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ORIGINAL RESEARCH

Perceptions of Participants Involved in Peer Assisted Learning in a Professional Athletic Training Education Program

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Objective: The objective of this study was to examine the perceptions, values, and experiences of individuals involved in peer assisted learning (PAL) in the clinical setting of an athletic training education program.

Design and Setting: A qualitative research approach borrowing from grounded theory was used.

Subjects: 15 participants, consisting of 9 athletic training students (ATS) and 6 Approved Clinical Instructors (ACIs), participated in this study.

Measurements: Semi-structured interviews were recorded and transcribed verbatim for analysis. The interview data was analyzed inductively, borrowing from the grounded theory approach, utilizing both open and axial coding. Furthermore, a peer review, member checks by the participants, and the use of multiple data sources were used to establish trustworthiness.

Results: Six main themes emerged from the analysis: 1) Defining PAL; 2) Role recognition; 3) Preference for active informal learning; 4) Value of PAL; 5) Peer Limitations; and 6) Recommendations related to PAL.

Conclusions: Overall, this study provides an in-depth understanding of athletic training students' and ACIs' perceptions of PAL, and supports the conclusion that athletic training students in this program prefer to experience active and informal educational exchanges that occur naturally in the clinical setting rather than more formal learning experiences. These results suggest that PAL is beneficial and worthwhile.

Key Words: Peer learning, peer education, mentoring, peer teaching, qualitative research

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Perceptions of Participants Involved in Peer Assisted Learning in a Professional Athletic Training Education Program

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Peer assisted learning (PAL) is an active learning approach where students work together to problem solve and learn by observing and interacting with each other.[1,2] A variety of terms have been used interchangeably to describe peer assisted learning, including peer education, peer teaching, peer learning, and peer tutoring. Regardless of the term used, the concept involves using peers in a system of instruction to promote learning and to learn by teaching.[2,3] Students involved in PAL have no formal educational instructional training, but through engagement with their classmates, they help each other learn and thereby learn themselves.[2]

The practice of PAL is supported by Bandura's social learning theory.[4] The central tenet of social learning theory is that individuals learn vicariously from observing the behaviors of others. More specifically, learners observe an individual's behavior, stores information regarding his/her performance, and then uses that information to guide their own future behaviors. While vicarious learning has been found to increase observing students' self-efficacy[5] the person modeling the behavior is also affected by the same experience.[6,7] Research[7] has demonstrated that individuals learn more from models similar to themselves. In addition, students who observed peer models had higher self-efficacy for both learning and achievement compared to those who observed teacher models.[8] Peers can act as a powerful force in student learning and the development of self-efficacy,[5] which supports the use of PAL in the educational setting.

PAL has been successfully used in various allied health care academic programs' clinical settings.[9,10-13] General benefits of PAL documented in allied health fields other than athletic training, include an increased knowledge and skill level,[2,3,10-12] increased confidence in performing skills,[2,11-13] increased ability to communicate effectively with others,[3,10,13-15] decreased anxiety when working with peers,[10,13,16] improved test scores and course performance,[2,3,11,17] as well as increased opportunities to work collaboratively with other students.[2,10,11] Notably, research in these allied healthcare fields indicates that students who teach others gain a more thorough understanding of the information because the process of teaching requires a deeper level of understanding as well as the ability to express and communicate that knowledge to other individuals.[13-15] While these benefits have been researched and well-documented in other allied health fields, there are very few studies investigating the benefits of PAL in athletic training education programs.

Henning's dissertation[1,16] is one of the few published studies on peer assisted learning in athletic training. Her work indicated that almost half of the students stated they learned at least a small amount of their clinical skills from other athletic training students, while many of them indicated that they practiced a majority of their clinical skills with other students. Henning concluded that peer education is occurring in the athletic training clinical education setting and should be developed and incorporated as a purposeful component of athletic training education programs to enhance learning and retention. Furthermore, she suggested that when compared to the term peer education, the term peer assisted learning more appropriately describes these peer educational exchanges because it emphasizes the active nature of students helping each other learn.[1,16]

