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Clinical instructional strategies in athletic training education.

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CLINICAL INSTRUCTIONAL STRATEGIES IN ATHLETIC TRAINING EDUCATION

A Dissertation Presented

by

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ABSTRACT

CLINICAL INSTRUCTIONAL STRATEGIES IN ATHLETIC TRAINING EDUCATION

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Objective: The purpose of this study was to gain an understanding of teaching strategies used by approved clinical instructors (ACI) to facilitate student learning during clinical experiences. **Design and Setting:** A qualitative case study design was used to examine the questioning skills of ACIs. **Subjects:** Participants consisted of eight ACIs and 24 athletic training students (ATS) affiliated with an Athletic Training Education Program. **Measurements:** Data consisted of: 23 field observations/audio recordings, eight ACIs interviews, and 64 stimulated recall interviews with ATS and ACIs. Data were analyzed through open, axial, and selective coding and coding for process. Cognition level of questions posed by ACIs was analyzed using a Question Classification Framework (Sellappah et al, 1998). **Results:** Three themes emerged. Theme 1: ACIs in Athletic Training: training technicians or

promoting problem-solvers. Theme 2: Creating and nurturing learning relationships to establish enriching clinical learning experiences. Theme 3: Cognitive engagement of the learner: active or passive participant. **Conclusions:** The affective and cognitive tone of the clinical learning environment appears to be related to ACIs beliefs and attitudes, ATS active or passive participation in the experience and the strength of the learning relationship between the ACI and the ATS. ACI selection and utilization of teaching and questioning strategies is related to ACI beliefs and attitudes toward clinical education. ACIs who identify as ACI as athletic training educator tend to utilize student centered teaching strategies that support student exploration and creativity. ACIs that identify as ACI as service provider tend to utilize instructor centered teaching strategies that support student identification and replication of athletic training skills and knowledge. **Implications:** ACIs use of strategic questioning and student centered teaching strategies appears to be strongly related to the ACI's beliefs and attitudes toward clinical experiences and his or role as an ACI. A shift away from apprenticeship learning environments toward problem-solving learning environments may require a shift in ACI beliefs and attitudes.

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CHAPTER 1

INTRODUCTION

Introduction

Within professional education programs in athletic training, occupational therapy, nursing and medicine, clinical field experiences provide opportunity for students to synthesize individual educational competencies into complex sets of clinical knowledge and behaviors (Benner & Wrubel, 1982; Boney & Baker, 1997; Irby, 1994; Stafford, 1986; Starkey, Koehneke, Sedory, & Turocy, 2001). During clinical field experiences, students begin to develop professional attributes and become acculturated into their respective profession (Starkey et al, 2001). The clinical instructor or supervisor guides the student through the clinical experience (NATA, 2003; Weidner, Trethewey & August, 1997). In athletic training education programs (ATEP), the role of the clinical instructor is to assist the student in synthesizing athletic training educational competencies into the desired clinical outcomes (Starkey et al., 2001; O'Conner, 2001).

Clinical instructors are considered content experts (Starkey et al., 2001; Draper, 1989). While having content knowledge is seen as vital for delivering quality clinical instruction, pedagogic knowledge appears to be of equal

importance (Fothergill-Bourbonnais & Higuchi, 1995; Irby, 1994; Lauber, 2002; Laurent & Wiedner, 2001). Of the 1,237 educational competencies included within the ATEP curriculum, only one relates to pedagogy (NATA, 1999). Therefore, students graduating from ATEP curriculums who wish to become clinical instructors have a limited pedagogic background from which to draw.

Statement of Problem

Researchers in nursing, medicine, physical therapy and athletic training are constantly seeking to identify clinical teaching strategies and clinical instructor behaviors that enhance clinical education experiences (Cavanagh, Hogan & Ramgopal, 1995; Curtis, Helion, & Doomsohn, 1998; Davis, Dearman, Schwab & Kitchens, 1992; Emery, 1984; Flager, Loper-Powers, & Spitzer, 1988; Harrelson, Leaver-Dunn, & Wright, 1998; Jarksi, Kulig, & Olsen, 1990; Kaufman, Portney & Jette, 1997; Laschinger & Boss, 1989; Mangus, 1998; Weidner & August, 1997; Weidner et al., 1997). Because the role of the clinical instructor is to facilitate student synthesis of educational competencies into desired clinical outcomes (Starkey et al., 2001; O'Conner, 2001), having both content knowledge and pedagogical knowledge is seen as vital for delivering quality clinical instruction (Fothergill-Bourbonnais &

Higuchi, 1995; Irby, 1994; Lauber, 2002). In athletic training professional education programs, only limited exposure to pedagogical theory is included (NATA, 2003b).

Questioning is an important pedagogical strategy that supports student learning by targeting differing levels of information processing (Bloom, 1956; Clegg, 1967; Cunningham, 1987). By changing the level and type of questions posed, student response can range from factual recall of information to comprehension and application of information and finally, to the examination, analysis and evaluation of information through complex higher-ordered cognitive and affective processing skills (Clegg, 1987; Cunningham, 1987; Teloh, 1986; Walker, 2003). Since the primary goal of field experiences in medical, nursing, and allied health education programs is the integration and synthesis of theoretical frameworks with application of skills and knowledge in work-like settings, clinical instructors need to challenge the student by consistently moving the student toward the upper end of the cognitive processing continuum (Benner & Wrubel, 1982; Boney & Baker, 1997; Irby, 1994; Stafford, 1986; Starkey et al., 2001). Clinical instructors need to ask questions that target higher-level thinking processes.

Clinical instructors in nursing appear to ask questions that target mainly low-level cognitive processes during the post-clinical conference (Craig & Page, 1981; Phillips & Duke, 2001; Sellappah, Hussey, Blackmore & McMurry, 1998; Wink, 1993). However, post-clinical debriefs occur outside of the actual clinical experience. No research was found that examined clinical instructor questioning skills during the actual clinical experience.

Purpose of Study

The purpose of this is to gain an understanding of how clinical instructors in athletic training facilitate student learning during clinical experiences. This study will focus on the questioning skills of clinical instructor as a teaching strategy for facilitating the transfer of information from theory to application to clinical proficiency.

Research Questions

The following research questions were examined within the context of this study:

1. How do clinical instructors in athletic training utilize questioning during field experiences to assist students in acquiring, retaining and utilizing athletic training skills and knowledge?

2. Are the questioning techniques used by clinical instructors appropriate given the knowledge base and prior experiences of athletic training students?

3. Are the questions asked by clinical instructors during clinical field experiences facilitating student progression through the cognitive processing continuum?

Significance of the Study

Field experiences provide opportunity for students to synthesize information gained through didactic and laboratory experiences for application in dynamic and contextually rich work like settings (Mensch & Ennis, 2002; NATA, 1999; Starkey et al., 2001). For the student to transition from theoretical knowledge toward skilled clinical knowledge (Benner & Wrubel, 1982) both experience and critical analysis skills are needed (Behar-Horenstein, Dolan, Courts, & Mitchell, 2000; Facione, Facione, & Sanchez, 1994; Leaver-Dunn, Harrelson, Martin, & Wyatt; 2002). King (1995) advocates using questioning to promote and enhance the development of critical thinking, and House, Chassie and Spohn (1990) see questioning as "an essential ingredient in effective teaching" (p. 196). Questioning is the purposeful use of questions as an instructional strategy to engage learners in the learning

process with the goal of prompting critical thinking and application of knowledge (Wilen, 1986).

Thought provoking questions can be used to guide or train students to think critically (King, 1995). Asking questions that require students to analyze situations during field experiences is important for building relationships between conceptual knowledge and application knowledge (Dreyfus & Dreyfus, 1996; Phillips & Duke, 2001) and to move the student toward clinical proficiency (Harrelson, 2003; Harrelson & Leaver-Dunn, 2002). Researchers in nursing have studied the use of questioning by clinical instructors from several different perspectives.

Studies conducted by Graig and Page (1981) and by Wink (1993) examined the effectiveness of instructional strategies designed to improve the cognition level of questions asked by clinical instructors during the post clinical conference. Sellappah et al (1998) examined the relationship between academic qualification, years of clinical experience, and years of clinical teaching experience and the cognition level of questions posed during post clinical conferences. Rossignol (1997) explored the relationship between selected discourse strategies utilized during post clinical conferences, two

of which involved questioning, and critical thinking abilities of nursing students. And Phillips and Duke (2001) utilized a different approach to examine the cognition levels of questions asked by clinical instructors that did not involve post-clinical conference. The researchers utilized a qualitative research design to "explore, describe and compare levels of questions" (p 524). No research was found in the nursing literature that examined the use of clinical instructor questioning during the actual field experience. Nor has research been found on the questioning skills of clinical instructors in athletic training. Gaining a better understanding of how clinical instructors facilitate student learning and use questioning during clinical field experiences will provide a richer and more accurate representation of the questioning skills of clinical instructors.

Assumptions

The researcher acknowledges that the following assumptions were inherent within this study:

1. The researcher was competent in qualitative data collection.

2. The researcher had an in-depth knowledge of the athletic training education program curricular content and

course progression at the institution where the study took place.

3. The researcher was able to determine if questions asked by clinical instructors were appropriate for a student's knowledge level and past clinical assignments. A potential positive implication of this assumption was that the researcher would have an awareness of whether the content being discussed represents new or repeated exposure to the content. A potential negative implication of this assumption was that the researcher may have had set expectations on how students at certain levels should be challenged.

4. Clinical instructors will utilize questions as part of their teaching strategy during clinical field experiences.

5. Clinical instructors will not alter their normal clinical instruction behaviors during data collection. However, some alteration may occur as a result of being observed.

Limitations

The following limitations were considered when analyzing and describing the data and interpreting the results of this study:

1. The qualitative research design selected for this study required the researcher to be the primary instrument for data collection and analysis; personal bias and human error was possible.

2. Data was collected in a working athletic training facility where athletic health care was being provided to athletes who had sustained injury or illness. Because clinical instructors were responsible for the well being of the athlete as well as the educational experience of the student, situations may have arisen during data collection when the clinical instructor may have needed to cease clinical instruction in order to respond to an emergency situation.

3. Clinical instructors may have altered their normal clinical instruction behaviors during data collection as a result of the possibility of being observed.

4. Clinical instructors may have altered their clinical instructional strategies based on realizations made while listening to their recorded interactions with athletic training students during the stimulated recall interview of prior field observations.

Definition of Terms

The following definitions were used within the contexts of this study:

Athletic Training Student (ATS)

Athletic training student was defined as a student who is enrolled in an accredited entry-level athletic training education program (NATA, 2003a). The program in which these students were enrolled is unique in that the program has maintained consistent accreditation status since 1974 with only two changes in program leadership; is one of the largest programs in New England and has an overall success rate of 90% on passing the national certification examination.

Approved Clinical Instructor (ACI)

The National Athletic Trainers' Association Education Council, (NATA, 2003a) defined ACI as a Certified Athletic Trainer (ATC) who has completed an approved clinical instructor workshop and who has one year of experience working as an ATC.

Clinical Instructor (CI)

A clinical instructor was defined as an allied health care professional that supervises and instructs students during direct patient care experiences in the clinical education component of the educational program. In Athletic Training Education Programs (ATEP), the clinical instructor must be a Board Certified Athletic Trainer and have one

year of experience prior to becoming a clinical instructor (NATA, 2003a).

Cognitive Processing

Cognitive processing was defined as engaging information in the sensory, working and long term memory stores through the functions of doing, perceiving and reflecting to access thinking for memory, thinking for discovery or thinking for creativity (Bruner, 1967; Cowan, 1984; Dewey, 1938; Mosston & Ashworth, 2002; Lewin, 1948).

Cognition Level

A hierarchical continuum of cognitive processing abilities: knowledge, comprehension, application, analysis, synthesis and evaluation (Bloom, 1956).

Direct Supervision

The National Athletic Trainers Association (NATA)(2003a) defined direct supervision as auditory and visual interaction between the athletic training student and an ATC.

Experiential Learning

Experiential learning occurs when experiences give rise to meaningful and useful information through the internalization of insights gained through examining the relationship between theory and practice, thought and action and is built upon past experiences and knowledge to

create new knowledge for use in future experiences (Beard & Wilson, 2002; Dewey, 1938; Kolb, 1984).

Facilitation

Techniques used by the clinical instructor to enhance the learning experience of students involved in clinical field experiences and to support the transfer of learning between the didactic and field experience (Priest & Gass, 1997).

Field Experience

Field experience was defined as the portion of clinical education where students are provided the opportunity to apply professional skills and knowledge in a workplace environment under the supervision of a clinical instructor (Ford, 1978; NATA, 2003a).

Questioning

Questioning was defined as the purposeful use of questions as an instructional strategy to engage learners in the learning process with the goal of prompting critical thinking and application of knowledge (Wilen, 1986).

Questioning Skills

Orlich, Harder, & Callahan, et al (1990) defined questioning skills as the way questions are phrased, timed, sequenced and delivered in order to stimulate multiple levels of cognitive processing and enhance learning.

Overview

A case study research design was used to examine the questioning skills of Approved Clinical Instructors (ACIs) with Athletic Training Students (ATS) during field experiences. Participants were eight ACIs and 24 ATS affiliated with an athletic training education program (ATEP) located in New England.

Access to the data collection site was obtained from the Program Director and the Coordinator of Athletic Training Services employed by the institution where data collection occurred. Prior to data collection, the general purpose and data collection procedures was explained to all potential participants and to the ATS supervised by potential participants. Informed consents were reviewed, signed and obtained by all potential participants and by the ATS supervised by potential participants prior to data collection.

Data was collected through semi-structured initial interviews, field observations, audio recording, stimulated recall interviews, and question classification framework (Barnum, Guyer, & Noun, 2002; Guyer, 2003; Merriam, 1998; Rossman & Rallis, 1998). Initial interviews were conducted only with ACIs. Stimulated recall interviews were conducted

with each ACI and with the ATS supervised by the ACI during data collection.

Field observations were recorded using an ACI-Field Observation tool during three separate 30-minute observation periods. A Questions Classification Framework designed by Sellappah, Hussey, Blackmore and McMurray (1998) was used to classify cognitive processing levels of questions asked during the data collection period.

Data collected through initial interviews, field observations, audio recording, and stimulated recall interviews were transcribed into text. Analysis occurred through microscopic, open, and axial coding and coding for process (Merriam, 1998; Pitney & Parker, 2002; Rossman & Rallis, 1998; Strauss & Corbin, 1988).

To eliminate potential bias and increase trustworthiness of the study, the following steps were implemented: (1) after each round of field observations, the primary researcher debriefed the findings with a critical friend (Guyer, 2003), (2) the critical friend recoded 25% of the questions to establish instrument reliability, (3) member checking occurred during stimulated recall interviews to verify interpretation of the data (Merriam, 1998) and (4) triangulation of data occurred among data collected from initial interviews, stimulated

recall interviews, field observations and the question classification framework to confirm the emerging findings (Guyer, 2003).

Information presented within the remainder of this proposal is organized into two chapters: review of literature and methodology. Within the review of literature, information obtained from experiential learning and critical thinking literature was included within a discussion on how information is acquired, retained and utilized. Information gathered from pedagogical theories, questioning and clinical education formed the basis for a discussion on the role of questioning during clinical instruction. In the final chapter, methodology, the conceptual framework is presented. A full description of the research question and design, gaining entrance and consent, participants, data collection procedures, measurement, analysis and limitations is presented.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

The broad question examined within this study was the role of the clinical instructor in assisting students to acquire, retain and utilize professional skills and knowledge during field experiences. Specifically, (a) do clinical instructors in athletic training utilize planned and strategic questioning to assist students in acquiring, retaining and utilizing athletic training skills and knowledge; (b) is the questioning technique appropriate for the knowledge base and prior experiences of the athletic training student; and (c) what level of cognitive processing do the questions access? While studies have been conducted to examine the questioning skills of clinical nursing instructors during post clinical conferences (Craig & Page, 1981; Phillips & Duke, 2001; Sellappah, Hussey, Blackmore & McMurry, 1998; Wink, 1993), none of the studies were conducted during the clinical experience. In athletic training, no studies have been published that examined the questioning skills of clinical instructors in athletic training. A gap remains between the use of questioning in post clinical conferences and the use of questioning during actual clinical experiences.

Information presented within the review builds a conceptual framework drawn from cognitive and developmental psychology, experiential learning, critical thinking, questioning, adult learning, nursing, athletic training and physical education literature. The information is presented in the following sections: (a) acquiring, retaining and utilizing information, (b) questioning, and (c) field experiences.

Review Of Literature

Acquiring, Retaining and Utilizing Information

Information processing

The basis for understanding the role of questioning to enhance understanding is found in the cognitive and developmental psychology literature on how information is processed (Neisser, 1967; Johnson, 1998).

Information enters the system as physically intact visual, tactile, or auditory signals that are held momentarily in sensory memory stores (Neisser, 1967). From the sensory store, the information is then transferred to the short-term memory (Cowan, 1984). Information that is not attended to and not transferred to long-term memory through utilization in the working memory begins to decay and is lost (Neisser, 1967). Long-term memory serves as the

storage site, whereas the working memory is the thinking site (Clark & Harrelson, 2002; Funder, 2001).

The conscious processing of information occurs in the working or short-term memory (Clark & Harrelson, 2002; Funder, 2001; Wolfe, 2001). The working memory permits integration of current perceptual information with stored knowledge to form intact concepts, a process that Clark and Harrelson (2002) defined as learning and thinking. When clinical instructors use strategic questioning, the student is stimulated to actively pull information from the long-term memory stores and manipulate that information within the working memory (Elder & Paul, 2003). Mosston and Ashworth (2002) divided the learning/thinking process into three: memory, discovery, and creativity.

The memory process involves retrieval of information from the long-term memory for rehearsal in the working memory (Mosston & Ashworth, 2002; Sprenger, 1999; Wolf, 2001) and is the recall and recitation of declarative knowledge or facts (Norman, 1969; Mosston & Ashworth, 2002; Sprenger, 1999; Wolf, 2001). Questions that require the student to identify anatomical structures, for example, target memory processes (Craig & Page, 1981; Gall, 1987; O'Conner, 2001).

The discovery process involves active learning and the recognition of knowledge previously unknown to the learner (Mosston & Ashworth, 2002). Learners begin to make connections between previously stored knowledge and newly acquired knowledge, gaining the ability to use abstract concepts to comprehend and understand current context (Mosston & Ashworth, 2002; Orlich, Harder, & Callahan et al., 1990). Questions that require the student to apply a known protocol in a new context target discovery-thinking processes (Benner, 1984; Craig & Page, 1981; Mosston & Ashworth, 2002).

Thinking that elicits novel responses demonstrates creative thinking (Mosston & Ashworth, 2002). To activate creative thinking processes, Orlich et al. (1990) recommended using questions that target analysis of a given situation, synthesis of concepts or evaluation of content.

In field experiences of nursing students, Benner (1984) suggested that novice student nurses rely heavily on memory thinking processes to access declarative knowledge. As such, the decision-making skills and skill application abilities of novice learners tend to be limited and rigid (Dreyfus & Dreyfus, 1996). Because the novice has no prior experience, they must fall back on guidelines to govern their actions (Benner, Tanner, & Chelsa, 1996). While

declarative knowledge relates to knowing what, gaining procedural knowledge provides the novice with knowing how (Rose, 1997; Sprenger, 1999).

Procedural knowledge is the ability to store automatic processes for routine action (Sprenger, 1999). The action is primed or influenced by a past experience yet without an awareness of consciously remembering the previous experience (Benner, 1984). Context is needed to move the novice learner beyond knowing what and how, and acquiring the basis of understanding when, why and why not (Benner & Wrubel, 1984). Increased exposure and experience within a given context will enhance procedural knowledge, allowing the learner to develop a more complex and intuitive schema for meeting the challenges within the given setting (Benner & Wrubel, 1984; Belenky, Clinchy, Goldberger, & Tarule, 1986; Guyer, 2003; Dreyfus & Dreyfus, 1996). The ability to make context-dependent judgments can only be acquired through exposure to a variety of real-life situations in which the theories and conceptual frameworks acquired in the classroom are challenged, implemented and evaluated (Belenky et al., 1986; Benner, 1984; Dreyfus, 1982). Bruner (1967) described the process of challenging, implementing and evaluating content as perceiving, doing and reflecting.

