and helped should become more consciously aware of what is happening in their learning interaction, and more able to monitor and regulate the effectiveness of their own learning strategies in different contexts" (p. 638).

Active lessons, directed by peers, allowed students to analyze methods of instruction as well as the effectiveness of instruction. Utilizing peer teaching was an excellent way to introduce early pre-service teacher candidates to the practical rigors associated with the teaching profession. The process of peer teaching allows students to begin developing the knowledge, skills, and dispositions needed for successful teacher candidates.

Research objective two sought to describe the power relationships and classroom roles of students engaged in a peer teaching course. In this study, peer teaching encouraged students to openly share and participate in class discussions. When peer teachers interacted with other students, class participants felt released from the relational constraints of the typical instructor-student relationship. The openness associated with peer teaching was supported by Topping (2005) when he stated, "A trusting relationship with a peer who holds no position of authority might facilitate self-disclosure of ignorance and

misconception, enabling subsequent diagnosis and correction" (p. 632).

The third research objective was designed to describe changes to the students' sense of belonging or engagement as a result of peer teaching. Students engaged in peer teaching evidenced increased openness and comfort with their classmates. De Lisi (2002) identified a similar response when he described peer team members as, "more likely to feel comfortable with a free exchange of ideas that can lead to both deeper levels of understanding and an appreciation of another person's individuality" (p. 6). The sense of belonging during the peer teaching process, enabled learners to actively engage in the type of knowledge construction espoused by both Vygotsky and Piaget (O'Donnell & O'Kelly, 1994).

Allowing students the freedom to instruct peers increases physical and verbal indicators of student belonging. The increased physical contact, and the readiness of verbal praise, served to alter the traditional classroom structure, provided the emotional freedom conducive to increased engagement (Brophy, 2004; Deci & Ryan, 2002).

Recommendation for Further Research

While the current research was designed to examine the psychological aspects of peer teaching, further research needs to be conducted to highlight specific cognitive aspects of peer teaching. Do students display a higher degree of learning with peer teachers? Is there a difference in the retention of information presented by peers? Perhaps by taking a chance and allowing students to assume an active role in the classroom, instructors will be able to create an environment that can positively enhance the learning of all students.

Recommendations for Practice

The qualitative methodology utilized in this study was intended to provide descriptive detail as to the practical implications of peer teaching. Dooley (2007) advocated for the use of qualitative research in agriculture and stated, "Through qualitative approaches, the researcher is able to contribute theory grounded in practice to enhance the conceptual framework of the discipline" (p. 40). In an effort to ground the

theoretical aspects of peer teaching firmly in practice, the participants and researchers generated the following recommendations.

During the focus group interviews, the students expressed feedback as to several areas for potential improvement of the peer teaching process. Students recommended peer teaching groups of two students as opposed to three due to the difficulty of separating the teaching load with three individuals. The peer teachers recommended keeping the 20-minute instructor follow-up to allow for clarity and surety of course content. One participant recommend, ". . . I think it is also important that the instructor kind of lays the foundation of the class, so that you know the basis of it and how to do peer teaching." Continued instructor input in the course, prior to and during the peer teaching experience, is essential. The students appreciated the willingness of the instructor to provide direction prior to the peer teaching as well as direct feedback immediately following the lesson. While the peer teachers did receive minimal group feedback (5-10 minutes) following a lesson, they indicated a desire for additional time allocations for group feedback.

One recommendation, consistent with other peer-assisted learning studies, is that students need to be provided direction on identifying essential course content (Wadoodi & Crosby, 2002). The students expressed difficulty in identifying the "things that are important."

Some of the peer teachers sought instructor input in identifying essential content. In turn, a majority of the peer teachers, perhaps recognizing their own weakness, also provided the students with some form of detailed or guided notes.

Care should be taken in the development of testable material based on the peer teaching process. The current researchers requested that the peer teachers develop a list of test questions based on their assigned textbook chapter. Students, being resourceful by nature, started sharing questions with their classmates, resulting in a decrease in note-taking. One possible strategy to overcome this administrative challenge is to allow student-generated questions to account for a specified percentage of the course final. The course instructor allowed time, at the conclusion of the peer teaching lesson, to provide additional content and expound on potentially testable material.

Classroom modifications take time and are often risky. Yet, peer teaching provides an excellent modification strategy with a controllable risk. If administrative and procedural elements are in place, peer teaching can provide an excellent opportunity for student metacognition, and self-reflection, while facilitating increased feelings of student belonging and engagement.

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