Recent changes within athletic training education warrant the use of PAL in our programs. First, ACIs are faced with the pressures of increased workloads and responsibilities while supervising athletic training students.[1,18-20] As a result, approved clinical instructors often find themselves encountering some role stress as they are pulled between multi-faceted job responsibilities and patient care. For instance, the ACI may often complete a responsibility or task that does not immediately involve the athletic training students, such as speaking to a physician on the telephone in the athletic training room. Although the students are being supervised, they may find themselves not actively engaged in useful learning interactions and experience "down time."[1,18,20] Since ACIs have numerous demands on their time outside of education, it is increasingly important that athletic training students take advantage of down time in the clinical setting and interact with each other. Second, PAL is ideal for the current generation of students who prefer collaboration and group participation in learning.[21] Therefore, PAL is a resource that can provide important active learning experiences for students in the clinical education setting.

Problem Statement

Since other allied health professions have found positive results related to student learning that supports the use of PAL in the clinical setting,[2,10-13,19] the purpose of this study was to examine athletic training students' and ACIs' perceptions of PAL, including their experiences with PAL and the value of PAL in the athletic training clinical education setting. It is important to learn more about PAL in the athletic training setting, and specifically examine the perceptions of individuals involved in the athletic training setting including students and ACIs. Students can provide detailed descriptions of how they use PAL to promote learning, whereas ACIs are in unique positions to encourage the use of PAL. Therefore, to gain a rich description of both students' and ACIs' perceptions of peer assisted learning, a qualitative study was designed.

Research Questions

The following research questions were used to guide this study:

1. How do athletic training students and approved clinical instructors describe and define peer assisted learning?

2. How do peers experience educational exchanges with each other in an athletic training clinical education setting?

3. What perceptions do athletic training students and approved clinical instructors have about peer assisted learning?

The following operational definition of PAL proposed by Henning, Weidner, and Marty[19] was used to guide the study: Peer assisted learning is "the act or process of gaining knowledge, understanding, or skill from students that are either at different or equivalent academic or experiential levels."[19 (p.85)]

Methods

Qualitative research methods were employed in this study to specifically focus on the perceptions and experiences of the participants. As Thomas, Nelson and Silverman[22] state, qualitative methods are used to understand the "essence" of the experience to the participants and provide a rich and thick description of the phenomenon. The sample is usually small and purposive due to the in-depth data generated using qualitative methods.[23] Pitney and Parker[24] argue that the field of athletic training has witnessed an increase in qualitative methods recently, specifically when examining educational and professional development issues. Because examining the *perceptions* of participants in an *educational setting* was the focus of this study, the use of qualitative methods was ideal.

Principal Investigator's Statement

In addition, the topic of PAL was of primary interest to the principal investigator because of her previous experience with PAL as a student and an instructor in the didactic and clinical educational aspects of athletic training education. More specifically, the principal investigator was an instructor and an ACI in the ATEP where this study was conducted. She continually encouraged students she supervised and instructed to participate in PAL because she had the opportunity to experience PAL firsthand as an undergraduate athletic training student and found this type of learning to be extremely valuable in her educational experience. She also noticed athletic training students using PAL without formal encouragement or instruction by their ACI.

Participants

Fifteen participants from a state university athletic training education program in the midwest area of the United States were interviewed as part of this study. Participants consisted of 9 athletic training students who were formally admitted into the athletic training education program (60%) and 6 approved clinical instructors (40%; ACIs) involved in the program. The participants were all white, Caucasian individuals who consisted of 7 males and 8 females, with an age range of 19 years to 44 years (M = 20.22 years; SD = 1.09; see Table 1 for participant demographics). There were no individuals of another race involved with the athletic training education program at the time this study was conducted. The professional experience of the ACIs, in which four of the six were alumni, ranged from 2 to 17 years. The athletic training students had no formal training in PAL and were selected from three academic levels to participate in the interview process. More specifically, three students at the sophomore or entry-level, junior, and seniors levels were selected. Using participants at each program stage enabled us to examine perceptions and experiences of peer teaching and peer learning specific to various levels of academic preparation. The students were enrolled in a variety of athletic training classes at the time of the interviews including Lower Extremity Evaluation, Care and Prevention of Athletic Injuries, and Therapeutic Modalities.