Humans develop three main systems for processing information through the memory stores (Bruner, 1967). For students in medicine, nursing and athletic training, strategies associated with classroom teaching provide opportunity for students to learn by perceiving content. Hands on laboratory sessions provide opportunity to learn by doing in contextually neutral situations. The clinical field experiences provide the opportunity for students to learn by doing in contextually rich environments and to continually reflect on prior knowledge, within new contexts, to gain greater meaning and understanding of the information (Belenky et al., 1986; Benner & Wrubel, 1984; Bruner, 1967; Guyer, 2003).

Instructional strategies that support the thinking processes of memory, discovery and creativity as described by Mosston and Ashworth (2002) through doing, perceiving and reflecting promote and enhance thinking and learning within the working memory (Bruner, 1967; Clark & Harrelson, 2002; Dewey, 1938; Funder, 2001; Lewin, 1955; Wolfe, 2001). In experiential learning, consideration is given to the role that experience, action, thought and reflection has on learning (Bruner, 1967; Dewey, 1938; Kolb, 1984; Lewin, 1955; Mitchell & Poutiatine, 2001). The clinical setting

provides the student with a contextually rich experiential learning environment.

Experiential Learning

Three basic assumptions form the foundation for experiential learning: 1) learning is best conceived as a process and not an outcome, 2) experiences engage the learner to test previously held conceptual frameworks or construct new frameworks to understand the experience, and 3) purposeful action or learning occurs when knowledge is transformed by experience and the impulse to react or act is postponed until reflection has taken place (Dewey, 1938; Kolb, 1984; Smith & Kolb, 1996). The experiential learning cycle represents stages of learning.

The learning cycle is a four-stage process, encompassing four adaptive learning modes: concrete experiences (doing/noticing), reflective observations (interpreting/reflecting), abstract conceptualizations (generalizing/judging), and active-experimentation (applying/testing) (Smith & Kolb, 1996). Kolb (1984) suggested that learning is a process that requires the resolution of conflict between two opposing modes of adapting to the external learning environment.

Concrete experiences and abstract conceptualization represent opposing methods of grasping experiences (Kolb,

1984). In concrete experiences, such as laboratory or clinical coursework, the learner relies on the tangible qualities of the immediate experience (Kolb, 1984). In abstract conceptualization, as experienced through reading textbooks for example, the learner relies on conceptual interpretation and symbolism (Kolb, 1984).

Active experimentation and reflective observations represent two opposing methods of transforming the experience into meaningful information (Kolb, 1984). Active experimentation occurs through the act of manipulating tangible objects in the external world, a process referred to as extension. In reflected observation, there is an internal reflection on what is known about the experience or what is gained through the experience and is referred to as intention (Kolb, 1984). Intention is the internal reflection of the experience or thinking while extension is the application of those thoughts (Kolb, 1984).

The experiential learning cycle represents learning as a continuous process that is grounded in experience (Kolb, 1984). Learning begins with a concrete experience. The learner then reflects upon that experience (Kolb, 1984). Drawing from personal observations and feelings about the experience as well from theoretical models, the learner is able to develop new thoughts and implications in the

abstract conceptualization mode (Smith & Kolb, 1996). The learner then attempts to test out the new knowledge in the active-experimentation phase of the learning cycle, which gives rise to new concrete experiences (Kolb, 1984; Lewin, 1955). More recently, Perciful and Nester (1996) outlined a four-staged process of learning set within a nursing education context that resembled the four-staged process associated with experiential education.

In stage one of learning, Perciful and Nester (1996) stated that the nursing student attempts to relate new information that is perceived as "potentially meaningful" with information previously acquired and stored as meaningful. Theory informs the interaction in stage one as the learner attempts to discover the "interactional meaning" between old and new information (Perciful & Nester, 1996). Stage one corresponds with the abstract-conceptualization phase of the experiential learning cycle (Kolb, 1984).

In stage two of learning, clinical experimentation forms the basis for evaluating the meaningfulness of events as the nursing student attempts to apply the newly acquired information (Perciful & Nester, 1996). Clinical experimentation as described by Perciful and Nester (1996)

strongly resembles the active-experimentation stage described by Kolb (1984).

As the student nurse becomes more proficient with application knowledge stage two blends into stage three of learning (Perciful & Nester, 1996). The learner consistently integrates new information and skills throughout the clinical experience (Perciful & Nester, 1996). Involvement in clinical fieldwork provides the concrete experience described by Kolb (1984).

The learner enters the fourth stage of learning when the learner is able to transfer the new information, which by then becomes previous knowledge, into new settings and situations (Perciful & Nester, 1996). The student utilizes critical thinking skills to reflect on the concrete experiences encountered in the clinical setting and determines the appropriateness of applying specific skills based on the specifics of the situation (Perciful & Nester, 1996). Knowledge is transformed through experience (Kolb, 1984). With reflection upon that experience, learning occurs (Dewey, 1938). As with Kolb's (1984) experiential learning cycle, the four-staged learning process described by Perciful and Nester (1996) for nursing education is continuous.

Much of the research relating experiential learning and athletic training education has centered on student and/or instructor learning-styles using Kolb's (1984) Learning Style Inventory. For example, Hansen (2001) examined the preferred learning style of clinical instructors and that of athletic training students as related to perceived helpfulness of clinical instructor behaviors. Knight, Meeuwsen, & Stemmans et al (2003) sought to determine if the learning styles of athletic training students varied when in the didactic setting versus in the clinical setting. However, Stradley, Buckley, and Kaminski et al (2002) did make reference to the experiential learning cycle when seeking to identify the preferred learning style of undergraduate athletic training students.

The findings presented by Stradley et al (2002) support Kolb's assertion that learners gain the greatest benefit when they are able to use the four different learning styles to progress through the four stages of the learning cycle. Because this cycle is repeated throughout their career, the clinical instructor should guide the learner through the four stages of the experiential learning cycle to help the learner develop experience and skills within each of the four learning styles (Kolb, 1984;

Stradley et al., 2002).

In field experiences, experiential learning takes place in dynamic, complex and work-like settings. However, the quality, complexity, and depth at which the experiences are cognitively processed cannot be guaranteed just because a student participants in the experience (Dewey, 1938; Wiedner, Trethwey, & August, 1997). Through each stage of the experiential cycle, the instructor needs to act as a guide, providing support, direction, challenges, and feedback as needed to move the student through the cycle (Mitchell & Poutiatine, 2001; Wiedner et al., 1997). Utilizing facilitation strategies that move the learner through the learning cycle promotes retrieval of information from long-term memory stores, and retention of information through processing in the working memory and the application of knowledge (Smith & Kolb, 1996).

Facilitating experiential learning

Brockhaus, Woods, and Brockhaus (1981) posited that while the task of learning belongs to the student, the educator holds the responsibility of "focusing the discussion on both the content and process" of the experience (pg 32). During the post clinical conference used in nursing education programs, the clinical instructor uses different questioning strategies to assist the student

in reflecting and analyzing thoughts, feelings, actions and statements made or encountered during a given experience (Brockhaus et al., 1981; Davies, 1995; Joplin, 1995; Letizia, 1998; O'Conner, 2001). The instructor engages the student in a discussion about the experience to help the student clarify, identify and evaluate what was learned (O'Conner, 2001). The debriefing guides reflection and allows the student to critically think about the experience (Joplin, 1995).

Through the use of verbal facilitation techniques, the skilled instructor guides the learner through the reflective process and enhances thinking processes (Mosston & Ashworth, 2002; Priest & Gass, 1997). The facilitation technique known as funneling moves the learner from concrete experience to meaningful reflection (Priest & Gass, 1997).

The clinical instructor using the funneling process will sequence questions that first seek to stimulate the thinking process of memory, then of discovery, and finally of creativity (Borton, 1970; Mosston & Ashworth, 2002). Either during or immediately after a specific event during the field experience, questions are posed that cause the learner to recall specific facts (Gass, 1990). For example, asking the student the name of a muscle, recite specific

protocols related to the given event or identify the theoretic principle behind the action taken stimulates the thinking process of memory (Borton, 1970; Mosston & Ashworth, 2002; Priest & Gass, 1997).

The second level of questioning seek to elicit thoughts on how events within the experience impacted decision-making, affected outcomes, and compared to previously held perceptions (Priest & Gass, 1997). Priest and Gass (1997) term this phase as helping the participant to identify relevancy. The questioning strategy at this point is to help the learner connect previously held knowledge with the realities of the current context; to identify the most relevant aspects of the event and to discover the "interactional meaning" between old and new information (Perciful & Nester, 1996; Priest & Gass, 1997). The learner should then be asked to summarize information, review findings and draw conclusions (Project Adventure, 1989). Questions asked during the second level correspond with the thinking process described by Mosston and Ashworth (2002) as discovery.

The third level of questions posed when using the funneling facilitation technique are considered application questions and attempt to help the leaner transfer the knowledge gained from the current experience with past and

future experiences (Priest & Gass, 1997). The learner is asked questions that promote strategic planning for utilizing information in varied experiences (Priest & Gass, 1997). Questions that promote deeper analysis of information and that require the learner to synthesize, apply and evaluate content (Project Adventure, 1989) correspond with stimulating the thinking process described by Mosston and Ashworth (2002) as creative. Clinical instructors also need to be concerned with focusing student attention toward the development of critical thinking skills, the cognitive aspect of information processing (Baker, 1996; Colucciello, 1999; Davies, 1999; Heinrichs, 2002; Leaver-Dunn et al., 2002).

Critical Thinking

The development of critical thinking skills has become a major focus in many professional educational programs (Fuller, 1997). Critical thinking involves evaluating presented information to test or challenge the claims or concepts within the information. The critical thinker may compare the new theory to similar theories he/she already accepts to be true (Fuller, 1997). As an instructional strategy, promoting the use of critical thinking provides opportunity for students to process information multiple times and supports the retrieval of information from long-

term memory stores and rehearsal of information while in the working memory (Clark & Harrelson, 2002).

Critical thinking is also thought to be important in the development of clinical reasoning skills (Tichenor et al., 1995). More experienced learners appear to utilize different techniques to collect and interpret new information than do their entry-level or novice counterparts (Benner, 1984; Guyer, 2003; Tichenor et al., 1995). Teaching models that facilitate critical thinking appear to be widely utilized in medical, nursing and allied health professional preparation programs (Fuller, 1997; Hay, 1995; Kaufman, Portney, & Jette, 1997; Soloman, Binkley, & Stratford, 1996).

Through a comprehensive Delphi study involving 46 researchers representing a variety of academic disciplines across North America, Facione (1990) identified six cognitive skills associated with critical thinking. Cognitive abilities of analysis, evaluation, inference, interpretation, explanation and self-examination were needed to critically examine and process information (Facione, 1990).

In order to utilize the cognitive skills associated with critical thinking, the learner also needs to possess a "critical spirit" (p. 245) that motivates the learner to

develop critical thinking abilities (Facione, Facione, & Sanchez, 1994). While the critical thinking subscales associated with a critical spirit were professionally non-specific, Facione et al. (1994) provided an interpretation and application of the subscales for the nursing education context. Learners who were curious, systematic, analytical, open-minded, self-confident, and mature appeared to be better able to develop critical thinking skills (Facione et al., 1994). Additionally, the desire to seek the truth contributed to the development of critical thinking (Facion et al., 1994).

Utilizing critical thinking as a learning strategy is geared to an end goal of understanding and comprehension for long-term retention of information (Fuller, 1997). Walker (2003) supported the need for educators in athletic training to be concerned with including learning strategies to promote critical thinking among athletic training students. Nearly every action taken by a Certified Athletic Trainer involves critical thinking (Walker, 2003). Yet, when Leaver-Dunn et al. (2002) examined critical thinking disposition among athletic training students, the researchers found a weak tendency toward critical thinking. Both Walker (2003) and Leaver-Dunn et al. (2002) point out that athletic training students can not develop innate

disposition toward critical thinking if critical thinking is not fostered within their educational experiences. Walker (2003) advocated an integrated approach for fostering critical thinking that encompasses all aspects of the athletic training education curriculum. Of the three strategies suggested, questioning seems appropriate for use in the clinical field setting.

Questioning

Learning is a cycle, driven by asking questions about content, source, associated tasks, problems, quality, interpretation, and implications of the information presented (Elder & Paul, 2003; Kolb, 1984). The conscious flow of thinking requires a stimulus, cognitive dissonance, mediation and a response (Mosston & Ashworth, 2002). Questioning has consistently and extensively been in use as a teaching strategy since Socrates (Clegg, 1987; Clegg, 1967; Teloh, 1986). The Socratic method involves engaging the learner to disclose and support their beliefs, opinions and ideas through a series of questions and counter-questions (Teloh, 1986). The dialogue is an exchange of questions and statements leading to additional questioning, contemplation, examination and discussion (Clegg, 1987). The Socratic method involves more than questioning for factual recall of information; the questions stimulate the

learner to examine, analyze and evaluate the information through complex higher-ordered cognitive and affective processing skills (Bloom, 1956; Clegg, 1987; Cunningham, 1987; Teloh, 1986; Walker, 2003).

Questioning continues to be a core teaching strategy (Dillon, 1990), yet the majority of questions posed in elementary and secondary classrooms are not often phrased to activate higher-level cognitive processing abilities that are the hallmark of the Socratic method (Clegg, 1967; Cunningham, 1987; Dillon, 1990; Gall, 1987; Teloh, 1986; Wilen, 1987). In the college-aged student, where the Socratic method is thought to be more effective (Gall, 1987; Knowles, 1970), lower-cognitive questions are still asked more frequently than higher-level questions (Gall, 1987).

Many researchers believe that asking questions enhances teaching effectiveness and student learning (Clegg, 1986; Dillon, 1990; Gall, 1987; Phillips & Duke, 2001; Wilen, 1986). Questions are used to evaluate knowledge and comprehension level (Wilen, 1986). Effective questioning should move the learner through the experience and toward the intended objective of learning (Wilen, 1986). Questions are central to effectively facilitating experiential learning (Borton, 1970; Perciful & Nester,

1996; Priest & Gass, 1997; Project Adventure, 1989) and stimulating critical thinking (Baker, 1996; Colucciello, 1999; Davies, 1999; Heinrichs, 2002; Leaver-Dunn et al., 2002).

Effective questioning occurs through thoughtful planning (Wilen, 1986). Without a clearly conceptualized questioning strategy, the questions may or may not: (a) connect to the overall learning objectives, (b) enhance and deepen the learners' understanding of content, and (c) be an effective teaching strategy (Wilen, 1986). Questioning techniques are simply the way questions are asked: phrasing, timing, sequencing and delivery.

Questioning techniques

Phrasing and Bloom's Taxonomy

Questions need to be clearly phrased to avoid ambiguity of response, prevent emphasis being placed on non-pertinent information, target specific cognitive processing skills and decrease the chance of response by guess (Dillon, 1990; Wilen, 1987). Blooms Taxonomy (Bloom, 1956) provides teachers with terminology that allows questions to be phrased to target specific cognitive processing along six increasingly complex levels (Clegg, 1967; Cunningham, 1987; Hunkins, 1987; Orlich et al., 1990). Bloom's classification system presents a

hierarchical continuum of cognitive processing abilities: knowledge, comprehension, application, analysis synthesis and evaluation (Bloom, 1956). Knowledge is seen as the simplest cognitive processing behavior, while evaluation is considered the most complex (Craig & Page, 1981).

Knowledge Level Questions. Phrasing questions that require students to recall, memorize, recognize, identify or define facts, bits of information, terminology, definitions, conventions, rules, or guidelines accesses knowledge level cognitive processing skills (Bloom, 1956; Orlich et al., 1990). Factual questions are used primarily for purposes of establishing knowledge base and checking superficial level of understanding (Bloom, 1956; Cunningham, 1987; Orlich et al., 1990). Recall questions serve to refresh the existence of known or similar knowledge and establishes readiness to learn (Knowles, 1970; O'Conner, 2001). Knowledge level questions target the thinking process described by Mosston and Ashworth (2002) as memory.

Comprehension Level Questions. Asking students to interpret information through how and why questions, or compare and contrast statements activates cognitive abilities associated with comprehension (Bloom, 1956; Craig & Page, 1981; Orlich et al., 1990). Questions targeting

comprehension are asked less frequently than knowledge level questions (Cunningham, 1987). Comprehension level questions target the thinking process described by Mosston and Ashworth (2002) as memory. Knowledge and comprehension level questions are posed first when used in conjunction with funneling facilitation strategies during experiential learning settings (Borton, 1970; Priest & Gass, 1997; Project Adventure, 1987).

Application Level Questions. Requiring students to use known conceptual models for solving unique or new challenges or in new settings, involves cognitive processing skills associated with application (Bloom, 1956; Orlich et al., 1990). Field experiences provide problem-centered challenges that instill a need to know concept that requires application of skill and knowledge to determine the nature of the problem under consideration (McLoda, 2003). When used in conjunction with funneling facilitation strategies during experiential learning settings, asking questions that target application processes mark the beginning of the second set of questions intended to stimulate discovery of the "interactional meaning" between old and new information (Borton, 1970; Mosston & Ashworth, 2002; Perciful & Nester, 1996; Priest & Gass, 1997; Project Adventure, 1987). Knowledge,

comprehension and application are considered lower-level cognitive processing skills (Craig & Page, 1981).

Analysis/synthesis Level Questions. Phrasing questions that require students to take apart complex information to examine meaning, structure, and function is considered a higher-level cognitive skill, called analysis (Bloom, 1956; Orlich et al., 1990). "The ability to grasp a clinical situation is dependent on the ability to single out the relevant from the irrelevant elements of the situation" (O'Conner, 2001, p 43.) Benner and Wrubel (1984) labeled this "perceptual awareness". Perceptual awareness involves the nurse "seeing" what is most salient in the situation to identify a clinical problem (Benner, 1984). Mosston and Ashworth (2002) described thinking processes that generate new information as creative. When students are asked to create new inferences or derive meaning from differing perspectives or models, the student is using synthesis-processing skills (Bloom, 1956; Orlich et al., 1990). The primary goal of field experiences in professional education programs is the integration and synthesis of conceptual frameworks with application of skills and knowledge in work-like settings in order to develop professional proficiency (Benner et al., 1996; O'Conner,

2001; Starkey, Koehneke, Sedory, & Turocy, 2001; Weidner & Henning, 2002).

Evaluative Level Questions. Ability to process information at the evaluative level requires the highest level processing skills and demands the student to make judgments, state values, and provide opinions (Bloom, 1956; Orlich et al., 1990). The last three, analysis, synthesis and evaluation are considered high level cognitive processing abilities (Craig & Page, 1981) and correspond with the third level of questions that should be asked by clinical instructors using the funneling facilitation technique to guide students through clinical experiences (Borton, 1970; Priest & Gass, 1997; Project Adventure, 1987).

Sequencing and Delivery of Questions

To be most effective, when should questions be asked? Gall (1987) indicated that questions should be utilized before, during and after the presentation of new content. Within each phase, however, the function of questioning changes and therefore the type of question asked should also change.

Questions asked prior to introducing new content alerts the learner that new information is forthcoming and allows the learner to organize thought processes in

anticipation of the new incoming content (Cunningham, 1987; Gall, 1987; Joplin, 1995). The focus of pre-event questioning should be to stimulate thought on what the student already knows about the upcoming information (Gall, 1987). Pre-event questioning in the clinical setting, for example, may involve asking a first rotation student to identify the sequence and components of an orthopedic assessment in preparation for evaluating an ankle (Cunningham, 1987; Craig & Page, 1981; Gall, 1987; Guyer, 2003).

Asking questions during the presentation phase of new course content is thought to be advantageous for checking student understanding as the new information is being initially processed (Gall, 1987). Also, teacher questioning during instruction directs student attention to focusing on elements of the content thought by the teacher to be most important (Gall, 1987; Wilen, 1986). Questioning after instruction allows opportunity for review, reflection and application of the information (Gall, 1987).

Questions can be asked in a sequence that moves the student from processing at the knowledge level to the higher-level processing ability of evaluation (Hunkins, 1987) as does the funneling facilitation technique described by Gass (1990). For inductive reasoning,

questions should be sequenced to move the learner from lower to higher cognitive processing. When the series of questions begin with higher-level questioning and moves to lower-level questioning, deductive reasoning is stimulated (Hunkins, 1987).

Timing and Questioning

Whether the questioning technique employed is based on the Socratic method or Blooms Taxonomy scale, a vital component of questioning is allowing time for the student to process the information and formulate a response (Gall, 1987; Rowe, 1987; Wilen, 1987). Students need between three and five seconds to fully consider the question, the information and their response (Rowe, 1987). If students are engaged in the discussion, and have an adequate content base of the concepts within the discussion, waiting five seconds increases the likelihood that the student will make a thoughtful and correct response (Rowe, 1987). Gall (1987), Rowe (1987) and Wilen (1987) suggested that allowing adequate wait time will enhance the student experience through increasing: (a) frequency of student response, (b) inference statements supported with evidence, (b) student thinking about a given topic, (d) the number of correct responses, and (e) student self-confidence.

Questioning in Clinical Field Settings

Asking questions that require students to analyze situations in the clinical setting is important to the development of planning and organization skills (Schweer, 1968; Stokes, 1998). Questions that stimulate students to answer "why" help students connect prior learning to current context, assist in the formation of patterns and relationships between conceptual knowledge and application knowledge, and foster critical thinking in the clinical setting (Dreyfus & Dreyfus, 1996; Phillips & Duke, 2001; Schweer, 1968).

Learners appear to progress through five stages of skill-acquisition in the clinical setting: novice, advanced beginner, competent, proficient and expert (Benner, 1982; 1984; Dreyfus & Dreyfus, 1996; Guyer, 2003). The type of questions utilized in field settings should be appropriate for the academic, experience and cognition level of the student being questioned (Guyer, 2003). Walker (2003) recommends utilizing the Bloom Taxonomy (1956) scale to find examples of words that allow the clinical instructor to challenge the student at different levels of cognitive processing.

Novice Learners and Questioning

Novice students with limited content and experience are often at the knowledge level of cognitive processing when beginning field experiences (Benner, 1984; Dreyfus & Dreyfus, 1996; Guyer, 2003). Clark and Harrelson (2003) refer to the knowledge level as the "remember" stage because the learner is trying to recall rather than apply or utilize content. The clinical instructor should, at first, ask questions that allow the novice student to identify key elements of the problem; describe what events or actions that occurred; and state the sequence taken in identifying the current problem (Craig & Page, 1981). Such questioning would be appropriate to use in the first phase of questions within the funneling facilitation technique (Priest & Gass, 1997). With additional experiences and an increasing content base, students enter the advanced beginner stage (Benner, 1982; Dreyfus & Dreyfus, 1996).

Advanced Beginner Learners and Questioning

Advanced beginners have experiences from which can be drawn "global characteristics" about a given situation that will assist them in developing a more complex schema for reacting in similar situations (Benner, 1984, p. 23). Adult learners bring an additional set of life experiences from which to draw and are able to incorporate outside

experiences into the learning environment (Knowles, 1970). While advanced beginners are able to utilize enhanced and complex skill sets, they are still unable to separate meaningful information from non-meaningful information in a given context (Benner, 1984; Dreyfus & Dreyfus, 1996; Guyer, 2003). Advanced beginners need assistance from the clinical instructor to avoid performing unnecessary tasks, and in more clearly identifying important nuances of situations (Benner, 1984; Guyer, 2003; O'Conner, 2001). Questions that require the learner to compare and connect content, and that clarify effect, affect, and outcomes would be an appropriate strategy to use with advanced beginner learners (Benner, et al., 1996; Priest & Gass, 1997; Guyer, 2003).

Moving from questions that seek to have the student identify what or when, the clinical instructor should ask the student to rephrase, explain, compare or conclude aspects of the experience (Benner, 1984; Craig & Page, 1981; Guyer, 2003). Guyer (2003) recommended challenging students who have larger content and experience bases at the higher cognitive processing levels. Asking the student to interpret or extrapolate the information requires a higher level of cognitive processing referred to as comprehension (Bloom, 1956; Krathwohl, Bloom, & Masia,

1984). To further challenge the learner, the clinical instructor should pose questions that require application of content to reach the "use" level of cognitive processing (Clark & Harrelson, 2003; Craig & Page, 1981).

Competent Learners and Questioning

Learners reaching the competent stage have developed more complex and efficient problem-solving models (Dreyfus & Dreyfus, 1996) based on prior experiences. The adult learner values and understands the importance of application for future needs (Knowles, 1970). Competent learners display the ability to "see his or her actions in terms of long-range plans or goals of which he or she is consciously aware" (Benner, 1984. p 25-26). At this point, the instructor needs to focus attention on improving decision making to care for multiple patients with complex needs (Benner, 1984). The learner should be challenged to analyze and synthesize content (Benner, 1984; Craig & Page, 1981; Guyer, 2003; Walker, 2003).

Questioning that promotes analysis involves asking the student to make connections among the different bits of information gathered on the current problem and comparing the information with content previously gathered in other learning experiences (Bloom, 1956). The student should be able to defend their responses, provide support for their

perspective as well as explain why some options were not selected when attempting to find a solution to the problem under consideration (Bloom, 1956; Cunningham, 1987; Craig & Page, 1981). As the learner develops the ability to analyze information, the clinical instructor can move the learner into still higher-level thinking by probing with questions that require synthesis and evaluation of information (Krawthwohl et al., 1974).

The ability to synthesize information involves seeing the connections, relationships, combinations and patterns within information pertinent to solving the problem being studied (Bloom, 1956; Craig & Page, 1981). To promote synthesis of information, the clinical instructor should ask the learner to create, suggest, develop, or formulate a plan of action or response for solving the problem (Craig & Page, 1981). The advanced level student using the highest level of cognitive processing should be able to respond to questions that require h/her to make a judgment regarding the accuracy, consistency, internal and external validity of the information gathered (Cunningham, 1987; Krathwohl et al., 1984). To promote evaluative level cognition, Craig and Page (1981) recommended asking the student to choose, decide, or defend the most appropriate action to take in response to a given set of criteria gathered on a specific

problem. The use of strategic questioning during the experiential learning component of the curriculum provides opportunity for students to connect prior learning to current context and foster critical thinking in the clinical setting (Phillips & Duke, 2001; Schweer, 1968).

Questioning Abilities of Clinical Instructors

Several researchers have conducted studies to examine the level of cognitive processing questions asked during clinical post-conference in nursing education (Craig & Page, 1981; Phillips & Duke, 2001; Sellappah, Hussey, Blackmore & McMurry, 1998; Wink, 1993). While this researcher has found no studies examining questioning skills of clinical instructors in athletic training field experiences, studies conducted by Barnum, Guyer and Noun (2002), and Guyer (2003) on the field experiences of athletic training students utilized qualitative design methods that may be useful for application in a study to examine questioning skills of clinical instructors in athletic training field experiences.

Studies conducted by Craig and Page (1981) and by Wink (1993) examined the effectiveness of instructional strategies designed to improve questioning skills of clinical instructors during post-clinical conferences with nursing students. The studies were similar in that both

used an experimental or quasi-experimental design, pre and post-test assessment, an instructional strategy designed to enhance questioning level, and classifying questions based on a framework adapted from Blooms (1956) Taxonomy for Cognitive processing (Craig & Page, 1981; Wink, 1993).

In the earlier of the two studies, Craig and Page (1981) examined the effectiveness of a 112-page self-instructional module on increasing the cognitive level of questions asked by clinical instructors. Assessment consisted of recording 28) 30-minute post-clinical conferences and coding questions for cognitive processing level. During the clinical post-conference, 457 instructor questions were recorded. Data was analyzed using a Question Classification Framework (Craig & Page, 1981) developed by the researchers, based on the works of Bloom (1956), Clegg et al. (1969), Manson and Clegg (1970), and Hunkins (1976).

The researchers conducted a training session on coding data and three raters independently coded 50 randomly selected questions. Inter-rater agreement was found to be 86.7%. One researcher coded the remaining questions.

Questions presented during the pre and posttest assessment were coded by level of cognitive processing. Lower-level questions targeted knowledge and comprehension, and higher-level questions targeted application, analysis,

synthesis and evaluation (Craig & Page, 1981). In pretest assessment, 19.70% of questions asked by all clinical instructors were considered high-level questions. In the posttest, the experimental group showed improvement in the number of higher-level questioning used in clinical post-conferences. Of the 164 questions posed, 58 or 35.3% of the questions were geared toward engaging higher level cognitive processing.

While Craig and Page (1981) were able to improve the ability of clinical nursing instructors to ask questions geared toward engaging higher level processing of information obtained during clinical post conference experiences, the researchers concluded that additional improvement was needed. Also, the inability of the control group to incorporate questioning for higher level processing was disconcerting as it possibly represented the actual state of clinical instructor questioning abilities. Information obtained from the study conducted by Craig and Page (1981) alerted nursing educators to the need for improving questioning skills and created an instrument for classifying questions that would be useful in subsequent studies (Phillips & Duke, 2001; Sellappah et al., 1998).

A later study conducted by Wink (1993) also examined strategies for improving the level of questions asked by

clinical instructors in clinical post-conferences. In this quasi-experimental design, participants were ten faculty members from institutions granting either a baccalaureate degree in nursing or an associate degree in nursing. An interesting technique used by the researcher to maintain internal validity was to title the study as Interaction Patterns in Post-clinical conferences (Wink, 1993). However, while the true intent of the study, to examine the level of questioning asked in post conference, was kept from the control group, the treatment group was aware of the research question (Wink, 1993).

Data was collected during eight post-clinical conferences: four prior training, and four-post training. Wink (1993) selected the Teacher Pupil Questioning Inventory (TPQI)(Davis & Tinsley, 1967) for coding and analyzing the cognitive processing levels of the data. The TPQI was selected based on ease of use, and the inclusion of questions addressing affective processing and classroom procedures (Wink, 1993). Intra-rater reliability for the TPQI was reported to range from .6 to 1.00 during use in previous studies (Wink, 1993). Because the definitions utilized within the TPQI were derived from Bloom's Taxonomy (1956), the instrument was also found to be valid (Wink, 1993).

Just as in the Craig and Page (1981) study, question asked on the application, analysis, synthesis and evaluative levels were classified as high cognition level questions. Within the low-level cognition questions, Wink (1993) included a level termed translation, increasing the categories within low-level questions to three: knowledge, translation and comprehension. Data was analyzed with 10-data sets being reanalyzed to establish inter-rater reliability. The Pearson r was found to be .94.

During pretest assessment, 23% of the questions asked by instructors were classified as high-level cognition questions; 77% of questions were classified as low-level cognition questions. Wink (1993) points out that within the high-level grouping, no questions were asked that targeted the cognitive ability of synthesis.

During assessment of post-test data, the treatment group asked significantly ($U = 4$, p [one-tailed] $= .012$) more high cognitive level questions than did the control group (Wink, 1993). When comparing the number of high-level questions asked with type of program participants represented, no significant difference ($U = 14$; $p = .2284$) was found. Wink (1993) concluded that the cognitive level of questions asked by instructors during clinical post-conferences could be increased through additional training

on questioning for cognition (Wink, 1993). Limitations of the study conducted by Wink (1993) included inability to generalize to the larger clinical instructor nursing population due to homogeneity of participants and use of convenience sampling, presence of Hawthorne-like Affect on performance of treatment group, and absence of synthesis questions due to strict definition of synthesis.

In a study conducted with Australian clinical instructors in nursing, Sellappah et al. (1998) also examined questioning strategies used during post-clinical conferences. Specifically, the researchers were interested in examining the relationship between academic qualifications, years of clinical experience, and years of teaching experience of the participant and questioning strategies used by the participant. Participants included 26 clinical instructors from one university.

Information was gathered on the professional qualifications, years of classroom teaching experience, clinical teaching experience, combined classroom and clinical teaching experience and clinical experiences of each participant. Each participant was audio taped during two post-clinical conferences: one during the first clinical rotation in semester four of the program, and again during the final clinical rotation in semester six.

Data was collected, transcribed into text and coded using the Question Classification Framework of Craig and Page (1981).

Two independent raters categorized a total of 993 questions. Inter-rater reliability was found to be 85.6% among 850 questions. The raters were unable to categorize 143 questions using Craig and Page's (1981) question classification framework. After review and discussion regarding the remaining 143 questions, Craig and Page's (1981) framework was adapted to include the cognitive processing level of information in the lower-levels, and an additional category for affective, Yes/No, and rhetorical/probing questions (Sellappah et al., 1998). The need to include an additional category within the low-level cognition category was consistent with the classification framework utilized by Wink (1993).

Sellappah et al (1998) also classified information, knowledge, comprehension and application as lower level cognitive processing. In previous studies conducted Craig and Page (1981) and Wink (1993) application was classified as a high cognitive level ability. Sellappah et al (1998) designated analysis, evaluation and synthesis as higher-level cognitive processing.

Sellappah et al (1998) reported that 91.2% of questions asked were classified as low cognition level questions. Questions that stimulated recall, recitation, or identification of facts constituted 51.2% of low-level cognition questions. High-level questions accounted for 4.4 % of the questions asked. The remaining 4.3% of questions fell in the "other" category, such as affective, yes/no, and rhetorical. Sellappah et al (2001) also reported that based on the results of Mann-Whitney U-test, no significant difference was found between the teaching qualifications of the instructor asking the question and the level of cognitive processing the question targeted. Spearman's rho affirmed that no significant relationship ($r = 0.18$, $P > .05$) existed between years of clinical teaching experience and amount of low level or ($r = -0.01$, $P > .05$) high level questions asked (Sellappah, et al., 2001).

Findings reported by Sellappah et al (2001) are consistent with those reported by Craig and Page (1981) and Wink (1993): overwhelmingly, the type of questions asked in clinical post conferences target lower level cognitive processes. When considering academic qualifications and teaching experience, Sellappah et al (2001) concluded clinical and classroom teaching experience did not enhance

the ability of the participant to ask high cognitive level questions. Additional training is needed for clinical instructors to utilize higher level questioning more often (Sellappah, et al., 2001).

Seeking to examine questions asked of third year Australian nursing students by clinical instructors and preceptors, Phillips and Duke (2001) utilized a different approach that did not involve post clinical conference. The researchers utilized a qualitative research design to "explore, describe and compare levels of questions" (p 524). Participants consisted of 14 clinical instructors from three different universities and 14 preceptors from two different hospitals. Participants from both groups were actively facilitating clinical experiences.

Participants were given three patient care scenarios and asked to generate a list of questions that would be appropriate to ask of a third year nursing student involved in providing care within the situations described in each scenario. The participants were then asked to review the list of questions generated for each scenario and select the three questions most important in facilitating student learning.

The participants listed a total of 606 questions, but only 585 were accepted as meeting the operational

definition of a question. Data was coded and analyzed using the Question Classification Framework of Craig and Page (1981) and further analyzed through descriptive statistics. Inter-rater reliability was found to be 94.10% after two raters independently coded 10 randomly selected questions (Phillips & Duke, 2001). Chi-square analysis was used to test for significant differences between clinical instructors responses and preceptor responses. All responses were coded by level of cognitive processing (Craig & Page, 1981). Questions were coded into the higher category if a question met the definition of two adjacent processing levels (Phillips & Duke, 2001). When coding questions identified as most important for facilitating student learning, only the highest-level question was analyzed (Phillips & Duke, 2001).

Overall, both groups were found to include more low-level cognitive processing questions (75%) than high-level cognitive processing questions (25%). Clinical instructors generated more questions (55.4%) than did preceptors (44.6%), but preceptors listed more low-level questions (87.4%) than did clinical instructors (65.1%). Phillips and Duke (2001) concluded that the majority of questions asked by clinical nursing instructors target lower level cognitive processing, with knowledge level questions asked

most frequently. Findings reported by Phillips and Duke (2001) were consistent with those reported by Craig and Page (1981) and Wink (1993). Phillips and Duke (2001) also compared participant background with question cognition level.

Clinical instructors, overall, were older and had more experience in facilitating learning experiences of nursing students than did preceptors. Of the 14 preceptors participating in this study, only 4 held advanced educational degrees, compared with 12 of the 14 clinical instructors holding advanced degrees. A Mann-Whitney U-test was performed to determine if teaching qualifications or type of teaching experience influenced the level of questions asked. No significant difference was found for either lower or higher-level questioning. Spearman's rho was used to determine if a significant relationship existed between years of experience and level of question asked. No significant relationship was found. Phillips and Duke (2001) concluded that professional qualifications, years of classroom teaching experience, clinical teaching experience, combined classroom and clinical teaching experience and clinical experiences of the participant did not make any significant difference to the level of questions asked during clinical post-conferences. The

conclusions drawn by Phillips and Duke (2001) and by Selleppah et al. (1998) were in agreement: clinical and classroom teaching experience did not enhance the ability of the participant to ask high cognitive level questions.

The studies conducted by Craig and Page (1981), Wink (1993), Sellappah et al. (1998), and Phillips and Duke (2001) examined the issue of clinical instructor questioning in settings where the nursing student was not actively engaged in a clinical experience while the questions were being posed. Studies conducted by Barnum, Guyer and Noun (2002), and Guyer (2003), on the field experiences of athletic training students utilized qualitative design methods that may be useful for application in a qualitative study to examine questioning skills of clinical instructors in athletic training field experiences.

Pitney and Parker (2002) advocated utilizing qualitative research methods to examine questions within athletic training education and practice. Unlike quantative research designs that seek to prove, correlate, measure, and statistically validate the data to support or reject a pre-conceived hypothesis, qualitative research seeks to systematically describe and interpret what is seen, heard, and felt by the participants as the experience unfolds

(Guyer, 2003; Hammell, Carpenter, & Dyck, 2000; Rossman & Rallis, 1998; Thomas & Nelson, 1996).

Barnum, Guyer and Noun (2002) examined athletic training students' application of knowledge and skills in the field setting through a qualitative research design using a grounded theory approach. Grounded theory seeks to develop theoretical models that emerge from the systematic collection and analysis of "real experiences" in hopes of "offering insight, enhancing understanding and providing meaningful guide to action" (Strauss & Corbin, 1988, p. 12). Data was collected on six participants as they performed an orthopedic assessment on a patient during field experience. Data consisted of a) field observation, b) stimulated recall, and c) medical documentation (Barnum et al., 2002). The participants were also visual recorded during the field experience. Video taped data was utilized during stimulated recall sessions and in triangulation of data with field observations and medical documentation.

During field observations, the researchers maintained a 15-foot radius from the athlete and athletic training student. A clinical instructor was present, supervising the athletic training student during the evaluation process. Observations focused on background/setting, interaction between the athlete and athletic training student,

interaction between the athlete and others within the setting, and the interaction between the athletic training student and others within the setting (Barnum et al., 2002).

During the stimulated recall, participants were interviewed immediately following the injury evaluation. A series of structured, semi-structured and prompting questions were posed to elicit information regarding the selection and application of knowledge and skills utilized during the evaluation process. Stimulated recall interviews were audio taped and later transcribed into text (Barnum et al., 2002). Medical documentation denoting assessment procedure and findings was recorded. Field observations and stimulated recalls were transcribed into text. Interviews and field observations were evaluated for common trends between participants. Data were analyzed by microscopic, open, and axial coding (Barnum et al., 2002).