Procedures

After approval from the Institutional Review Board, in-depth, semi-structured interviews were completed.[25] The interview questions were based on Henning's research[1,16] and the principal investigator's experience with PAL as an ACI, and sought to explore the participants' perceptions regarding PAL, including their experiences with and the value of PAL in athletic training

Table 1. Participant Demographic Information

Pseudonym	Gender	Age	Grade/Years in ATEP	Role in ATEP
Jen	Female	21	Senior	ATS
Kathy	Female	20	Junior	ATS
Angie	Female	19	Soph	ATS
Julie	Female	19	Soph	ATS
Erika	Female	20	Junior	ATS
Brian	Male	21	Senior	ATS
Dina	Female	22	Senior	ATS
Jason	Male	21	Junior	ATS
Chad	Male	19	Soph	ATS
John	Male	37	3 years	ACI/ Alumnus
Rob	Male	25	2 years	ACI/ Alumnus
Sue	Female	35	2 years	ACI/ Alumnus
Kevin	Male	40	10 years	*ACI
Erin	Female	25	1 year	ACI
Kent	Male	44	17 years	*ACI/ Alumnus

*Prior to the introduction of the ACI this person served as a clinical instructor in the ATEP.

education programs (see Table 2 for questions). When necessary during the interview process, additional prompts were given to stimulate thought elaboration and detail. [23] Four pilot interviews were conducted with 3 students and 1 ACI to acquire feedback on the interview guide and allow the principal investigator to gain experience with the interview format. Modifications to the interview guide were made after the pilot interviews to ensure question clarity. Each interview was conducted by the principal investigator in a private office on campus in a convenient location for the participants. Once consent was obtained and the study was explained to each participant, the interview was conducted. The duration of each interview was approximately 45 minutes. The principal investigator took notes during the interviews and the interviews were tape-recorded and transcribed verbatim. A pseudonym was given to each participant to maintain confidentiality. Interviews were conducted until the researchers reached a saturation point where no new data emerged.[25] A saturation point was reached after 10 interviews, but 5 more interviews were conducted to ensure saturation was reached.

Data Analysis

The interview data was analyzed inductively using grounded theory[23-25] open coding and axial coding to develop themes.[23,25] Open coding involves the process of selecting and naming categories from the interview transcripts. This process included listening to the audio tapes, reading the transcripts thoroughly, highlighting key phrases on the transcripts, and writing conceptual labels in the margins of the transcripts. These conceptual labels were constantly compared to each other and developed into like categories. After establishing the like categories with open coding, the data were re-evaluated and rearranged using axial coding by comparing the like categories to reduce the overall number, show a relationship among them, and place them into themes.[24-27] For example, phrases addressing the importance of the PAL experience were grouped into the like categories such as knowledge, confidence, and communication and then arranged into the theme labeled "Value of PAL." Themes were developed based upon the frequency of comments and significance of comments that occurred during the interview process. More specifically, at least two-thirds of the participants discussed content associated with each theme.

Establishing Trustworthiness

With any qualitative research, it is essential to establish trustworthiness to provide credibility of the research and decrease researcher bias.[23-25] As such, the following three procedures to reduce error were used in this study: triangulation, peer review, and member checks.[23-25] Triangulation was established by using multiple data sources which included interviews with athletic training students and ACIs. A peer review of the interview transcripts and themes was completed by a colleague with experience in the areas of qualitative research and athletic training to ensure they were sensible and accurate. The peer reviewer acknowledged that the themes represented the overall findings of the interviews. Finally, member checks allowed participants the opportunity to check data, interpretations, and conclusions to aid in establishing credibility. Member checks were accomplished by emailing the transcripts and themes to the participants to

Table 2. Semi-structured Interview Guide Questions

- What do you call the educational exchanges that occur between peers in the clinical athletic training education setting?
- What term or terms are most often used in describing educational exchanges that occur between you and your peers?
- How do peer teaching/learning activities most often occur in the athletic training clinical education setting?
- Describe a positive experience that you have had (or observed) with athletic training students during peer educational experiences.
- Describe a negative experience that you have had (or observed) with athletic training students during peer educational experiences.
- What makes learning with your peers effective and/or ineffective in the clinical education setting?
- What is peer learning? What is peer teaching?
- In what ways do you think learning with your peers is valuable?
- What do you think are the benefits of PAL for the student serving in the role of a peer teacher?
- What do you think are the benefits of PAL for the student serving in the role of a peer learner?
- What do you perceive are the essential qualities that are important in fulfilling a role as a peer involved in helping others peers learn?
- How do peer teaching/learning activities most often occur in the athletic training clinical education setting?
- Tell me how your learning activities have changed in the clinical setting during your time in the athletic training program.
- In what way does the learning environment influence the ways in which you work together with your peers?
- What would you change about the current state of peer assisted learning in your current athletic training education program?
- In what way has working with peers helped you gain professional behaviors, skills and knowledge?

review for accuracy. The participants were given the opportunity to respond with corrections and comments. Eleven of the participants responded with an acknowledgement of receiving the email. None of the participants provided any corrections or had any comments regarding the transcripts. Quotes, or a selection of the interviews, are provided below to exemplify the themes.

Results

Six main themes emerged from the interview data: 1) Defining PAL; 2) Role recognition; 3) Preference for active informal learning; 4) Value of PAL; 5) Peer Limitations; and 6) Recommendations related to PAL.

Defining PAL

An aim of this study was to identify and define peer assisted learning based on the perceptions of the participants. All of the participants described a peer as someone having similar knowledge, training and experiences. For example, Angie, a sophomore student, stated, "A peer is someone around the same age and having a similar level of knowledge as another individual." When asked what they call the educational exchanges between peers, 12 of 15 participants indicated that there was no formal term used to describe these exchanges, whereas 3 participants indicated phrases such as "studied together," "study groups," or "peer teaching." For example, Dina, a senior student, commented, "I don't really have a term for [it], if I had to tell someone what I was doing, I would say that we studied together." After describing the concept of PAL to each participant[1] so they had a common understanding of PAL during the remainder of the interview, all but one of the participants had heard of the general concept previously. For example, after being introduced to PAL, Brian commented that he thought, "Peer assisted learning occurs when students of similar age or education help each other work through the material to understand it better."

Role Recognition

Two primary roles within PAL emerged from the findings: peer learning and peer teaching. The way the participants described both peer learning and peer teaching varied depending upon the participants' number of semesters in the athletic training program. Specifically, 10 of the 15 participants stated that the roles evolved from a peer learner to a peer teacher as the student progressed through the program. All of the students (n = 9) indicated that at some point they all participated as peer learners during educational exchanges with other peers. Likewise, many (n=8 of 9) of the student participants perceived peer learning to involve a student who is less advanced or knowledgeable working with another peer who is more advanced or knowledgeable. For example, Erika, a junior student, said, "Every semester I feel I have more of a role as a peer teacher because each semester I learn more and progress through the program. I feel it is my responsibility to help others as I have been helped." Whereas, Julie, a sophomore student, suggested she was "definitely" a peer learner because she was "new in the program and didn't know a whole lot yet." This same participant thought that her role would involve more peer teaching as she progressed through the program. She stated, "As I progress through the program, I expect to be more involved in peer teaching." Furthermore, all of the student participants (n=9) agreed that peer teaching occurred when a peer takes the lead role by demonstrating a skill to help other peers gain knowledge or to aid in the reinforcement of their learning.

Preference for Active, Informal Learning

All of the participants (N=15) indicated during the interviews that most of the educational exchanges among peers involved active and/or collaborative learning that was informal in nature. For example, Chad, a sophomore student, described the importance of the active, informal learning that occurred as: "It's just nice to do something that just happens… It is less stressful to the students and gets them actively involved with each other. Sometimes it is less intimidating asking another student for help instead of your ACI and since I am a newer student, I seem to ask questions all of the time." Kathy, a junior student, suggested the value of PAL is the active learning that occurs as a result of participating in it:

> *It allows for hands-on, active learning in real life situations which really helps me learn the skills. It also really encourages me to teach others because the more times I do something or demonstrate something, the better I remember it. This is one of the most unique aspects of the athletic training education program as it allows us to gain lots of hands-on experience. You have real injuries, real problems, and real issues to deal with that you don't get in the classroom.*

Regarding the informal nature of PAL, Brian, a senior student, described most of his PAL experiences as "spur of the moment" activities that typically occurred when activity slowed down in the clinical setting and students had time to work together without frequent interruptions. Other situations that the participants described in which PAL occurred include: when an athlete came in unexpectedly with an injury that could be evaluated by an athletic training student, when an ACI assigned a task or activity to be completed, or when an upper-level student was working on a skill that could be demonstrated to another student.