The trustworthiness was established through triangulation of the data, colleague review, and peer examination. Evaluation skills demonstrated by each participant and observed during field observations were compared to laboratory and classroom evaluation techniques that were taught in the athletic training education coursework on assessment of athletic injuries. Barnum et al

(2002) concluded that to support successful progression of the athletic training student from introductory to intermediate clinical experiences in athletic injury assessment, the student requires supervision and feedback as s/he begins to apply the skills previously introduced. At this stage, the use of structured checklists gives way to an early attempt at blending skills and knowledge. The information begins to have meaning, and in having meaning, is no longer memorization and regurgitation of content, but rather moving into the utilization of critical thinking and a higher level of cognition (Barnum et al., 2002).

In a subsequent study conducted by Guyer (2003) factors that influence cognitive and problems solving skills of athletic training students during the assessment of injuries in the field setting were specifically examined. Guyer (2003) also utilized a qualitative investigation design that used a grounded theory approach. Participants included six athletic training students involved in first, second, and third year level field experiences. Data collection methods included pre and post experience open-ended interview, field observations, stimulated recall and medical documentation (Guyer, 2003).

Pre-experience interview questions allowed the participant to describe prior field experience (Guyer,

2003). Post-experience interviews allowed participants to describe the cognitive and problem-solving strategies utilized during the assessment of athletic injuries. Because data was continually being analyzed during data collection, questions asked during the post-experience interview were different than questions asked in the pre-experience interview (Guyer, 2003).

Participants were observed while evaluating two athletic injuries with each evaluation occurring between two and six weeks apart with an average of 22.3 days between each evaluation (Guyer, 2003). In addition to being observed through field observations, the participants were videotaped while performing each of the athletic injury assessments.

Videotape was utilized for stimulated recall, time analysis and peer review (Guyer, 2003). During stimulated recall, participants were asked to view the footage of the injury evaluation and describe what they were thinking or attending too during the evaluation. Stimulated recalls were audio taped, transcribed into text and analyzed (Guyer, 2003).

Data from field observations, open-ended interviews, and stimulated recall interviews were analyzed initially through microanalysis or line-by-line analysis of data

(Guyer, 2003). After initial categories were generated, open and axial coding allowed further identification of the emerging categories and relationships between categories (Guyer, 2003). A third level of analysis occurred through selective and coding for process that allows integration and refinement of the evolving actions and interactions among the categories (Guyer, 2003). Common trends, themes and categories were then identified between participants in each class and among the classes.

Guyer (2003) stated that four methods were used to establish trustworthiness. First, triangulation of data occurred among data collected from open-ended interviews, stimulated recall interviews, field observations and medical documentation to confirm the emerging findings. Second, Guyer (2003) utilized member checks throughout the data collection period to verify interpretation of the data by the researcher. Third, Guyer (2003) conducted long-term observations at the site where data was collected. Finally, Guyer (2003) utilized peer examination of the findings.

Cognitive information processing, transfer of learning and learning environment emerged as factors that influence cognitive and problem-solving abilities of athletic training students (Guyer, 2003). Guyer (2003) concluded that athletic training students in first, second, and third

level field experiences utilized different cognitive and problem-solving abilities. Abilities evolved from a technique of pure repetition to that of critically thinking (Guyer, 2003). Guyer (2003) identified that a cognitively stimulating environment and feedback are essential factors in student learning during field experiences.

Summary

Information is processed through three memory stores: (1) sensory memory, (2) short term working memory, and (3) long-term memory (Clark & Harrelson, 2002; Cowan, 1984; Funder, 2001; Johnson, 1998; Neisser, 1967). Information that is not attended to or not transferred to long-term memory through utilization in the working memory begins to decay and is lost (Cowan, 1984; Funder, 2001; Neisser, 1967). The working memory permits integration of current perceptual information with stored knowledge to form intact concepts, a process that Clark and Harrelson (2002) defined as learning and thinking. For learning to occur, information must be moved from the initial perceptual store, processed in the working memory, and stored in long-term memory (Bruner; 1967; Clark & Harrelson, 2002; Sprenger, 1999; Wolf, 2001). Instructional strategies that promote the cognitive processes of memory, discovery and creativity as described by Mosston and Ashworth (2002)

through doing, perceiving and reflecting (Bruner, 1967; Dewey, 1938; Lewin, 1955) will activate retrieval of information from the long-term memory stores (Norman, 1969; Sprenger, 1999; Wolf, 2001) to promote and enhance thinking and learning within the working memory (Clark & Harrelson, 2002; Funder, 2001; Wolfe, 2001).

Clinical field settings provide ideal experiential learning environments for students to engage in memory, discovery and creative thinking by manipulating information through doing, perceiving and reflecting (Clark & Harrelson, 2002; Dewey, 1938, Lewin, 1955; Bruner, 1967). The role of the clinical instructor within the field experience is to engage the student through four adaptive learning modes: doing and noticing through concrete experiences, interpreting and reflecting through reflected observations, generalizing and judging through abstract conceptualizations and applying and testing through active experimentation (Beard & Wilson, 2002; Kolb, 1984; Smith & Kolb, 1996).

The use of questioning is central to facilitating critical thinking in experientially based learning (Beard & Wilson, 2002; Benner, 1984; Priest & Gass, 1997; Guyer, 2003; Harrelson & Leaver-Dunn, 2002; Phillips & Duke, 2001; Project Adventure, 1989; Rowles & Brigham, 1998; Sellappah

et al., 1998; Wink, 1993). By utilizing the principles of funneling and strategic questioning, the clinical instructor stimulates critical thinking, provides opportunity for students to process information multiple times, supports the retrieval of information from long-term memory stores and the rehearsal of information while in the working memory (Priest & Gass, 1997; Guyer, 2003; Harrelson & Leaver-Dunn, 2002; Phillips & Duke, 2001).

Asking questions enhances student learning (Clegg, 1986; Dillon, 1990; Gall, 1987; Wilen, 1986; Phillips & Duke, 2001). Questions can be phrased to target specific cognitive processing along six increasingly complex levels (Bloom, 1956; Clegg, 1967; Cunningham, 1987; Hunkins, 1987; Orlich et al., 1990).

During clinical field experiences, asking the student questions that target varying complexity levels of cognitive processing assists in connecting prior learning to current context, in the formation of patterns and relationships between conceptual knowledge and application knowledge, foster critical thinking, and promote the development of clinical proficiency (Dreyfus & Dreyfus, 1996; Phillips & Duke, 2001; Schweer, 1968; Stokes, 1998).

When studying the questioning skills of clinical nursing instructors, low-level cognitive questions were

asked more frequently than high-level cognitive questions (Craig & Page, 1981; Phillips & Duke, 2001; Sellappah, et al., 1998).

Opportunity for students to synthesize the cognitive, psychomotor and affective behavioral objectives that makes up the athletic training educational competencies into clinical proficiencies (NATA, 1999, Starkey et al., 2001; Mensch & Ennis, 2002). Improving the quality of field experiences is a major concern in athletic training education (NATA, 2003). Reviewing the information presented within the following sections provides a conceptual basis for examining questioning skills of clinical instructors as strategy for enhancing the acquisition, retention and utilization abilities of athletic training students during field This researcher found no published studies that examined the questioning skills of clinical instructors in nursing during the clinical experience. No information was found on the questioning skills of clinical instructors in athletic training. A gap remains between the use of questioning during clinical debriefs and the use of questioning during actual field experiences.

CHAPTER 3

METHODOLOGY

Conceptual Framework

Within the education programs of healthcare professionals, clinical field experiences are unique learning environments that provide students with the opportunity to integrate skills and knowledge in contextually rich and demanding job-like settings. While lecture and laboratory experiences provide the theoretical basis for knowing why and how, it is through the clinical field experiences that the student develops the intuitive knowing; the ability to integrate and synthesize the information into meaningful and useful tools. Clinical experiences serve as catalyst to move student learning beyond basic memorization of facts, recollection of definitions, repetition of protocols and identification of concepts. Each interaction during the experience provides opportunity for developing the complex cognitive abilities of critical consideration and analysis. The role of the clinical instructors is to assist the student in developing advanced level thinking.

Clinical instructors should direct student attention in a way that promotes thoughtful analysis, strengthens the connection between theory and application and improves

clinical skill application. The continued consideration of content through varying levels of complex cognitive processing is thought to support and enhance student learning. Therefore, to be effective in assisting the student in becoming clinically proficient, the clinical instructor needs to possess both content and pedagogic knowledge.

Experiential learning theories suggest that involvement in an experience alone is not sufficient to propel the student along the cognitive processing continuum. Clinical instructors need to incorporate instructional strategies that move the student through the continuum by directing student attention toward actions and interactions taking place during the experience. The learner should be engaged through four adaptive learning modes: concrete experiences, reflective observations, abstract conceptualization, and active experimentation. A central strategy for stimulating the student through the learning modes and for facilitating higher-level thinking processes is through the art of questioning.

Questions can be phrased to target specific cognitive processing along increasingly complex levels, as well as to access the four adaptive learning modes associated with experientially based learning. Questions can be sequenced

in a way that either promotes convergent or divergent thinking patterns. During clinical field experiences in professional education programs, asking the student questions that target varying cognitive processing levels help students to: (a) connect prior learning to current context, (b) assist in the formation of patterns and relationships between theoretical knowledge and application knowledge, (c) foster critical thinking, and (d) promote the development of clinical proficiency.

Questioning is a dominant teaching strategy. Yet, the majority of questions posed in elementary, secondary and college level classrooms stimulate lower level thinking processes. Adult learning theories suggest that lower level processes are important for developing a solid base of information and for determining student readiness to learn. Targeting low-level thinking processes, however, does not assist the student in creating new inferences or to derive meaning from differing perspectives or models.

Since the primary goal of field experiences in medical, nursing, and allied health education programs is the integration and synthesis of theoretical frameworks with application of skills and knowledge in work-like settings, clinical instructors need to challenge the student by consistently moving the student toward the upper end of the

cognitive processing continuum. Clinical instructors need to ask questions that target higher-level thinking processes.

Clinical instructors in nursing appear to ask questions that target mainly low-level cognitive processing during the post-clinical conference debrief. However, post-clinical debriefs occur outside of the actual clinical experience. No research was found that examined clinical instructor questioning skills during the actual clinical experience.

No research has been published to date that seeks to examine the questioning skills of clinical instructors in athletic training. What is known, however, is that athletic training students require varying degrees of guidance and instruction from their clinical instructors based upon the student's level of knowledge and experience. Gaining a better understanding of how clinical instructors facilitate student learning and use questions during the clinical field experience will provide a richer and more accurate representation of clinical instructor questioning skills.

Research Question

The following research questions were examined within the context of this study:

1. How do clinical instructors in athletic training utilize questioning during field experiences to assist students in acquiring, retaining and utilizing athletic training skills and knowledge?

2. Are the questioning techniques used by clinical instructors appropriate given the knowledge base and prior experiences of athletic training students?

3. Are the questions asked by clinical instructors during clinical field experiences facilitating student progress through the cognitive processing continuum?

Research Design

Because the research design desired for this study was one that would allow the researcher to understand and describe the feelings, thoughts, and actions of clinical instructors while interacting with ATSs during clinical field experiences, a qualitative design was utilized (Thomas & Nelson, 1996; Strauss & Corbin, 1998). Qualitative research seeks to systematically describe and interpret what is seen, heard, and felt by the participants as the experience unfolds (Guyer, 2003; Hammell, Carpenter, & Dyck, 2000; Rossman & Rallis, 1998; Thomas & Nelson, 1996).

A case study design was selected to examine interactions between athletic training clinical instructors

and athletic training students. Case study is often used to examine experiences that can be seen as being bounded (Merriam, 1998) as in the case of this study, to a specific aspect of an academic major/professional preparation program at a specific institution. Case studies are also characterized as having a particularistic nature, meaning that the researcher is able to "examine a specific instance [to] illuminate a general problem" (Merriam, 1998, p. 30). Case studies are also characterized as having a descriptive nature, in that the case is "rooted in context" and "resonate with experience" (Merriam, 1998. p. 31). Case studies emerge from the systematic collection and analysis of real experiences with the intent of enhancing the "reader's understanding of the phenomenon under study" (Merriam, 1998, p. 30). Therefore, a qualitative research design using a case study approach seemed most appropriate to examine the research questions posed within this study.

Qualitative research designs require that the researcher becomes an active observer and the primary tool for both data collection and analysis (Merriam, 1998). Data collection usually requires that the researcher conduct observations and interviews within a setting where the participants are able to exhibit natural behaviors (Fraenkel & Wallen, 1990). Therefore, the qualitative

researcher not only needs to gain consent from participants to be in the study, the researcher must also gain entrance into the site where the observations and interviews are to be conducted (Merriam, 1998).

Gaining Entry and Consent

Data collection sites are selected based on several factors, such as aspects of the site or the individuals at the site that may be considered uniquely different and special or considered fairly representative (Creswell, 1998; Fraenkel & Wallen, 1990; Rossman & Rallis, 1998). The data collection site for this research project was selected because of the uniquely rich and dynamic learning environment. The institution where data was collected had held continuous approval or accreditation status for 25 years as an athletic training education program and had undergone only one change in leadership during that time. The institution was proactive in establishing a Coordinator of Clinical Education position almost 15 years before it became a requirement of accreditation. The program had an accumulated 90% success rate for graduates passing the national certification examination.

The eight clinical instructors participating in the study were diverse. The clinical instructors held faculty, graduate-teaching associate, or graduate-assistant status.

Four clinical instructors held master level degrees and four held bachelor level degrees. Two instructors were pursuing doctoral degrees while four were pursuing master level degrees. Years of experience as practicing athletic trainers range from 2 to 30 and years of experience as clinical instructors range from 1 to 25. The clinical instructors received their athletic training education from one of seven different institutions.

Prior to data collection, arrangements to gain entrance to the primary site for data collection were made with the Program Director and the Coordinator of Athletic Training Services at the facility in which the study took place (Rossman & Rallis, 1998; Quinn, 1990). The Program Director Consent to Gain Entrance form is located in Appendix A. The Coordinator of Athletic Training Services Consent to Gain Entrance Form is located in Appendix B.

All potential clinical instructor participants were invited to an informational meeting explaining the general purpose of the study and the data collection procedures. Opportunity to review and sign an informed consent statement was made during the informational meeting (Rossman & Rallis, 1998). The Approved Clinical Instructor (ACI) Informed Consent statement is located in Appendix C.

A second informational meeting was held for all potential athletic training student (ATS) participants. The general purpose of the study and the data collection procedures were explained. An informed consent statement was made available for the student to review and sign (Rossman & Rallis, 1998). The ATS Informed Consent statement is located in Appendix D.

Participants

A purposeful, non-random, small sample of ACI and ATS participants was selected to allow the researcher to gain an in-depth understanding of the questioning skills of clinical instructors within a natural setting (Merriam, 1998; Rossman & Rallis, 1998). The ACI participants within this study were eight ACIs affiliated with an accredited ATEP at a small, private New England college. To allow optimal opportunity for the researcher to complete observations of ACI behavior and interactions with students during clinical field experiences, only those ACIs who were supervising ATS within the primary athletic training facility at the time of data collection were included as potential ACI participants.

The ATS participants with this study were 24 ATS affiliated with an accredited ATEP at a small, private New England College. Only those ATS who interacted with one of

the eight ACI participants during field observations were considered as ATS participants in the current study.

Data Collection

Stauss and Corbin (1988) suggest that data collection and data analysis are continuous and on going in the grounded theory approach. Data collection methods included initial semi-structured interviews, field observations, audio recordings, and stimulated recall interviews (Guyer, 2003; Merriam, 1998).

Initial Interviews

The first method of data collection involved initial interviews with the ACIs, using a semi-structured question format. The initial interview was conducted to gather information about the ACIs' educational philosophies and approach toward clinical education. The semi-structured interview format allowed the researcher to respond to and gather information about the emerging perspectives presented by the ACI (Merriam, 1998). Initial interviews were audiotaped and transcribed into text (Barnum, Guyer, & Noun, 2002; Guyer, 2003). ACI Initial Interview questions are located in Appendix E.

Field Observations

Field observations allow the researcher to "discover complexity in social settings by being there" (p. 136) and

to gather valuable data from the actions, interactions, and non-verbal communications of the participants (Rossman & Rallis, 1998). Three sets of observations were conducted on seven of the eight ACIs. ACI Jamie was observed only twice because the team for which she was providing athletic health care ended their season sooner than expected. ACIs were observed over a 39-day period. Field observations were conducted for a 30-minute time period (Craig & Page, 1981) and all observations occurred within the primary athletic training facility during the pre/post participation activity sessions.

During field observations, the researcher was situated in full view of all participants with an unobstructed view of the observation area (Quinn, 1990). The researcher used field notes to record the physical environment of the setting and interactions between the ACI, ATS and others within the setting (Merriam, 1998). Observer comments regarding insight gained through observations were recorded alongside the field notes on the Clinical Instructor Observation Tool (CI-OT) designed and piloted by the researcher (Rossman & Rallis, 1998). The CI-OT is located in Appendix F.

Audio Recording

Interactions between ACIs and ATS were audio taped during each of the three field observations using a Shure Brothers LX1-W VHS personal remote microphone attached to the ACI. Only one ACI was recorded, but two additional ACIs were given non-active remote microphones to decrease chance that wearing the device changed the ACIs' behavior (Quinn, 1990). Signals from the remote recording device were transmitted to the field observer via a Shure Brothers L4 Diversity Wireless Receiver and recorded on a Wollensak 3M Multimedia recording system (Model #2551). Recordings were stored on Maxwell Communicator Series C90 audiocassettes. Panasonic stereo headphones were used to allow the researcher to hear ACI-ATS interactions during the observation period but prevented others in the immediate area from doing so.

Audio recordings were transcribed into text (Barnum et al., 2002; Guyer, 2003). Questions asked during the recording time were coded for cognitive processing level using the Question Classification Framework of Craig and Page (1981) and as adapted by Sellappah, Hussey, Blackmore and McMurray (1998)(Phillips & Duke, 2001; Wink, 1993). The Question Classification Framework is located in

Appendix G. Audio recordings were also used in stimulated recall interviews with ATS and ACI.

To decrease the extent to which data collection methods might have changed participant behavior, the observation and recording station was established two weeks prior to data collection (Guyer, 2003; Merriam, 1998, Quinn, 1990). During the two-week period, the researcher sat at the observation/recording station while the remote microphones were placed on different ACIs (Quinn, 1990). For purposes of ensuring proper equipment functioning, a live microphone was placed on the critical friend.

Stimulated Recall

Two sets of stimulated recall interviews were conducted after each observation: ATS and ACI. Both stimulated recall interviews were conducted within 24 hours of the field observation (Guyer, 2003). During the stimulated recall, ATS were given the opportunity to hear randomly selected portions of the audio recording involving their interactions with the ACI. A series of semi-structured and probing questions were posed to elicit information regarding the cognitive processes elicited by questions asked by the ACI (Guyer, 2003). The ATS stimulated recall questions are located in Appendix H.

During the ACI stimulated recall interviews, ACIs listened to the recording of their interactions with ATS during field observations. A series of semi-structured and probing questions were posed to elicit information regarding the questioning strategies used and cognitive processing levels targeted by the ACI during the interaction (Guyer, 2003). The ACI stimulated recall questions are located in Appendix I.

All stimulated recall interviews were audio taped and later transcribed into text for triangulation of data with initial interviews, field observations, research memos and analysis of cognitive processing levels of questions (Barnum, Guyer, & Noun, 2002; Guyer, 2003; Merriam, 1998).

Measurement

Field Observation Tool

Interactions between the ACI and ATS were recorded through the use of a Clinical Instructor Observation Tool (CI-OT) designed by the researcher for the purposes of this study. The CI-OT was reviewed by professional athletic training educators whose primary responsibilities were either coordinating clinical education experiences, directing an athletic training education program (ATEP) or who had experience with qualitative research. Five revisions were conducted.