Value of PAL

All of the participants (N=15) expressed in some way that they believed PAL to be useful and beneficial. PAL was viewed by the participants as a way to help foster better relationships with other peers by working together toward the common goal of improving their skills. The participants suggested some of the benefits of PAL for the peer teacher and the peer learner included: increased knowledge (n=14), improved confidence (n=11), better communication skills (n=10), improved comfort level (n=8), stronger relationships with peers (n=6), decreased intimidation (n=5) and anxiety (n=6) as well as increased transfer of learning from classroom and textbook information to real life practice (n=5). For example, Chad, a sophomore student, indicated he felt that PAL was valuable because it was a more comfortable setting to learn where he felt more relaxed. He stated:

It is a lot easier for me because I can work with somebody that is close to my level and is a lot less intimidating than having to go ask somebody that is a certified athletic trainer. Because I am not as intimidated I feel like I can focus on learning and retain the information better. Sometimes when I work with an ACI, I am really nervous about what I am doing and I often forget what I am trying to learn. I am so worried about whether I am doing the right or wrong thing and what the ACI is going to think of me if I mess up. However, with a peer, I am not as worried and much more relaxed.

A number of factors emerged related to the effectiveness of PAL including: the ACI(s) (*n*=11), the sport (*n*=9), a comfortable learning environment (*n*=8), other peers and their willingness to participate in PAL (*n*=8), as well as the more experienced peer's knowledge (*n*=2), understanding of the material (*n*=9), and confidence (*n*=6). For example, Angie, a sophomore student, stated that the ACI plays a role in the effectiveness of PAL. She stated:

There are ACIs who are better at encouraging PAL and help provide opportunities for us to work with our peers. My ACI often encourages us to work with our peers during slower times in the clinical setting. This encouragement was especially helpful when I first got into the program as this created an environment where newer students could be actively engaged.

Peer Limitations

When asked, all of the participants (*N*=15) described some of the peer limitations of PAL, although it is important to note that the students stressed these limitations do not occur often. These limitations included peers' lack of knowledge, over confidence in their knowledge, a lack of maturity, inability to teach the material, and unwillingness to participate in the PAL process. Twelve of the 15 participants suggested a main problem with PAL occurred when peers tried to teach a concept they were not sure about or when they taught a skill incorrectly. A few students had concerns about the accuracy of the information presented by their peer regardless of the academic level (i.e., senior). Jen, a senior student, described this as the major reason PAL can be ineffective:

It can cause students to have negative learning experiences and lose trust in each other. Sometimes it is not so much a lack of knowledge but maybe a lack of confidence which leads to the peer teacher being too vague with their explanation.

Several participants also suggested PAL tends to be ineffective when peer teachers act like they know more than they really do (*n*=8), or when the peer teacher is unable to explain the information in a way that helps the peer learner understand (*n*=6). In addition, PAL activities were also perceived to be ineffective when peer teachers lack confidence (*n*=7) and maturity (*n*=5), or when peer learners are not willing to participate in the learning activities (*n*=4). Julie, a sophomore student, commented on a negative learning experience that she had in one of her clinical rotations:

I was completing a task as instructed by my ACI when an upper level peer indicated I was completing the task incorrectly. The peer student then proceeded to demonstrate the task for me so I could perform it correctly. A few minutes later the ACI finished with a patient and came over to ask how I was doing. He noticed how I was performing the task and provided feedback to me regarding how to properly complete the task. I told him I had been doing it the way he instructed but the senior student indicated I was performing it wrong [and therefore I changed how I was doing the skill]. The situation left me a little irritated and confused because I don't want to learn things incorrectly, so it tends to decrease my trust in my peers.

Recommendations Related to PAL

All of the participants (*N*=15) suggested their peer learning interactions while in the clinical setting were good and they had some trouble initially suggesting improvements that could be implemented related to PAL. However, all participants eventually offered suggestions for improvement including incorporating informal PAL activities more often in the clinical experience (*n*=6) and encouraging ACIs to promote PAL more frequently (*n*=9). For example, Brian, a senior student, recommended that PAL be promoted more among pre-athletic training students so that they understand what it is and engage in PAL sooner. He added, "It might be beneficial to actually have someone from the athletic training education faculty introduce it in class and then have the ACIs promote it in the clinical setting by encouraging their assigned students to engage in it informally." Jason, a junior student, stated, "I would recommend to all ACIs to try and remember to encourage their students to work with their peers on evaluations and scenarios as much as possible until they are comfortable and relaxed enough to perform various skills without much help."

Discussion

Overall, this study provided an in-depth understanding of athletic training students' and ACIs' perceptions of PAL. Although previous research indicated that PAL was occurring in the clinical education setting, this study provides a richer and more detailed account of student and ACI's experiences with PAL.[1,16] This study supports and extends previous research on the effectiveness of PAL in the clinical education setting within athletic training.

How do athletic training students and approved clinical instructors describe and define peer education?

The results indicated that all but one of the participants (*n*=14) in this study view peers in athletic training education as individuals having similar knowledge, training, or experiences, which is similar to the definitions of a peer available in the literature.[2,3] Although the majority (n=12) of participants in this study indicated that no specific term was used to describe the educational exchanges among peers, it is still important that clinical instructors and faculty use the term PAL when promoting peer educational exchanges in the clinical setting. A main finding of this study suggests that

students perceive several benefits of PAL, and that using a term such as PAL, would allow consistent language between the students, clinical instructors, and ATEP faculty members. When the participants were asked to describe educational exchanges with their peers, each in their own way described it as a learning tool where students of similar backgrounds or levels help each other work through course materials to understand concepts better. As a result, students also learn to become more confident in their own abilities, supporting Bandura's social learning theory. These findings are consistent with the descriptions of PAL found in the literature which details the basic idea behind peer education as one where individuals help each other gain a better understanding of the specific athletic training content.[1,2,16,19]

How do peers experience educational exchanges amongst each other in the athletic training education setting?

Many participants (*n*=10 of 15) believed that the roles evolve from a peer learner to a peer teacher as the student progresses through the athletic training education program. The upper level students each described participating in PAL activities most often as a peer teacher while the newer students in the athletic training education program described participating in most PAL activities as a peer learner. This finding seems to be consistent with the descriptions of peer learning found in the literature. For example, Knight[14] describes a peer learner as a less advanced student receiving some sort of instruction in clinical skills from a more advanced student who has additional experience. The perceptions of peer teaching also seemed to be similar to descriptions found in the literature which identified a more advanced or more experienced student being involved in the instruction of a less advanced student by demonstrating, practicing, correcting skills, and providing feedback.[14,16]

What perceptions do current and former athletic training students and approved clinical instructors have about peer assisted learning?

This study demonstrates that peer assisted learning created meaningful learning experiences. Many of the *peer teacher* benefits described by Kuhl[28] were described by the participants in this study, including increased confidence, increased knowledge, overall reinforcement of knowledge, improved relationships with peers, and opportunity to review and reinforce athletic training competencies and proficiencies. In addition, our study also identified the benefits of PAL for the individuals serving in the role of a *peer learner*. Some of the perceived benefits for the peer learner found in our study included: decreased intimidation and anxiety, improved comfort level, increased confidence, increased knowledge, improved communication skills, increased trust in peers, improved relationships reinforced learning as well as increased transfer of learning from classroom and textbook information to real life practice, and application in the clinical education setting. Previous studies of PAL have demonstrated similar benefits.[10,12,16,17,29,30]

Our results are similar to PAL studies conducted by Henning[1,16] and Popp[31] who reported that students gain a more thorough understanding of clinical knowledge and skills as a result of participating in PAL and were less anxious and more confident when practicing skills with other students. Students engage in PAL activities because there are many benefits in doing so, primarily that of participating in active, informal learning activities that will eventually lead to enhanced learning and better educational experiences.