Question Classification Framework: ACI questions posed during the data collection period were coded for cognitive processing level using the Question Classification Framework of Craig and Page (1981) as adapted by Sellappah et al (1998). Craig and Page (1981) reported an inter-rater agreement of 86.7% for their Question Classification Framework. Phillips and Duke (2001) reported an inter-rater reliability of 94.10% using Craig and Page's (1981) Question Classification Framework.

In a study conducted by Selleppah et al. (1998) two independent raters categorized a total of 993 questions using Craig and Page's (1981) Question Classification Framework. Inter-rater reliability was found to be 85.6% among 850 questions. The raters were unable to categorize 143 questions. After review and discussion regarding the remaining 143 questions, Craig and Page's (1981) framework was adapted to include the cognitive processing level of information in the lower-levels, and an additional category for affective, Yes/No, and rhetorical/probing questions (Sellappah et al., 1998).

The need to include an additional category within the lower-level cognition categories was consistent with the classification framework utilized by Wink (1993). The need to consider affective processing abilities was consist with

recommendations made by Cunningham (1987). Sellappah et al. (1998) also reclassified information, knowledge, comprehension and application as lower level cognitive processing. Sellappah et al. (1998) designated analysis, evaluation and synthesis as higher-level cognitive processing as did Phillips and Duke (1998).

The coding process for the question classification framework began after all interviews, observations and stimulated recall interviews transcriptions had occurred (Craig & Page, 1981; Philips & Duke, 2001; Sellappah et al., 1998; Wink, 1993). Questions posed by ACIs were classified by cognition level according to Sellappah, Hussey, Blackmore and McMurray's (1998) question classification framework. Information, knowledge, application and comprehension level questions were classified as low-cognition questions while analysis, synthesis and evaluation level questions were classified as high cognition level questions. Yes/No, rhetorical and prompting questions were classified as other. A training session (Appendix J) on how to use the question classification framework was held and subsequently two raters coded 25% of the data sets. Inter-rater agreement of 83.9% was found. One rater classified the questions in the remaining data sets.

Analysis

Data collection and initial analysis occurs simultaneously in qualitative research (Pitney & Parker, 2002). Because the analysis is "the interplay between the data and the researcher" (p. 13) it is important that researcher be the one who collects and transcribes the data (Strauss & Corbin, 1988). The process is extremely time consuming but vital for becoming intimate with the data. Because of the close association among the researcher, the data and data analysis, the researcher should recognize how their own beliefs, assumptions and bias may color the research project and take steps to decrease or eliminate the effect of bias within the study (Strauss & Corbin, 1988).

Trustworthiness

Rossman and Rallis (1998) describe trustworthiness as the degree to which qualitative research meets the standards of acceptable and ethical practices. To eliminate potential bias and increase trustworthiness of the study, the following steps were implemented: (1) multiple observations were conducted over time (2) implementation of the peer examination/critical friend concept (3) member checking, (4) research memo and (5) triangulation of data (Guyer, 2003; Merriam, 1998; Rossman & Rallis, 1998).

One method for increasing trustworthiness is repeated observations over time. Multiple observations allow for the emergence of consistent behaviors that might not otherwise be seen during single observations (Merriam, 1998). A second method for increasing trustworthiness is the use of a critical friend.

Merriam (1998) describes the role of the peer examiner or critical friend as one who, through each step of the research process, challenges the researcher's perspectives. The intent of the challenge is to help the researcher prevent personal bias from creeping into the research, to clarify perspective and ensure that the information is represented as fully and honestly as possible (Rossman & Rallis, 1998). Two critical friends were utilized within this study.

Both critical friends were selected because of their knowledge and expertise with clinical education and qualitative research. One clinical friend was a member of the faculty within the program being studied but was not part of the study. A second critical friend was a program director of an occupational therapy education program at another institution. The role of critical friend was to test the assumptions of the researcher regarding research questions, site selection, and data collection methods, to

discuss the perspectives of the information gathered through each set of observations, and during the coding process (Merriam, 1998).

Member checking was the third method used to enhance the trustworthiness of the study. Merriam (1998) describes member checking as sharing the initial data and interpretations with the subjects to gain additional insight. Member checking occurred after each observation, either immediately or during the stimulated recall interviews.

The fourth method used to enhance trustworthiness was the research memo or field journal. Both were used to record the researcher's thoughts, such as initial analysis or directions on analysis (Strauss & Corbin, 1998); and to record feelings, such as confusion, frustration, fear or realization (Merriam, 1998). Memos are used to help gain "analytical distance" (p. 218) and to clarify thoughts (Straus & Corbin, 1998). Research memos are thought of as "thinking notes" (p. 110) and written through out the analysis process to help the researcher reflect, refine and clarify the process (Merriam, 1998).

Triangulation of data occurred among data collected from initial interviews, stimulated recall interviews, field observations, research memos and the question

classification framework to confirm findings (Guyer, 2003). Merriam (1998) stated that using multiple data sources or multiple methods of confirming findings increases trustworthiness. Rossman and Rallis (1998) see triangulation of data as way to "strengthen the robustness of the work" (p. 45).

Coding Data

Data collected from initial interviews, field observations, and stimulated recall interviews were analyzed initially through microscopic or line-by-line analysis of data (Guyer, 2003; Merriam, 1998). After initial categories were generated, open and axial coding allowed further identification of categories and relationships between categories (Guyer, 2003; Merriam, 1998; Rossman & Rallis, 1998).

A third level of analysis occurred through selective and coding for process to discover the integration and refinement of the evolving actions and interactions among the categories (Guyer, 2003). Common trends, themes and categories were then identified among participants (Merriam, 1998; Pitney & Parker, 2002; Rossman & Rallis, 1998; Strauss & Corbin, 1988).

Question Classification Framework: Questions gathered through recording ACI and ATS interactions were classified

according to Sellappah's et al. (1998) Question Classification Framework. General descriptive statistics were used to analyze the data.

Limitations

The following limitations were considered when analyzing and describing the data and interpreting the results of this study:

1. The qualitative research design selected for this study required the researcher to be the primary instrument for data collection and analysis; personal bias and human error was possible.

2. Data was collected in a working athletic training facility where athletic health care was being provided to athletes who had sustained injury or illness. Because clinical instructors were responsible for the well being of the athlete as well as the educational experience of the student, situations might have arisen during data collection when the clinical instructor needed to cease clinical instruction in order to respond to an emergency situation.

3. Clinical instructors may have altered their normal clinical instruction behaviors during data collection due to the possibility of being observed.

4. Clinical instructors may have altered their clinical instructional strategies based on realizations made while listening to their recorded interactions with athletic training students during the stimulated recall interview of prior field observations.

Conclusion

Institutional permission to conduct this study was granted through the intuitional IRB process. Permission to gain entrance to the data collection site was obtained from the program director and coordinator of athletic training services (Rossman & Rallis, 1998). An informational meeting was held with all potential participants to discuss the general purpose and procedures of the study. Informed consent to participate documents were obtained from those voluntarily agreeing to participate in the study (Thomas & Nelson, 1996).

During the two-week period prior to conducting field observations, the observation and recording station was established and remote microphones placed on various ACIs (Guyer, 2003; Merriam, 1998; Quinn, 1990). Also, the initial semi-structured interviews were conducted with all ACIs fourteen days prior to conducting the first field observation.

Field observations and audio-recordings were conducted for 30-minutes on each of the eight participants during a 39-day period. However, Jaime was only observed twice due to the athletic season ending earlier than expected. After each observation, stimulated recall interviews were conducted with the ACI and the ATS with whom the ACI interacted during the observation period. Member checking occurred at the conclusion of each observation and during the stimulated recall interviews (Merriam, 1998). Audio-recordings of the stimulated recall interviews were transcribed into text (Guyer, 2003).

At the conclusion of the first set of eight observations, audio-recordings, and stimulated recall interviews, the researcher consulted with a critical friend to discuss the findings (Rossman & Rallis, 1998). A second and third set of field observations, audio-recordings and stimulate recall interviews were then conducted and followed the same protocols as outlined for the first set.

All interviews were transcribed into text for purposes of coding (Merriam, 1998; Rossman & Rallis, 1998). Audio-recordings of the interactions between the ACIs and ATS were also transcribed into text for coding purposes (Guyer, 2003). Training on using the Question Classification Framework of Craig and Page (1981) as adapted by Sellappah

et al (1998) was conducted (Craig & Page, 1981; Philips & Duke, 2001; Sellappah et al., 1998; Wink, 1993). The researcher and a critical friend coded six randomly selected questioning-data sets for cognitive processing to establish reliability and to enhance trustworthiness (Craig & Page, 1981; Merriam, 1998; Philips & Duke, 2001; Rossman & Rallis, 1998; Sellappah et al., 1998; Wink, 1993). Reliability was established at 83.9%. One rater coded the remaining data sets.

Data was analyzed through the use of microscopic, open, axial, selective and coding for process coding methods to discover the integration and refinement of the evolving interactions among the categories (Guyer, 2003). Common trends, categories and themes, were then identified (Merriam, 1998; Pitney & Parker, 2002; Rossman & Rallis, 1998; Strauss & Corbin, 1988). Triangulation of data occurred among data collected from initial interviews, stimulated recall interviews, field observations, research memos and the question classification framework to confirm the findings (Guyer, 2003; Merriam, 1998; Rossman & Rallis, 1998; Strauss & Corbin, 1988).

CHAPTER 4

RESULTS

Introduction

The purpose of this study was to gain an understanding of teaching strategies used by approved clinical instructors (ACIs) in athletic training to facilitate student learning during clinical experiences. The qualitative case study investigation was focused on ACIs use of questioning as a teaching strategy for facilitating student processing of information from theory to application to clinical proficiency. Research questions addressed the following: (a) How do ACIs in athletic training utilize questioning during field experiences to assist students in acquiring, retaining and utilizing athletic training skills and knowledge; (b) are the questioning techniques used by ACIs appropriate given the knowledge base and prior experiences of athletic training students (ATS); and (c) are the questions asked by ACIs during clinical field experiences facilitating student progression through the cognitive processing continuum?

Participants were eight ACIs and 24 ATS affiliated with an athletic training education program (ATEP) located in New England. The eight ACIs who participated in the current study represented 75% of the clinical instruction

staff at the site where data collection occurred. The number of male and female ACIs was equal. Participant demographics are presented in Table 1 (End of Chapter 4).

The 24 ATS who participated in the current study represented 28.2% of the ATS population at the institution where the study was conducted. ATS were participating in clinical experiences with either upper extremity intensive, lower extremity intensive; equipment intensive or athletic injury rehabilitation intensive clinical rotations at the time observations were conducted.

Data were collected through initial interviews, field observations, audio recordings, and stimulated recall interviews. Initial interviews were conducted with each ACI prior to beginning field observations. Each ACI was observed three times, with the exception of ACI Jamie, who was observed only twice. A third observation was not possible because the team for which Jaime was providing athletic training services ended their competitive season earlier than expected. Total number of field observations conducted was 23. Data sources are presented in Table 2 (End of Chapter 4).

Individual stimulated recall interviews were conducted with ACIs and ATS within 24 hours of completing each observation. Total number of stimulated recall interviews

conducted was 54. Audio recordings of initial interviews, stimulated recall interviews and conversations between ACI and ATS during field observations were transcribed into to text for data analysis.

Questions posed by ACIs were classified by cognition level according to Sellappah, Hussey, Blackmore and McMurray's (1998) question classification framework. Information, knowledge, application and comprehension level questions were classified as low-cognition questions while analysis, synthesis and evaluation level questions were classified as high cognition level questions. Yes/No, rhetorical and prompting questions were classified as other. A training session was held for the researcher, the critical friend and an expert in cognitive classification of questions on how to use Sellappah et al's (1998) question classification framework (Appendix G). Subsequently two raters coded 25% of the data sets. Inter-rater agreement of 83.9% was found. One rater classified the questions in the remaining data sets.

Results within chapter four are organized and presented in the following sequence: (1) Question Classification, (2) Themes, and (3) Conclusion.

Results

Question Classification

ACI posed a total of 712 questions during the 23 observation periods. Of the 712 questions posed by ACIs, 70% were classified as low cognition level questions and 17% were classified as high cognition level questions. The remaining 13% of questions were classified as other. Results of the question classification framework are presented in Table 3 (End of Chapter 4).

Themes

Data were analyzed through open, axial, and selective coding and coding for process. Three themes were identified through the data analysis process: (1) Approved Clinical Instructors in Athletic Training: promoting problem-solvers or training technicians, (2) Learning relationships in clinical learning environments, and (3) Athletic Training Student: active or passive participant. In each theme, a different perspective is presented to convey how the different perspectives within the clinical learning environment combined to provide a better understanding of instructional strategies used during clinical experiences.

Theme 1: Approved Clinical Instructors in Athletic Training: promoting problem-solvers or training technicians

Results presented within Theme One provide insight on how the ACI contributed to student development of athletic training skills and knowledge. The way the ACI facilitated the clinical experience either assisted the student in developing critical thinking skills needed for achieving clinical proficiency or in developing the ability to memorize and apply standardized response sets.

Analysis of data supported the development of three categories relating to how ACIs facilitated clinical experiences: (1) Beliefs and attitude (2) Teaching Strategies, and (3) Teaching Skills. Figure one (End of Chapter 4) illustrates how beliefs and attitudes, teaching strategies and teaching skills related to the way ACIs facilitated clinical experiences.

Beliefs and Attitudes. ACIs' beliefs and attitudes toward clinical experiences and clinical instruction appeared to relate to how ACIs facilitated the learning experience. Beliefs were defined as what ACIs perceived their primary purpose to be when participating in clinical experiences and how strongly they identified with their role as an approved clinical instructor. Attitudes were

defined as how ACIs enacted their beliefs during clinical experiences.

During initial interviews, all ACIs were asked questions intended to explore their beliefs surrounding clinical experiences and instruction. For example, ACIs were asked: "when you are working with a team and providing clinical supervision during clinical field experiences, how do you see yourself? What is your role"?

During field observations, ACI beliefs were seen being implemented by the way ACIs interacted with students and facilitated student learning. When ACIs were seen implementing beliefs that appeared to either contradict or support information obtained during the initial interviews, ACIs again were asked questions during the stimulated recall interviews that sought to further explore their attitudes and beliefs about clinical experiences and instruction. Analysis identified two divergent beliefs and attitudes groupings: beliefs and attitudes held by ACIs who identified as athletic training educators and ACIs who identified as athletic training service providers.

ACI as athletic training educators. ACIs who identified as athletic training educators tended to see his or her self as a facilitator of learning and were strongly committed to helping students become professional and

skilled problem-solvers. ACIs who identified as athletic training educators also appeared to consider all aspects of the clinical experience as potential catalysts for learning.

Sam, Maggie and Fischer were found to hold beliefs and demonstrate attitudes that most closely aligned with the ACI as athletic training educator group. Sam, a female ACI with 14 years of experience as an ATC and five years of experience as a clinical instructor, held dual credentials as an ATC and Licensed Physical Therapist. Sam was also a Graduate Teaching Associate (GTA) enrolled in the doctoral degree program at the institution where data were collected.

During the initial interview, Sam was asked to describe the role she assumes during clinical experiences. The response Sam provided illustrated how her beliefs guided her approach to clinical teaching. Sam stated:

> I think about this a lot. I could get my job done faster, be more efficient; get my athletes in and out faster if I wasn't being a clinical instructor. But it is the education component that makes it fun. It makes you slow down and facilitate the learning experience for the student. We are not training students to be aids or technicians, to assume positions where they have to know only how to do [a skill] but not why. We have the responsibility to educate our students to be professionals who know why and how, and then how to adapt [a skill] and to understand the consequences [of adapting it] (Sam, II).

When Maggie, the most experienced ATC/ACI in the study, was asked the same question, the response Maggie provided recognized responsibilities both as an educator and as a service provider. Maggie, a male ACI with 30 years experience as an ATC and 28 years of experience as a clinical instructor held dual credentials as an ATC and Licensed Physical Therapist. Maggie held faculty member status and had completed all but the dissertation component of his doctoral studies.

Through analysis of data collected from field observations and student comments, Maggie was found to demonstrate attitudes that suggested a strong commitment to and identification with athletic training education. Throughout the three field observations, Maggie was observed constantly and consistently interacting with ATS, spending the majority of time on student education and very little time on providing direct patient care.

Maggie devoted 80 minutes or 88.8% of the observed time interacting with students. Of those 80 minutes spent interacting with ATS, Maggie spent 46.2% of the time engaging students in question and answer sessions that utilized the Socratic method of questioning and targeted both high and low cognitive processing abilities. Maggie also spent 46.4% of time facilitating student problem-

solving skills as ATS attempted to apply and adapt skills during direct patient care interactions. And finally, Maggie supervised ATS without giving any form of feedback to the student only 7% of the time or six out of 80 minutes. Of the 90 minutes Maggie was observed, Maggie only spent ten minutes not interacting with students as he was providing direct patient and completing administrative tasks. Although Maggie verbally indicated he identified as a dual provider of education and service, his actions and interactions with students during field observations suggested his beliefs and attitudes toward clinical education and instruction were more closely aligned with ACI as an athletic training educator than with ACI as an athletic training service provider. The same held true for Fischer.

Fischer, a female ACI with two years of experience as a Certified Athletic Trainer was functioning as a Graduate Teaching Associate seeking a Master's level degree. When Fischer was asked to describe the role she assumes in the athletic training room during clinical experiences, Fischer stated:

> It depends on the situation. I make sure there is a lot time for learning and doing but when it is appropriate. Sometimes I stand back and observe. Sometimes I ask questions, give hints, help them figure things out. Can they justify the skill or why

> they are doing it? And sometimes I do things and talk to them about it either as I am doing it or after I am finished. So, my role, I guess, depends on the situation (Fischer, II).

Again, while Fischer described a dual role as service and education provider, student comments supported that Fischer demonstrated attitudes that suggested she viewed herself more as a athletic training educator than athletic training service provider. Ashley, a junior level ATS in her fifth clinical rotation was assigned to Fischer as her ACI. When asked to describe how Fischer facilitated her clinical experience, Ashley stated, "Fischer always finds something to talk about, something to ask me questions about. She tries to find something educational in everything we do. (FISCHER, SR2, ashbar).

Sam, Maggie and Fischer appeared to perceive their primary purpose to be providing clinical education during clinical experiences and demonstrated attitudes that suggested they identified as athletic training educators. Three additional ACIs, however, held different beliefs and attitudes that appeared to align more closely with the ACI as an athletic training service provider group.

ACI as athletic training service providers. ACIs who identified as athletic training service providers also tended to see their role educationally as that of clinical

supervisor. ACIs who identified as athletic training service providers were committed to helping students become skilled technicians and viewed clinical experiences as valuable opportunities to learn through watching and doing. Merlin, Sarah and War Horse most strongly identified with ACI as athletic training service providers.

Merlin, a male ACI with 14 years of experience as an ATC and seven years experience as a clinical instructor, held a Masters degree and faculty status. When Merlin was asked to describe the role he assumes in the athletic training room during clinical experiences, Merlin stated:

> I see myself more as a service person with thoughts in the back of my mind that I have students with me also. I need to be aware of their needs. My focus is to make sure that my athletes are being cared for and then, when time allows, working on education of students (Merlin, II).

War Horse, an ACI with six years of experience as an ATC and one year of clinical instructor experience, was a Graduate Teaching Associate seeking a Master's level degree. War Horse described his role in during clinical experiences in this manner. War Horse stated:

> You have your own perception of what needs to get done. I'm a doer, so it is hard for me to stand back and let the student have the experience. It gets hard for me to supervise students and get the team ready (WH, II,SR2).

When asked the same question, Sarah simply replied, "I do look at myself more as an ATC because I am just getting used to this ACI thing" (Sarah, II). Sarah was a female ACI with one year of experience as an ATC and was a Graduate Teaching Associate pursuing a Master's level degree.

Although Merlin, War Horse and Sarah all acknowledged his or her role as service provider and educator, field observations and student comments suggested that the beliefs enacted were that of ACI as athletic training service provider. Service provider ACIs appeared to prioritize patient care over student education.

For example, data collected through field notes revealed that out of the 90 minutes field observations were conducted of Merlin, he was observed interacting with his ATS 44 minutes or slightly less the half of the time. Of the time spent with students, 65.8% of the time was dedicated to patients care, directing ATS on which tasks to perform or providing ATS with instructions on how to perform specific tasks. The remaining 34.2% of the time spent with ATS during field observations was geared toward question and answer sessions that targeted low cognitive processing abilities.

When Callie, a junior level ATS who was completing her fifth clinical experience, was asked to describe the way

Merlin facilitated the clinical experience, her response supported that Merlin's attitude toward clinical experiences and instruction was that of an ACI who identified as a service provider. Callie stated:

> He doesn't ask a lot of questions to bounce the evaluation and conversation back and forth. If we get stuck, he doesn't say " well, what if" or ask a different question that makes us have to work through stuff to get the answer. He will explain what's going on or what he is doing. He sticks to a basic plan: this is what we are going to do and this is how we are going to do it. I don't think he really initiates other stuff" (Merlin, SR3, Callie).

ATS shared similar comments when asked to describe the approach War Horse and Sarah used to provide clinical instruction. Carolyn, a sophomore level ATS in her third clinical rotation described War Horse's style in this way. She stated:

> I guess you could say [War Horse] has an instructional style. We have a lot of athletes and he will say "okay go do this for that person". If I don't know how to do it, he will show me how to do it and then, I will do it, and we will do whatever we need to do next (WH, SR2, Carolyn).

And Emily, a junior level student in her fifth clinical experience, was asked to describe Sarah's attitude toward clinical teaching. Emily stated, "Sometimes I get the feeling from her that she doesn't feel the need to teach, but she is there only to supervise" (Sarah, SR3, EMS).

Again, beliefs were identified as what ACIs perceived their primary purpose to be when participating in clinical experiences and how strongly they identified with their role as an approved clinical instructor. ATS comments regarding the attitudes demonstrated by Merlin, Sarah and War Horse supported that Merlin, Sarah and War Horse saw their primary role as a provider of athletic training services and identified as service providers.

Beliefs and attitudes presented by Jaime and Spirit Wolf did not appear to strongly align with ACI as athletic training educator. Data analysis indicated that Jaime and Spirit Wolf aligned with ACI as athletic training service provider even less. Spirit Wolf, a male ACI with 21 years of experience as an ATC and 12 years of experience as clinical instructor, was also a Certified Strength and Conditioning Specialist, a Licensed Paramedic, and held a Master's level degree and faculty status.

Jaime was a female ACI, with one year of experience as an ATC and was a Graduate Teaching Associate seeking a Master's level degree. When asked to describe her role during clinical experiences, the response Jaime provided indicated that Jaime was trying to figure out her professional beliefs and attitudes. Jaime stated:

> It is my responsibility to see that students are doing things correctly. I make sure they are being educated enough so they can become an ATC. If we have an injury, depending on what that injury is and the level of the student, I may let the student take charge or I might. Then we talk about it (Jaime, II).

Beliefs and attitude toward clinical experiences and instruction was one of the three categories that were identified as relating to how ACIs facilitated clinical experiences. The second category identified was teaching strategy.

Teaching Strategy. The teaching strategies developed by the ACI for use during clinical experiences also appeared to relate to whether the ACI facilitated the development of student problem-solving skills or the development of memorization for application skills. Teaching strategy was defined as the purposeful selection of specific teaching methods in order to promote, support or enhance the acquisition, retention and/or refinement of skills and knowledge. Teaching strategies encompassed both the teaching methods selected and the ACIs' basis for method selection. Teaching strategy did not include the skill with which the ACI was able to implement his or her strategy.

During initial interviews, all ACIs were asked questions intended to explore his or her clinical

instructional strategies. ACIs were asked to describe the style or approach used when teaching students during clinical experiences. A typical follow-up question involved a quick member-check statement followed by a probe. For example, during the initial interview with Fischer, the follow-up question used was: "So you see questioning and role playing as your main methods of teaching"? [ACI responded "yes"] "Tell me more about why you have decided to utilize these particular methods"?

During field observations, ACIs were seen implementing his or her teaching strategy through the use of different teaching methods. When ACIs were seen implementing teaching methods that appeared to either contradict or support information obtained during the initial interviews, ACIs again were asked questions during the stimulated recall interviews that sought to further clarify information on his or her instructional strategies. Analysis identified two divergent groupings: student centered and instructor centered teaching strategies.

Student centered teaching strategy. Student centered teaching strategy was defined as the purposeful selection of specific teaching methods intended to facilitate active student involvement in the learning process in order to promote, support or enhance the acquisition, retention

and/or refinement of skills and knowledge. ACIs who possessed and implemented a student centered teaching strategy most often were those ACIs who: (a) demonstrated an understanding that information is processed at increasingly complex levels, (b) identified a teaching goal of helping students to develop advanced level schemas, (c) utilized strategic questioning as a core teaching method, and (d) actively sought to discover the learning styles and needs, and level of comfort and competence of ATS to whom they were responsible for providing clinical instruction. Data analysis identified Sam and Maggie as ACIs who most strongly represented ACIs who possessed a student centered teaching strategy for use in clinical experiences.

During the initial interview Maggie was asked to describe his approach toward facilitating clinical experiences. Maggie provided a response that indicated a goal of supporting the development of advanced level problem-solving skills and discovery learning through the use of student centered teaching methods. Maggie stated:

> I like to create situations where the students have to think. I think learning occurs when someone discovers the answer instead of being told the answer. The student will retain information better if they have to figure it out so I use questions a lot to help them think through things. I also give them questions to research so we can debate it during practice. I have them prepare role-playing scenarios and have students acting as the injured athlete, the athletic trainer

> and the instructor. I make them provide feedback to one another and critique each other (Maggie, II).

Maggie also voiced awareness that the teaching methods he selected were based on student abilities and student needs. During the first stimulated recall interview, Maggie was asked to respond to the following probe: "In saying that, it leads me to think that you might change your technique from student to student". Maggie responded:

> Oh, absolutely! I think if I had been working with the sophomore student who I am also supervising right now, this interaction would have been very different. She is very anxious and afraid to make a mistake. During scenarios and role-playing, she struggles thinking about the right answer instead of allowing herself to go through the process of finding the solution to the problem. So, I break things down for her. I give her more cues, more positive feedback. I also have two juniors in this rotation who are very strong junior level students. I have to directly challenge them by increasing the difficulty level or the pace or create more stressful situations where decisions need to be made quickly. I make them break things down to discover why a certain decision is better than a another decision by working backwards to find the beginning of the answer instead of ending up where the answer ends" (Maggie, SR1).

The response provided by Maggie illustrated an understanding that information is processed at different levels of complexity. Maggie shared how he changes his teaching methods to either increase or decrease the complexity of the questions or activities based on the level of comfort and competence demonstrated by the student. In the subsequent two stimulated recall

interviews, Maggie consistently provided responses that indicated possession of a student centered teaching strategy that guided his selection of teaching methods for clinical instruction. During the three field observations conducted on Maggie, he was observed consistently implementing student centered teaching methods.

Like Maggie, Sam was also found to possess a student centered teaching strategy. When Sam was asked to describe her approach to facilitating clinical experiences, Sam provided a response that clearly illustrated possession of a student-centered strategy. Sam stated:

> I first get an idea of where each student is academic level wise, learning wise and knowledge wise. I have them write down three strengths, three weaknesses, and three goals. I try to ask them about their learning style and how they like to interact with their ACI. I want to adapt to each athletic training student and facilitate the experience. I don't want to dominate it. I want to facilitate it (Sam, II).

During the first stimulated recall interview, Sam was asked questions intended to further explore her goal in interacting with ATS during clinical experiences. The goal Sam articulated demonstrated a desire to help students develop a system for processing information that would enable the student to problem-solve not only situations encountered in the current experience, but that could also be applied in future experiences. Sam stated:

> Not every thing is in the textbooks and sometimes you have to think through [the problem] to find a solution. I know that I teach the way I learn. I learn by understanding how I got to the answer that I eventually accepted to be correct. I think that I try to teach the process of getting to the answer more than I focus on the actual answer. I guess my big thing is to teach the concept not just the skill. I always want students to know what is going on in my brain and that I don't have all the answers to everything. But, I can think my way through it to find the answers by process of elimination, experimentation and experience (Sam, SR 1).

During all field observations conducted on Sam, Sam was observed consistently implementing student centered teaching methods that supported the possession of a student centered teaching strategy. Although all ACIs, with the exception of War Horse, were seen attempting to implement student centered teaching methods, not all ACIs possessed student centered teaching strategies.

Instructor centered teaching strategies. Instructor centered teaching strategy was defined as the selection of specific teaching methods that supported passive student involvement in the learning process with intentions of promoting, supporting or enhancing the acquisition, retention and/or refinement of skills and knowledge. ACIs who possessed and implemented an instructor centered teaching strategy most often were those ACIs who: (a) demonstrated an understanding that information needs to processed in order for learning to occur (b) identified a

generic teaching goal of helping students to learn, (c) utilized questioning to establish student knowledge and skill base and level of comprehension and (d) actively sought to determine student level of competence in order to determine level of student autonomy allowed during clinical experiences. Data analysis identified Merlin and War Horse as ACIs who most strongly represented ACIs who possessed an instructor centered teaching strategy for use in clinical experiences.

When Merlin was asked during the initial interview to describe the approach taken toward facilitating clinical experiences, Merlin provided a response that indicated an emphasis on teaching style instead of student learning styles. Merlin stated, "I'm a do as I do type of person. I'll show them what I am doing, have them repeat it and try to find what I found" (Merlin, II). And during stimulated recall three, Merlin was asked to describe how he determined if students understand the underlying concepts of a given skill. Merlin stated:

> I like to think that I have told them why but I can't say that I do that 100% of the time. I think that I am hoping that they are watching what I am doing and subconsciously, I believe that when they go back and do it again, that is when they begin to understand it (Merlin, SR 3).

Merlin appeared to equate student understanding and learning with repeated student replication of skills Merlin had previously demonstrated to the student. Emphasizing teacher demonstration and student replication as a way of facilitating learning was repeatedly described by Merlin in stimulated recall interviews.

Also, in each of the three field observations, Merlin was seen providing direct patient care and/or modeling how to perform specific skills associated with patient care more often than he was observed facilitating student refinement of direct patient care skills. Like Merlin, War Horse was also observed demonstrating or directing skill application more often then he was observed facilitating the clinical experience.

War Horse was consistently observed during the three field observations using teaching methods that supported the possession of an instructor centered teaching strategy. For example, in the interaction that follows, War Horse was seen and heard directing student action without allowing the student to self-determine which actions were appropriate to use given the information presented by the athlete.

Audio recordings and field notes for War Horse field observation three revealed that War Horse gave Ori, a

junior level ATS, the following instructions: "Do the SLR, Valsalva and supine to sit tests because he [the athlete] is having back pain" (WH-TS3). War Horse did not observe Ori perform the tests. Later, War Horse was heard and observed asking Ori for the findings and then telling Ori specifically which treatment protocol to follow. No discussion ensued to ensure that the tests were correctly performed. Nor did discussion occur that helped Ori relate symptoms to test, test findings to pathology and pathology to treatment.

During the student stimulated recall interview, Ori was asked how the interaction increased his understanding of low back pathology, evaluation and treatment. Ori responded: "He [War Horse] gave me instructions to do three specific tests, which I did. They were tests that I knew how to do, so I guess the only thing you could say that I learned was that my prior knowledge was refreshed" (WH, SR3-Ori).

During the ACI stimulated recall interview, War Horse was asked to clarify why he chose to facilitate the interaction as he did. The response provided by War Horse again supported possession of a teacher centered teaching strategy. War Horse stated:

> My first thought was, it is really busy in here and I need to get one of these students to do this evaluation. I knew Ori could do, so I had him do it. I wanted him to do a quick evaluation that addressed the concerns that I had for this athlete and narrow down the possibilities while still letting the athlete feel like someone was spending time with him. In the back of my mind, I knew what the injury was, so I told Ori which tests to do just so Ori could practice doing the tests again (War Horse, SR 3).

The way War Horse chose to facilitate the interaction with Ori illustrated that the teaching method was selected based on instructor needs not student needs. Although the student actively performed the skill sets as requested, Ori did not have to critically analysis the information in order to determine which tests were most appropriate to use. Nor did Ori have to actively analyze and synthesize the findings to create an appropriate treatment protocol. The teaching methods War Horse selected facilitated passive student involvement in the problem-solving and decision-making component of the interaction.

Data analysis supported that teaching strategies held by ACIs were either strongly student centered or strongly instructor centered or a mix of student and instructor centered. ACI teaching strategy was the second of three categories that were identified relating to how ACIs facilitated clinical experiences. The third category identified was teaching skills.

Teaching Skills. The skill with which ACIs were able to implement his or her teaching strategy during the clinical experiences also appeared to relate to whether the ACI facilitated student development of problem-solving or replication skills. Teaching skills was defined as the ability of the ACI to implement his or her specific teaching strategy and encompassed both the teaching methods selected and the implementation of those methods.

Teaching skills were identified through comparing the ACIs approach to clinical instruction as established during the initial interviews with data collected through notes and audio recordings taken during field observations, ATS and ACI comments during stimulated recall interviews and through classifying the cognition level of questions posed by ACIs during clinical experiences. Questions were classified using Sellappagh's et al (1998) adaptation of Craig and Page's (1981) Question Classification Framework. Through data analysis, ACI teaching skills were identified as either facilitating the exploration and creation of knowledge and skills or facilitating identification and replication of knowledge and skills.

Teaching skills that facilitated the exploration and creation of skills and knowledge were defined as teaching methods that stimulated discovery and creative learning.

Teachings skills that facilitated identification and replication of skills and knowledge were defined as teaching methods that stimulated memory learning. Teaching methods observed being implemented during field observations were questioning, simulations, summarizing, and modeling and demonstration.

Questioning. All ACIs utilized questioning during clinical instruction. Questioning was classified as either strategic questioning or non-strategic questioning. Strategic questioning was defined as adapting the timing, sequencing and phrasing of questions posed by ACI in order to facilitate ATS processing of information at increasingly complex cognitive processing levels. Strategic questioning was found to assist ATS in developing skills of knowledge exploration and creation. Strategic questioning was also found to support discovery and creative learning. Sam, Maggie, Fischer, Spirit Wolf and Jaime were identified as using strategic questioning.

Non-strategic questioning was defined as asking questions to stimulate student thought, but without purposefully adapting the timing, sequence or phrasing of questions in order to stimulate complex cognitive processing skills. Non-strategic questioning was used to assist students in recalling and applying information

during authentic or simulated problems encountered during clinical experiences. Non-strategic questioning supported memory learning and skills associated with identification and replication of knowledge. War Horse, Sarah and Merlin were found to use non-strategic questioning.

During stimulated recall interviews all ACIs were asked questions intended to engage him or her in discussions regarding questioning. During stimulated recall interview one, Sam was asked to describe and clarify her use of questioning. Within the response Sam provided, she: (a) described a strategic questioning plan, (b) demonstrated an understanding that information is processed through different levels of cognitive processing skills and (c) that questions need to be adapted to meet the needs of the learner and situation. Sam stated:

> Depending on the student and which grade level and what the expectations are, I try to gear the questions toward what the student should know. If they do know it, I try to take the student beyond that point and maybe learn something new. I use a "what, how, why" approach when asking questions. "What" questions are to make the student regurgitate basic facts they already know. "How" questions are to make the students apply what they know. I use "why" questions to help the student synthesize and analyze the situation; make the student problem-solve and figure out what they should do, why they should do and how it is going to be done (Sam, SR1).

Maggie, a second ACI who was found to use strategic questioning, was asked during stimulated recall interview

one to explain why he posed so many questions to his students. In responding, Maggie not only demonstrated his understanding of how information is processed, he also described a questioning strategy that was similar to questioning strategy Sam described. Maggie said:

> I think when you create situations where the student is either recalling, reviewing or recognizing information, which requires prior instruction, the student will retain it better if I use my questions to help them discover the answer for themselves. Anyone can recite words and concepts but making connections and understanding consequences is more difficult. They have to be able to recognize the differences in the separate components of a concept, figure how the components relate to one another and to the questions I am asking. They need to be able to recall the information, apply the information and then understand what they did and why they did it to the extent that it was done. They should be able to justify their decisions and actions (Maggie, SR1).

While data analysis identified Sam, Maggie, Fischer, Spirit Wolf and Jaimė as ACIs who used strategic questioning, Jaime and Spirit Wolf described his or her use of questioning differently than did Sam, Maggie and Fischer. Spirit Wolf was asked during stimulated recall three to describe his approach to questioning. Spirit Wolf stated:

> I don't consciously have a plan or map or outline that I follow. I think what I have is an idea of what I am going to do. I am looking to help them gain a deeper level of understanding. I want them to demonstrate a deeper level of knowledge. I like to guide them toward the answer (Spirit Wolf, SR3).

In his response, Spirit Wolf demonstrated only a basic awareness of the range of complexity with which information is processed and could not clearly articulate a specific plan to assist the student in navigating through the information processing process. When a similar question was posed to Jaime, she too, was unable to provide specific details on how she used questioning. Jaime responded, and stated, "I like to ask questions" (Jaime, II).

During field observations, Sam posed a total of 111 questions and was observed implementing a questioning sequence that incorporated a technique that Sam described as the what, how, why method. Maggie was found to have posed 225 questions and utilized a Socratic questioning method for promoting critical thinking. The Socratic method of questioning involved responding to ATS questions with questions until the moment occurred when the student discovered the answer for his or her self. Maggie used the Socratic questioning method so often that students were able to describe the method during stimulated recall interviews. As seen in stimulated recall interview three, when Dustin, a junior level ATS that Maggie supervised, was asked to describe a typical interaction between he and Maggie. Dustin stated:

> [Maggie] is not just going to give you the answer. He is going to ask you any number of questions and keep asking you questions until you come up with the answer. He won't just feed you the answer but maybe he gives you clues. It really is a lot better way to learn because it keeps me more active in thinking because it makes me work through it to get the answer (Maggie, SR 1, Dustin).

Jaime and Spirit Wolf also attempted to use the Socratic questioning method in conjunction with providing hints and clues and rapid fire questioning. Despite which method was used to ask questions, ACIs who demonstrated strategic questioning were also able to recognize teachable moment opportunities and to integrate strategic questioning with other teaching strategies.

For example, during field observation one, Sam was observed interacting with Jess, a student who was not assigned to Sam for clinical instruction. During stimulated recall interview one; Jess indicated that her intention in asking Sam for assistance was only to seek clarification regarding the stretch Jess had selected to perform on a patient. Sam was observed using her "what, how, why" questioning method to help Jess analyze certain aspects of the situation that eventually allowed Jess to answer her own original question. The conversation between Sam and Jess was documented through audio recordings taken during field observation one:

SAM: So what tissue is tight?
JESS: hamstring tendons.

SAM: And the hamstring tendons are? [ATS identifies HS tendons]. All right, in addition to those tendons, which by the way, I 100% agree with you, what else crosses right where you had your fingers? [ATS responds] Yes, you are correct! Which side is the pain on again? [ATS responds] What else is back there? What about the posterior tissues?
JESS: Well, the gastrocnemius inserts at the same place the hamstrings do.

SAM: Oh, so the gastroc crosses the knee joint as well? That would make the knee a 2 joint muscle right? So, let's think about this. It crosses the knee and the ……..? [ATS states: ankle] Right! So when this muscle contracts, how will that contraction affect the knee joint?
JESS: It will cause knee flexion.