More specifically, this study as well as the few other studies that have been conducted regarding PAL in athletic training education[1,16,31] supports Bandura's social learning theory[4] by demonstrating an increase in students' confidence and self-efficacy.[5] These findings support the use of PAL and suggest that peers can act as a powerful force in student learning, positively impacting students' future performance.

There is much information on the benefits and value of PAL, but a lack of research and information addressing how PAL can be effective or ineffective. All of the participants in this study described the limitations of PAL, although they were clear to point out these limitations do not occur frequently. The majority of the participants suggested a main problem with PAL occurred when peers tried to teach a concept they were not sure about or when they taught a skill incorrectly.

Implications for Practice

Based upon our PAL study and previous research findings, it is apparent that encouraging opportunities for students to engage in PAL may be a useful educational tool that educators can encourage with students.[1,16,31] Athletic training educators, including faculty, ACIs, and even athletic training students, should be aware of the perceived benefits of peer assisted learning to learners within athletic training education programs. The findings from our study indicated that the participants believed the PAL activities occurring in the athletic training clinical education setting were beneficial and worthwhile. Although not investigated in this study, the use of this type of active, informal learning strategy may significantly impact the success of students involved in athletic training education.

From our experience in athletic training as well as research within the field, we suggest that athletic training educators implement the following guidelines when implementing PAL.[1,16,31] First, we recommend formally introducing and discussing PAL in the didactic setting with students in the athletic training education program. Discussion should include a description of the concept, benefits, teaching and learning styles. Strategies for incorporating peer learning in the clinical environment should also be shared with the students, and they should be encouraged to engage in PAL. By introducing PAL in the classroom, the instructor will be present to ensure peers are learning and teaching skills correctly. In addition, simple PAL activities can be introduced to the class to get students actively involved in understanding the concept. For example, ACIs can encourage students to work together on their proficiencies/competencies such as taking blood pressure or reviewing palpations and special tests. Ideally, the introduction of PAL should occur at the beginning of an athletic training student's

educational process, such as during the pre-athletic training observational process. Secondly, we recommend that PAL be briefly reviewed by ACIs and their assigned athletic training students during their orientation to the specific clinical site. This will help to encourage the use of PAL during the clinical rotations and prevent peers from teaching skills incorrectly. Furthermore, the ACIs should encourage PAL informally and not force PAL with the athletic training students, thus making the environment awkward, unnatural, and a deterrent from learning.

Limitations of the Study and Recommendations for Future Research

The findings from this study support the perceived benefits of PAL and the use of PAL in athletic training clinical education settings. There are at least two limitations of this study, however, that are important to acknowledge. Although methods of trustworthiness (i.e., peer review and member checks) were employed in this study to reduce error the first author's experiences and biases could have impacted the results of this study. In addition, only one athletic training education program was involved in this study and the experiences of the athletic training students at this university may be different from other students at other universities. Therefore, future research should confirm and extend the current study.

Future studies should evaluate the use of peer education over a longer time frame, such as over the course of formal admittance into the athletic training education program until the completion of the program. Furthermore, it would be beneficial to examine the effects of implementing formal classroom instruction concerning PAL, including teaching methods, teaching and learning styles, effective PAL activities, and various ways to informally implement those activities in the athletic training clinical education setting because this information could further enhance educational exchanges amongst peers. It would also be important to more closely examine self-efficacy and how it is related to the PAL experience in athletic training. For example, research outside of athletic training suggests that students who observed peer models had higher self-efficacy than those who observed teacher models.[8] A similar study could be designed within athletic training and could provide insight into the importance of PAL. Lastly, it would also be valuable to qualitatively examine the perceptions of individuals regarding PAL in other athletic training education programs to determine if the findings of this study are similar within other programs.