SAM: Right! And how will it affect the ankle joint?
JESS: When it contracts, it will shorten and cause ankle plantarflexion.

SAM: Yep. Okay, so if you want to stretch a muscle, should you shorten the muscle or lengthen the muscle?
JESS: Well, stretching is lengthening the muscle.
SAM:So tell me how you are going to stretch this muscle?

JESS: Well, I can put him on the incline slant board or pro-stretch to get the ankle in dorsiflexion and I should make sure he keeps his knee in extension.
SAM: Sounds like you knew the answer all along and you were just testing me! Okay, now, tell me why you want to stretch out that muscle (Sam, TS1)?

The conversation illustrated how Sam was able recognize the teachable moment opportunity to act as a catalyst for discussion. Sam strategically sequenced her questions to stimulate cognitive processing abilities associated with identification, application, analysis,

synthesis and evaluation. As the conversation concluded, Sam began her questioning cycle again with the focus not on stretching the muscle but understanding when a muscle group should be stretched versus strengthened. By asking more low-level cognition questions than high-level cognition questions, Sam reinforced prior knowledge and set up a thought process for responding to higher-level cognition questions. By gradually increasing the complexity of the question, Sam was able to stimulate the student to critically think and problem solve the solution to the problem.

Maggie, Sam, and Fischer were able to describe his or her approach to questioning more clearly than were Spirit Wolf and Jaime. Data collected from recordings made during field observations and from comments made by ATS during stimulated recall interviews suggested that Maggie, Sam, and Fischer primarily used strategic questioning; Jaime and Spirit Wolf attempted to use strategic questioning but were not able to do so consistently. Even though Jaime and Spirit Wolf were found to be less skilled in strategic questioning than were Maggie, Sam, and Fischer, promoting the development of critical thinking through strategic questioning was supported by data collected from students during stimulated recall interviews.

During stimulated recall interviews, all ATS were asked to describe the cognitive processes they had to complete when responding to specific questions posed by his or her ACI. Some students embraced the challenge, while others felt more comfortable using lower cognitive processing abilities. Emily, a second semester junior student stated her preference in this way. "I'd rather have someone ask me why questions or make me defend what I am doing or why I thinking what I am thinking" (Sarah, SR 2, EMS). And another second semester junior student, Jess, was in agreement with Emily. Jess related,

> It would be easier and faster for her [the ACI] to say, "Yes, do it like that". Instead she made me prove to her that I knew what I was trying to do and why I was doing it. Now, I know that I am doing it right, why I am doing it and why it is correct. So, it is definitely good (Sam, SR1, Jess).

During stimulated recall interviews, ATS were asked to describe or explain how his or her ACI's use of questioning impacted learning experiences. In the passage below, Emily described how her perspective changed to meet the complexity of the question that the ACI used to challenge her. Emily stated:

> Some ACIs are too gentle and if you say you don't know it, they will say, okay, here is the answer. Spirit Wolf is sort of like that. Sam does not let me get away with saying "I don't know". She won't let me use that as an easy way out. She makes me go through the process of figuring it out and she makes ME do it.

> Then I do it and I get it and it stays in my head. It's not like being told the answer, which happens a lot if you let it" (Sam, SR2, EMS).

Students of ACIs who used strategic questioning all gave very similar responses. Ashley, a junior level student who was supervised by Fischer was asked during stimulated recall interview two to describe a typical interaction between Fischer and herself. Ashley stated:

> Fischer always finds something to talk about, something to ask me questions about. Sometimes she gives me the answer and sometimes she doesn't but that is because she is making me figure things out on my own. It is like problem solving, like what would I do if I were the ATC and there was no one else to ask? I have to figure out the answer by asking the right questions to get the information I need to make the decisions. She makes me look at different things and her questions make me narrow my thoughts and get rid of options that I can't support. And you know she knows the answer but she doesn't give you the right answer until you have committed a response (FISCHER, SR2, ashbar).

Ashley's description highlighted Fischer's use of the Socratic questioning method and confirmed that Ashley was stimulated to utilize higher-level cognitive processing abilities to respond to the questions Fischer posed. Throughout the three field observations, Fischer was recorded posing 90 questions. Of the 90 questions Fischer posed, 60% were classified according to Sellappah et al (1998) Question classification framework as stimulating low-level cognitive processing skills and 25.5% as

stimulating high-level cognitive processing skills. The remaining 14.44% were classified as other. By comparison, Spirit Wolf, who also attempted to use strategic questioning, was found to have posed 70% low-level cognition questions, 5.12% high-cognition questions and the remaining 24.7% as other. Though Spirit Wolf posed the second highest number of questions of all ACIs, at 117, Spirit Wolf was not as adept as Maggie or Sam at changing his questions to stimulate different cognitive processing skills.

Student descriptions regarding how Spirit Wolf used questions to stimulate thinking and enhance learning supported an inconsistent use of strategic questioning. One junior level student, Kristin, described questions asked by Spirit Wolf as "a lot of definition type questions. He will ask a lot of questions about what I am doing or what he is doing" (SPIRIT WOLF, SR2, Kristin).

However, the statements Stacy made regarding Spirit Wolf's questioning ability supported Spirit Wolf's use of strategic questioning. Stacy, a junior level ATS, described Spirit Wolf's questioning strategy as supportive and one that allowed her to progressively process information presented in the clinical experience. During stimulated recall interview one, Stacy stated:

> First, Spirit Wolf asks me what the problems are and then I have to explain everything to him. Next, he will ask me how I think it should be handled. I have to tell him what I think, what I want to do, how I want to do it and why. I think this is an excellent way to help me learn because he lets me think for myself and doesn't try to take over (SPIRIT WOLF, SR1, Stacey).

Analysis of data obtained from the question classification framework, and ATS/ACI comments made during stimulated recall interviews supported that Maggie, Sam, Fisher, Spirit Wolf and Jaime attempted to use strategic questioning more often than non-strategic questioning. In contrast, analysis of data supported that Merlin, Sarah and War Horse used non-strategic questioning more often than he or she used strategic questioning.

Descriptions provided by Merlin, Sarah and War Horse regarding his or her use of questioning were less detailed and focused. When asked to describe his questioning strategy, Merlin stated: "Oh, why do I ask questions? Just because! I am trying to remember why" (Merlin, SR3). Sarah responded by stating: "I come from the old school of let's get it done and if there are questions, ask them later" (Sarah, SR2). And when Ori, a junior level student, was asked to describe the questioning strategy War Horse used for asking questions, Ori replied:

> I don't believe [War Horse] has a well-designed or well thought out strategy. He just seems to ask

> questions out of the blue, like more off the top of his head. What he does most of the time is along the lines of quick-fired questions, telling us what to do, and giving us directions (WH, SR3, Ori).

Merlin further demonstrated the use of non-strategic questioning during stimulated recall interview one, when Merlin explained how he used questioning as a way to establish student knowledge base and comprehension level. Merlin stated:

> I just drill the students about things. I want to make sure that they know what they are doing. I lead them along through each step of the protocol to make sure they know how to do it. I try to make them understand which placement method to use. The way I am asking them the question puts the answer out in front of them, so they have a 50/50 chance of getting it right. I also think out loud so the students can hear the question and the answer. That way I know that they have been told the correct way to do it (Merlin, SR 1).

The response made by Merlin also illustrated his understanding that information must be processed as part of the student learning experience but suggested that Merlin saw the application level of cognitive processing as most important to the student learning experience. When ATS comments regarding Merlin's use of questioning were compared with data collected from the questioning classification framework (Sellappagh et al., 1998), data analysis supported that Merlin primarily targeted low level cognitive processing skills.

ACIs who used non-strategic questioning, Merlin, Sarah and War Horse, asked less questions than did ACIs who used strategic questioning. ACIs who used non-strategic questions asked more lower level cognitive processing questions than did ACIs who used strategic questioning. Of the 712 questions posed by ACIs during field observations, Merlin only posed 52 or 7.3% of all questions asked. 88.46% of questions Merlin posed were classified a targeting information, knowledge, application and comprehension level questions. Merlin did not pose any questions that targeted high-level cognitive processing skills. Sarah posed 26 or 3.65% of all questions asked. And War Horse posed 71 or 9.97% of all questions posed.

Examples of non-strategic questions posed by War Horse, Merlin and Sarah included: "Notch it for the final strip. You got that?" (War Horse, Field observation 3), "Hey, Ryan, do you want to make sure he is getting a good hamstring stretch?" (Merlin, Field observation 3), and from Sarah, "Alright, do you want to write it up in the report now and then we can put it in her file tomorrow" (Field observation 1)?

When ATS were asked to describe the way his or her ACI used questioning, ATS responses supported that Merlin, Sarah and War Horse used non-strategic questioning. During

stimulated recall two, Emily described Sarah's questioning style in this manner. Emily stated:

> She [Sarah] makes it seem like the questions that she asked aren't all that important. Sometimes it doesn't even seem like she really cares about the answer, like she is just asking questions because she knows she is suppose too" (Sarah, SR 2, EMS).

Merlin's use of questioning was described in this manner by junior level ATS Sarah. Sarah stated:

> I was having a hard time understanding muscle energy technique and Merlin would just keep showing me it again and again. His questions were like "do you understand why I am doing this" or "do you understand what we are doing"? The questions he asks don't really make me, I mean they don't help me figure things out, it's just like either I understand it or I don't and that is what he wants to know. That's pretty much all he ever asks. He doesn't really ask us for our thoughts or opinions. (Merlin, SR1, Sarah).

In both descriptions, ATS responses revealed that the questions posed by Merlin and Sarah did not stimulate complex cognitive processing skills, did not cognitively challenge the student and were non-strategic.

Questioning was identified as a teaching skill because the teaching method selected was questioning, and strategic or non-strategic was the way method was used in support of implementing ACI teaching strategies. The second teaching skill concept to be identified was simulations.

Simulations. Simulations were defined as events created by ACIs during clinical experiences that mimicked

actual events the student might encounter in the work environment. Simulated events included the use of role-playing and scenarios that were based on authentic or simulated patient care interactions.

The ability to facilitate simulations differed among ACIs. Three example sets were found that illustrated how different ACIs were able to use simulations. For the first example set, Fischer and Maggie were selected to illustrate how certain ACIs were able to use simulations in assisting students to develop problem-solving skills.

During stimulated recall interview two, Ashley, a junior level student, described how her ACI, Fischer, used a simulation role-playing activity called "problem of the day". Of the eight ACIs in the study, Maggie, Sam, Fischer and Jaime were found to use an activity that students specifically called "problem of the day". Ashley described how Fischer gradually increased the complexity of the simulation through a Socratic questioning method and how the questions Fischer posed challenged Ashley to solve the problems presented in the simulation. Ashley described her interaction with Fischer:

> Sometimes when we are out on the field, we have a "problem of the day". Sometimes we know ahead of time and we each had to research it or we would each be given a certain viewpoint we had to defend. But, usually it was some topic like concussions. We go over

> things like how concussions should be evaluated. Then she [Fischer] would say, "How do you know that this person has had a concussion?" Then we talk about that for a while. Her next questions would be something like "How do you know that the athlete is ready to return to play?" She continues to ask us harder and harder questions about that topic or that problem (FISCHER, SR2, ashbar).

Maggie was also described as creating injury simulations where students were assigned different roles within the scenario. When asked during stimulated recall one, why he used role-playing and scenarios, Maggie responded:

> I think the learning situation requires that the student think at different levels other than just memory. I like to use scenarios and role-playing to help the student learn how to transfer that knowledge to a real situation. I try to make them think on their feet, problem solve, let them struggle a little bit. I want to make it as practical as possible and create situations where students discover the answers for themselves (Maggie, SR1).

ATS descriptions of how Maggie used simulations during clinical experiences supported that students had to utilize high-level cognitive processing skills to determine appropriate response. In stimulated recall one, junior level student Jess explained her thinking process when participating in a simulation activity created by Maggie. Jess stated:

> [Maggie] gave Dustin and me an injury scenario and Dustin was the athlete and I had to figure out what the injury was. Dustin had to come up with all the signs and symptoms to act it out but I had to do the

> evaluation. Maggie let us go through it until I got stuck and then he'd give me a clue or hint that made me review what I did or what I knew. That reminded me of something I forgot or something that I needed to do differently. When I am going through the evaluation, I don't know what the injury is so I am trying to narrow things down and come up with a conclusion. I am trying to figure out what it could or couldn't be. Maggie comes up with questions to get me thinking in a different way and that helps me figure out the injury (Maggie, SR 1, Jess).

In the second example set, Merlin was selected to illustrate how certain ACIs were able to use simulations in assisting students to recall and apply information. Ryan, a sophomore level student, described how his ACI, Merlin, facilitated injury scenarios. Injury scenarios and role-playing were found to be the most common type of simulations utilized and were used by all ACIs except War Horse and Spirit Wolf. During stimulated recall three, Ryan stated:

> During games, Merlin gives us situations. There were three of us, so he gave each of us an injury scenario. He'd give us the background and then make us go through it. He wouldn't ask us questions, except, "What would you do". We would run through the whole process and unless we left something out, he wouldn't stop us or ask us questions (Merlin, SR3, Ryan).

The response Ryan provided illustrated how Merlin attempted to utilize two different teaching methods, questioning and scenarios. The description Ryan provided suggested that the questions posed by Merlin and the way Merlin facilitated

the injury scenario reinforced application knowledge and not critical thinking.

In the final example set, Sarah was selected to illustrate how certain ACIs were unable to utilize simulations even though an attempt was made to do so. During field observation three, Sarah was observed instructing Kristin, a junior level ATS, to assume the role of injured athlete. Sarah directed Emily, another junior level student, to evaluate the simulated injury. Both Sarah and Emily were asked during stimulated recall interviews to talk about the role-playing simulation.

Sarah responded, "I don't normally do scenarios. See, I am not very good with coming up with my own ideas on injuries and role-playing" (Sarah, SR3). When Emily was asked to describe how the interaction contributed to her educational experience, Emily stated:

> I think role-playing is okay, but I didn't like it this time because it didn't get my mind working, so I don't think it was a good learning experience. She [the ACI] hates scenarios. She didn't even really want to do one today. She lost interest in it by the end. I don't even think she [the ACI] heard my final clinical impression (Sarah, SR3, ems).

Both from a student and instructor perspective, the interaction did little to promote critical thinking. The injury scenario witnessed during Sarah's field observation

three was representative of how Sarah facilitated any simulation activity she attempted.

Summarization. The third teaching skill to be identified was summarization. Summarization was defined as encouraging the student to verbally reflect on aspects of a given task or event within a given set of parameters. Parameters were determined by the ACI. All ACIs required students to summarize but not all ACIs did so with the same intent or skill level. Analysis of data from ATS/ACI stimulated recall interviews, ACI initial interviews and field notes suggested that ACIs used the summarization techniques one of two ways; either prompting the student to critically think or prompting the student to update the ACI on some aspect of patient care.

Maggie was consistently observed during each of the three field observations asking his students to think out loud or summarize what was known about a given topic. When asked during stimulated recall two to describe his purpose in requiring students to summarize, Maggie's response indicated a desire to assist the student with critical thinking. Maggie stated:

> I try to stimulate metacognition. We all do this. We periodically think about "do I understand what is going on here? What do I think? Why do I think that and what I have seen that supports that line of thought? I really want the students to do this because

> this is what we do when we evaluate injuries. I think learning occurs when someone discovers the answer. I think that within this discipline, we have the luxury of teaching the students how to think and working on problem solving (Maggie, SR2).

Maggie and Sam were observed using summarization for the specific purpose of enhancing the student's thought processes. During the first stimulated recall interview, Sam identified why she had students summarize his or her thoughts out loud and why she summarized her own thoughts out loud for students to hear. Sam stated:

> I was trying to teach a process more than get the student to actually give an answer. I teach the way I learn and I learn by understanding how I get to the answer, not by memorizing the answer. I go through a process and I want the student to know what is going on in my head so they have a model of how to think through it, and how to apply it (Sam, SR1).

ATS were asked during stimulated recall interviews to share their thoughts on how required summarization affected their learning experiences. Emily, a junior level student who Maggie had interacted with during field observation three disclosed how Maggie's prompts helped enhance her thinking process. Emily stated:

> Sometimes I have so much going on up there in my head that I get scattered. Maggie makes you explain your thoughts out loud. That makes me see where I am going or why I am developing a certain thought, and why I would even think it! (Maggie, SR3, EMS).

Jess described why she needed to learn how to organize her thoughts and how certain aspect of Sam's teaching style helped her. Jess said, "Sometimes I can't put it all

together in my head. Sam helps me to look at the pieces and then helps me put them together" (Sam, SR1, Jess).

Stacy was observed during field observation one being asked by Spirit Wolf to summarize short and long-term goals. During the stimulated recall interview, Stacy was asked to talk about some of Spirit Wolf's teaching methods that she found to be helpful. Stacy stated:

> After each evaluation [Spirit Wolf] always asks me to summarize the short and long-term goals. I have to explain what I am going to do to help the patient reach those goals and describe what specific approach I need to take. After that, we talk about it, and he asks me questions about what I have decided to do. I like doing it this way because I feel like I have a complete understanding of why I am doing what I am doing and how to do it. I have to be able to say it out loud for him so I that means I need to get it all organized in my head first. It helps me to think logically (Spirit Wolf, SR 1, Stacy).

ATS descriptions of the way Maggie, Sam and Spirit Wolf used summarizations supported that some ACIs were able to use summarizations to promote critical thinking. Data analysis supported that Maggie, Spirit Wolf, Jaime and Sam utilized summarization to help the student to (a) organize and refine the thinking process, (b) increase the ability to identify relevant from non-relevant information and (c) enhance and promote clinical decision-making. Data analysis also supported that some ACIs used required student

summarization in a way that did not support critical thinking.

War Horse, Merlin and Sarah were found to use summarization primarily to gain information on the status of the athlete, injury or treatment program. The way War Horse used required summarization was typical of how both Merlin and Sarah used required summarization during field experiences.

In each field observation conducted on War Horse, War Horse was observed asking ATS to summarize information relating to patient care. War Horse was also observed directing ATS to summarize only specific aspects of patient care and giving the student narrow parameters for summarizing. He did not phrase the questions in such a way as to promote student reflection or encourage ATS to determine relevant from non-relevant information. For example, during field observation one, War Horse was heard discussing with Ori an injury evaluation that Ori was in the process of conducting. Ori was a junior level student who was completing his fifth clinical rotation and who had completed all didactic classes associated with injury assessment. The interaction started when Ori asked permission from War Horse to evaluate an athlete who had injured his right ankle. Ori began the evaluation while War

Horse provided treatment for a different athlete. When War Horse returned, War Horse immediately began asking Ori questions regarding the patient:

> War Horse: What did you do?
> Ori responds.
> War Horse: What is causing him pain?
> Ori responds.
> War Horse: Which tests were positive?
> Ori responds.
> War Horse: Any point tenderness? Where is he sore?
> Ori responds.
> War Horse: Okay, so this looks like an ATF sprain. We need to get him into the compression boot with ice for 20 minutes. Okay? Any questions?

The questions War Horse posed focused on the findings and not on the steps Ori completed in order to process the information he obtained through the evaluation. War Horse asked Ori to summarize information that War Horse thought was relevant in developing a clinical impression and a treatment plan but did not allow Ori the opportunity to draw those conclusions for himself. When summarization was used in this manner, the ACI was not supporting the development of student problem solving or critical thinking skills but rather confirming the ability of the student to replicate skills as directed by the ACI.

Student descriptions confirmed that being asked to summarize information for purposes of updating the ACI on patient status did little to advance critical thinking and problem solving skills. During stimulated recall interview

three, Ori was asked how having to restate parameters he selected for an electrical stimulation treatment contributed to his knowledge base. Ori stated:

> War Horse told me to set up an athlete on estim. I went over to the estim unit, selected the protocol and set the patient up. War Horse came over and I had to tell him what I was doing. He said fine, go ahead. That was the end of the interaction, no further discussion. I would like it better if he challenged me or we talked about things in greater depth. I just tell him what I am doing and he says "fine" and I keep doing it or he says "no, do it this way" and then I do it his way (WH, SR3, Ori).