References

1. Henning J. *Exploration of Peer Education in Athletic Training Clinical Education*. Unpublished doctoral dissertation, Ball State University; 2002.
2. Topping K, Ehly S. *Peer-Assisted Learning*. Mahwah, NJ: Lawrence Erlbaum Associates; 1998.
3. Goodlad S, Hirst, B. *Peer Tutoring*: *A Guide to Learning by Teaching*. London: Nichols Publishing;1989.
4. Bandura, A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol Rev*. 1977;84:191–215.
5. Bandura, A. *Self-efficacy: The Exercise of Control*. New York: Freeman. 1997.
6. Chan, JCY, Lam, S. Effects of competition on students' self-efficacy in vicarious learning. *Brit J Educ Psychol*. 2008;78:95-108.
7. Braaksma MAH, Rijlaarsdam G, van den Bergh H. Observational learning and the effects of model-observer similarity. *J Educ Psychol*. 2002;94:405–415.
8. Schunk, DH, Hanson AR. Peer models: Influence on children's self-efficacy and achievement. *J Educ Psychol*. 1985;77:313–322.
9. Aviram M, Ophir R, Raviv D, Shiloah M. Experiential learning of clinical skills by beginning nursing students: "coaching" project by fourth year student interns. *J Adv Nurs.* 1998;37(4):228-231.
10. Bos S. Perceived benefits of peer leadership as described by junior baccalaureate nursing students. *J Nurs Educ.* 1998;37(4):189-191.
11. Iwasiw CL, Goldenberg D. Peer teaching among nursing students in the clinical area: Effects on student learning. *J Adv Nurs.* 1993;18(4):659-668.
12. Escovitz ES. Using senior students as clinical skills teaching assistants. *Acad Med.* 1990; 65(12):733-734.
13. Vaidya SR. Improving teaching and learning through peer coaching. *Education*. 1994; 115(2):241-245.
14. Knight KL. *Assessing clinical proficiencies in athletic training: A modular approach*. 3rd ed. Champaign, IL: Human Kinetics; 2001.
15. Rubin L, Herbert C. Model for active learning. *Coll Teach.* 1998; 46(1):26-30.
16. Henning JM, Weidner TG, Jones J. Peer-assisted learning in the athletic training clinical setting*. J Athl Train*, 2006;41(1):102-108.
17. Trevino FM, Eiland DC. Evaluation of a basic science, peer tutorial program for first- and second-year medical students. *J Med Educ.* 1980;55:952-953.
18. Weidner TG, Henning JM. Role strain in collegiate athletic training approved clinical instructors. *J Athl Train.* 2008;43(3):275-283.
19. Henning JM, Weidner TG, Marty MC. Peer assisted learning in clinical education: Literature review. *Athl Train Educ J*. 2008;3(Jul-Sep):84-90.
20. Brumels K, Beach A. Role orientation of certified athletic trainers at institutions of higher education. *Athl Train Educ J*. 2008;1(Jan-Mar):5-12.
21. Monaco M, Martin M. The millennial student: a new generation of learners. *Athl Train Educ J*. 2007;2(Apr-Jun):42-46.
22. Thomas JR, Nelson, JK, Silverman, SJ. *Research Methods in Physical Activity*. 5th ed. Champaign, IL: Human Kinetics; 2005.
23. Creswell JW. *Qualitative Inquiry and Research Design: Choosing among Five Traditions.* Thousand Oaks, CA: Sage Publications; 1998.
24. Pitney WA, Parker, J. Qualitative research applications in athletic training. *J Athl Train*. 2002;34(4 Supplement):S168-S173.

25. Denzin NK, Lincoln YS. *The SAGE Handbook of Qualitative Research.* Thousand Oaks, CA: Sage Publications; 2005.
26. Strauss A, Corbin J. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. 3rd ed. Newbury Park, CA: Sage Publications; 2007.
27. Bogdan R, Biklen S. *Qualitative Research for Education: An Introduction to Theories and Methods*. 5th ed. Boston, MA: Pearson Education Group; 2003.
28. Kuhl GD. The other curriculum: Out-of-class experiences associated with student learning and personal development. *J Higher Educ.* 1995;66:123-155.
29. Walker-Bartnik LA, Berger JH, Kappelman, MM. A model for peer tutoring in the medical school setting. *J Med Educ.* 1984;59(4):309-315.
30. Ebbert MR, Morgan PM, Harris IB. A comprehensive student peer-teaching program. *Acad Med.* 1999;74:583-584.
31. Popp JK. *The Effect of Peer Education on Learning and Performing Athletic Training Psychomotor Skills*. Unpublished dissertation, Ball State University; 2005.