ACI Sarah was also observed directing students to summarize findings to elicit information on patient and injury status. Junior level student Emily was asked during stimulated recall interview two to talk about how Sarah facilitated interactions during the clinical experience. The response Emily provided supported that the way Sarah used summarization promoted replication of skills. Emily stated:

> Sarah doesn't really explain things or teach very well. I think if I was straight out wrong, she would stop me, but Sarah takes your word for it and lets you go. It is difficult to get her to say yes or no about what I am saying or doing. She has her own patient load and takes care of those athletes, and I feel like I am just following her instructions. She checks up on me and as long as I tell her I am doing what she has written in the chart, then I am good to go (Sarah, SR 2, Emilystr).

Summarization was identified as a teaching skill because the teaching method selected was summarizing, and

the way the method was used either promoted student skills of critical thinking and problem solving or as a method of updating ACIs on the status of patients, injuries and treatment plans.

Modeling and demonstration. Both modeling and demonstration involved applying athletic training skills and knowledge in the clinical setting. Modeling was defined as an unconscious act, in which the ACI made no deviation from his or her normal patterns of behavior to accommodate for student learning but expected that the ATS would watch the actions and "learn" from watching.

Merlin was very upfront about his use of modeling during clinical experiences. During the initial interview, Merlin stated "I'm a do as I do type of person" (Merlin, II). Students appeared to respond to Merlin's use of modeling in different ways.

Ryan, who was in his third clinical experience, described how Merlin used modeling during an injury evaluation. Ryan stated:

> Merlin does everything very quickly and doesn't follow the sequence, step by step. He goes right to it, but I can't do that. I have to start from the top and work my way through to the end. I have to think about each step but he goes right through it. He has the knowledge to eliminate the ones he doesn't need. I try to pick up on how he does that (Merlin, SR3, Ryan).

Merlin also supervised Callie. Callie was a junior level student in her fifth clinical rotation and had completed all assessment coursework. Callie internalized similar interactions with Merlin differently than did Ryan. Callie stated, "Merlin tells you more than asks you. Sometimes he is not very clear about why he does what he does. But other times I can follow him perfectly" (Merlin, SR1, Callie).

Field notes supported that ACI Sarah spent 1/3 of clinical instruction time modeling direct patient care skills. Descriptions provided by ATS Kristin in stimulated recall interview one supported that it was difficult for Kristin to advance her skills and knowledge beyond the application and replication phase with the modeling approach to teaching that Sarah used. Junior level student Kristin stated:

> Basically the only way that I have interacted with Sarah is when I go to her with questions. She has her own patient load and does her own thing. Like in the interaction we just listened to [a recording of an interaction between Kristin and Sarah taken during field observation 1] she was treating this athlete and I was just standing there watching her for about ten minutes. I was interested in what she was doing because I had never seen this injury before so I started asking her questions. You have to go into specifics with Sarah because she doesn't. She is like "this is what is going on and this is what I am doing" (Sarah, SR 1, Kristin).

ATS Emily provided further support during stimulated recall interview two that Sarah's approach to teaching did little to advance her skill and knowledge level beyond basic cognitive processing abilities. During field observation two, Sarah was heard telling Emily to design a rehabilitation protocol for an athlete who had sustained a patellar subluxation.

Sarah did not provide Emily with guidelines to follow nor was Sarah observed or heard challenging Emily once Emily presented the protocol to Sarah for approval. During stimulated recall interview two, Emily was played a recording of the actual conversation between she and Sarah regarding the treatment program. When Emily was asked how she determined what elements to include in the program,

Emily began to laugh. Emily stated:

> I know! I know! I did exactly what we are NOT supposed to do. I followed a checklist and did what was on my checklist. I've never dealt with a patellar sub-luxation so I just took the knee rehab sheet and told Sarah that was what I was going to do! I just fell into that whole "thinking inside the box" thing because honestly, Sarah never asks me any hard questions. I am never worried about being wrong with her because she doesn't really put that much into it. I just did this and gave it to her because I knew if it was wrong, she would change it and I wouldn't have too (Sarah, SR2, Emilystr).

Demonstration differed from modeling and was defined as the conscious application of psychomotor, cognitive or

affective skills and knowledge in a step-by-step manner for the specific purpose of teaching. In the following passage, Maggie described how he used demonstration during an interaction that occurred between he and Jess, an ATS who Maggie was supervising.

Maggie and Jess were nearing the end of an athletic injury assessment when Maggie stopped and began summarizing his thoughts. During the stimulated recall interview, Maggie was asked why he chose to summarize his thoughts out loud. The response Maggie gave clearly indicated that he was using demonstration as a teaching method. Maggie stated:

> I had a very specific purpose for this interaction and that was for Jess to decide if the athlete should participate. I was trying to get her to think through making a decision. I knew Jess was watching me and was processing what I was doing. At this point, I began summarizing all the findings, in a specific time line and verbally sharing the factors that I needed to consider in making the return to play decision. Even though I was being more of a service provider, I was demonstrating my thought process so that Jess could hear that process (Maggie, SR1).

During field observation two, Sam was observed demonstrating a gait assessment and heard verbalizing her findings for Emily, a junior level ATS student. Sam was asked during the stimulated recall interview why she chose to perform the assessment instead of allowing Emily to do so. Sam replied:

> Emily was doing things sporadically. She wasn't always giving me the correct responses to the questions I asked. I was very conscious of letting her problem solve but I wanted her to be correct in what she was doing and thinking. I decided that it would be more beneficial if we went through the assessment together. I started by stating the steps I was going to take to perform the assessment, as if I was letting the athlete know what to expect. Really, I was doing it for Emily. Then I turned to Emily and told her the things I was going to look for during the assessment. When the athlete started walking, both Emily and I were stating our findings. She was able to hear and watch me and compare what I was finding with what she was finding. By the end of the assessment, it was more Emily doing the assessment on her own than it was me guiding her (Sam, SR 2).

Demonstration was identified through data analysis of ATS stimulated recall interviews as supporting student development of critical thinking and problem solving.

During field observation one, Jess was heard seeking confirmation from Sam of the appropriateness of a specific stretch. Sam was then seen demonstrating the stretch on Jess and heard asking Jess a series of questions regarding the stretch. During stimulated recall interview one, Jess was asked to describe the interaction. Jess stated:

> Instead of telling me what to do, Sam asked me more pointed questions about the stretch. Maybe she already knew the answer because she had done it a 100 times but she took me through the steps, made me go through the process so I would figure out the answer for myself. I think I was able to retain the information better because she made me go through that process (Sam, SR1, Jess).

The response Jess gave illustrated how Sam's use of demonstrations helped Jess to think more critically in order to find a solution to the problem. The response provided by Jess was representative of other ATS described ACI's use of demonstrations to promote critical thinking.

Questioning, simulating, summarizing, and modeling and demonstrating were identified as teaching skills. Teaching skills was defined as the ability of the ACI to implement his or her specific teaching strategy and encompassed both the teaching methods selected and the implementation of those methods. War Horse, Sarah and Merlin were identified through data analysis as ACIs who used modeling as the primary method of teaching during clinical experiences. Spirit Wolf, Jaime and Fischer were identified through analysis of data as ACIs who transitioned between modeling, demonstration and questioning. Maggie and Sam were identified as ACIs who used questioning and simulations along with demonstration as primary methods of teaching during clinical experiences.

ACI beliefs and attitudes, teaching strategies and teaching skill related to how ACIs facilitated the clinical experience. The way ACIs facilitated clinical experiences was described through theme 1: Promoting problem-solvers or training technicians. Analysis of data supported that ACI

beliefs and attitudes, teaching strategies and teaching skills assisted the student in developing critical thinking skills needed for achieving clinical proficiency or facilitated the promotion of memorization to apply a standardized response set.

Theme 2: Creating and nurturing learning relationships to establish enriching clinical experiences

Results presented within Theme Two illustrate how the development of a learning relationship between the ACI and ATS contributed to the overall learning environment of clinical experiences. Learning relationship was defined as interactions between ATS and ACI during clinical experiences that contributed to ATS acquisition, retention and advancement of athletic training skills and knowledge.

Learning relationship was identified through analyzing data obtained from notes and audio-recordings taken during field observations, and stimulated recall interviews with ATS and ACIs. Member checking during each subsequent stimulated recall interview further clarified the existence of learning relationships.

The learning relationship appeared to be important in supporting both the affective and cognitive tone of the learning environment. As depicted in Figure 2 (End of Chapter 4), four categories of ACI/ATS behaviors

contributed to the development of a learning relationship: awareness, confidence, level of supervision and enthusiasm.

Awareness. Both the ACI and ATS levels of awareness were found to be important in how the learning relationship developed. Learning relationships developed and deepened as ACIs awareness and understanding grew of (a) how the student preferred to learn and process information, (b) the skill and knowledge base the student possessed and (c) the level of comfort the student experienced during clinical rotations. As ATS awareness and understanding increased of what the ACI expected and how familiar the ATS became with ACIs' teaching strategies and skill, the learning relationship was further strengthened. During stimulated recall interviews all ACIs and ATS described events, thoughts or feelings that illustrated the learning relationship concept.

ACI Jaime demonstrated awareness of her student's learning style when she described this interaction with Cam, a sophomore level student. During stimulated recall one, Jaime stated, "I could see his wheels turning, see him going through his Rolodex, so I waited until he spit the answer out. He needs time to think" (Jaime, SR-1). Cam confirmed Jaime's observation when Cam was asked during stimulated recall interview one to describe his

interactions with Jaime. Cam stated, "She allows me to do a lot on my own with her watching me. She is letting me get use to formulating my own ideas based on the knowledge that I have (Jaime, SR1, Cam).

Not all ACI demonstrated an accurate awareness of his or her student's preferred learning style. During stimulated recall two, Emily, a second semester junior student was asked whether or not ACI Sarah's teaching style matched Emily's learning style. Emily replied "no, not really. I'd rather have someone ask me "why" questions or make me defend what I am doing or why I thinking what I am thinking. She just takes what you say and tells you to go with it" (Sarah, SR 2, EMS).

ACI awareness of the knowledge level and skills the student possessed individually as well by class also contributed to the development of the learning relationship. During field observation one, Maggie was observed assigning different roles within an injury scenario to different students. When asked during the stimulated recall what factors Maggie considered when assigning roles, Maggie revealed a high level of awareness for the skill and knowledge base each student possessed. Maggie described how knowing the students' abilities helped

him to create meaningful learning environments. Maggie stated:

> I think how you work with a sophomore and how you work with a junior or senior level student is different. In both cases, I spent a lot of time with the students, and I got to know them pretty well. I knew how far I could push them and what they should be capable of doing (Maggie, SR1).

Nikki, a junior level student in her fifth clinical rotation, was able to support Maggie's statement. During stimulated recall three, Nikki related: "he knows our level, what we should know, what we should be able to do. And when I don't, he knows how to guide me or explain it in a way that jogs my memory or helps me figure it out" (Maggie, SR-3, Nikki). In contrast, other students provided examples of how learning experiences were negatively affected when facilitated by ACIs who lacked awareness of the differences between the class levels.

In stimulated recall one, Lisa, a sophomore student in her third clinical rotation, described an interaction that occurred during her first clinical rotation. The interaction was with Fischer, an ACI new to the institution. Fischer was in her first experience as an ACI. Lisa stated,

> I came in during pre-season so I didn't know much. Fischer would ask me really hard anatomy questions, or want to know what I thought the clinical impression was. I thought I was way behind. I got really

> frustrated because I didn't know what she was talking about. I talked to some other students and they told me not to worry because I would be learning all that stuff later in [professor X] classes (FISCHER, SR1).

Because Fischer had a decreased awareness of the knowledge and skill base typically possessed by sophomore level students, Fischer inappropriately challenged Lisa on content that was too advanced for the student. Fischer created a learning environment that Lisa inferred was less than nurturing and the learning relationship between Fischer and Lisa were weakened.

The level of awareness the ACI possessed regarding how comfortable the student was in the clinical environment and in applying their skills and knowledge also affected the learning relationship. Comfort was a term often used by ACIs and ATS to describe a type of learning environment or interaction that supported and promoted student learning during clinical experiences.

For example, Fischer used student comfort as one indicator of how intensely to challenge her students. During stimulated interview two, Fischer described how she either softened or intensified her challenges for students depending upon what she perceived to be the comfort level of the student. Fischer explained "students tend to show it when they are uncomfortable. They tend to carry

themselves uneasily in the situation, so I will start breaking it down for them, asking simpler questions" (FISCHER, SR 2).

From a student perspective, developing a learning relationship necessitated gaining awareness of the skills and abilities used by his or her ACI during clinical experiences. Callie, who was supervised by Merlin, was participating in her second clinical experience with Merlin. Comments Callie made during stimulated recall interviews suggested that Callie felt her prolonged interactions with Merlin over the length of two clinical rotations allowed her to gain an increased awareness of how Merlin teaches and what he expected of her. During stimulated recall three, Callie stated, "I have picked up on how Merlin thinks. He has his school of thought and he sticks to it. I guess I have taken the initiative to figure it out" (Merlin, SR3, Callie).

Junior level student Emily was asked questions during the three stimulated recall interviews that were intended to explore the learning relationship between she and Sam, her ACI. During stimulated recall interview three, Emily was asked if the way Sam interacted with her had changed over the length of the clinical experience. Emily responded:

> I am not sure if she has changed or we have both adapted. I do know the way I react to her has changed because I think now I know what to expect from her, what to expect in working with her and what she expects from me (Sam, SR3, EmSt).

The response Emily provided illustrated the existence of a growing and changing learning relationship based on both people gaining an increased awareness of what each expects of the another person.

ATS awareness of the teaching strategies the ACI used and how familiar the ATS were with those strategies also influenced how the learning relationship developed. Ellie, who had been supervised by four different clinical instructors during various clinical experiences, synthesized typical ACI teaching strategies into one concept during stimulated recall interview two. Ellie stated:

> With most of the clinical instructors here, I find that they will push you and make you work through it and help you toward finding the correct answer. I know that I have to work through it, put the pieces together and figure it for myself but they have a way of pushing me along that process" (WH, SR2, Ellie).

Within her response, Ellie was able to describe challenging interactions with ACIs who set high expectations but at the same time were supportive and nurturing. Dustin, a junior level student in his fifth

clinical rotation, was able to give a very specific example of being challenged yet supported at the same time.

Dustin was asked during stimulated recall three to describe a typical interaction between he and his ACI, Maggie. Dustin stated, "If you ask Maggie a question, he is not going to come right out and give you the answer. He is going to ask you any number of questions and keep asking you questions until you come up with the answer yourself" (Maggie, SR1, Dustin). Not only was Dustin able to realize he was being challenged yet supported at the same time, Dustin also demonstrated awareness that Maggie used questioning as his primary method of teaching. Many ATS were aware that different ACIs used questioning differently.

ATS Kristin was observed interacting with Maggie and Spirit Wolf during two different field observations. Kristin related that questions posed by Spirit Wolf seemed different to her than those posed by Maggie. In stimulated recall interview two, Kristin pointed out that "Maggie teaches through asking questions, through explaining, giving a little information and then asking us more questions until we can put it on our own words" (Maggie, SR2, Kristin). "Spirit Wolf", Kristin said, "tends to ask a lot questions, looking for definitions; a lot of questions

about what I am doing and about what he is doing" (SPIRIT WOLF, SR2, Kristin).

Some students demonstrated awareness of when an ACI possessed weak teaching strategies. When asked to describe how Merlin facilitated her learning process, Sarah replied, "I think he needs lesson plans or something. He just seems very set in his ways and his questions are like "do you understand why we are doing this?"" (Merlin, SR 1, sarah). The response provided by Sarah suggested that the approach Merlin took to facilitating clinical experiences did not match Sarah's needs as a learner. Sarah's increased awareness of how Merlin taught combined with Merlin's decreased awareness of Sarah's needs as a learner created a weakened learning relationship.

ACI and ATS awareness contributed to the development of the learning relationship. The strength was either increased or decreased dependant upon ACI/ATS levels of awareness. The second category identified as contributing to the development of the learning relationship was confidence.

Confidence. Confidence was defined as belief that one's athletic training skills, abilities and knowledge are correctly and appropriately applied. Both ACI and ATS confidence appeared to contribute to how the learning

relationship developed. Confidence was identified through comparing comments shared by ACIs during the initial and stimulated recall interviews with field observations and comparing comments shared by ATS during stimulated recall interviews with field observations.

During field observations, both Sarah and War Horse were seen providing direct patient care more often than they were observed interacting with ATS. Responses provided by both War Horse and Sarah indicated that confidence played a role in guiding his or her interactions during clinical experiences.

Sarah, a first time ACI who had only been Certified as an athletic trainer for two years gave this example of how her confidence level affected her ability as an ACI. Sarah stated:

> At this point in my career, the recall for specific things is very limited and my explanations are not as good as they should be. I want to become more comfortable with my knowledge base so that I can ask random questions and feel comfortable knowing that I know the right answer. Right now, with the questions I ask, I know the right answer but am I still doubting myself" (Sarah, SR3).

War Horse, a second year ACI who had been certified as an athletic trainer for six years, talked about the importance of proving oneself in new situations. During stimulated recall interview two, War Horse gave this

example of how his confidence level affected the learning relationship he was building with the students. War Horse stated:

> I have a hard time standing back and letting the students do things. People need to see that you know what you are doing and that you know what you are talking about. If they don't think you know your stuff, then they won't come to you or ask you questions. At some point, once you realize that they have confidence in you, then you can transition so that the learning for the student can take place" (War Horse, SR2).

Both Sarah and War Horse were observed providing direct patient care more often than they were observed facilitating student development of direct patient care skills and knowledge. In doing so, the learning relationship with the student was weakened because ATS-ACI interactions were decreased and passive student involvement was supported. In contrast, increased ACI level of confidence was found to increase ACI-ATS interactions.

In Maggie's third stimulated recall interview, Maggie was asked to share his perspective on how he balanced his role as a service provider with his role as an athletic training educator. In his response, Maggie illustrated how confidence guided his interactions during clinical experiences. Maggie stated:

> I have not problem with deciding which injury situations that ATS should handle and which ones I should take over to provide immediate care. I don't

> feel I need to demonstrate that I know what I am doing. I am very comfortable with what I do. I don't need to demonstrate or dominate the clinical experience or take over situations that would be wonderful learning opportunities for the student. If a student is going in the wrong direction when taking care of an athlete, then I can step in. I am very comfortable doing that and doing it in a way that doesn't hurt the student's feelings or discourage them (Maggie, SR3).

ACIs confidence in ATS abilities was also seen as contributing to how the learning relationship developed. All ACIs noted it was important to establish student skills and knowledge base in order to decide the level of interaction the student should have with athletes. For example, during the initial interview, Spirit Wolf shared his philosophy of how he changes his teaching methods as his own confidence in the student's abilities increased. Spirit Wolf stated:

> I have a better understanding as to where the student is at, what their strengths and weaknesses are through working with them through the length of the semester. I actually find myself doing more modeling early in the semester, then progressing to doing things together, and finally, having them do things while I supervise (Spirit Wolf, SR3).

Maggie, a veteran clinical instructor with over 30 years of experience, was observed consistently providing feedback and creating opportunities for students that helped the student gain confidence. Maggie explained the reasoning for his approach during stimulated recall

interview two. Maggie stated, "Confidence may be one of the top two or three critical life skills. I think if you are confident, you can do anything" (Maggie, SR2). Emily, a student, confirmed that Sam, her ACI was instrumental in helping her develop self-confidence. Emily stated, "She is trying to show me that I know the test, and yes, I know what I am doing. She helped me realize that I do know something" (Sam, SR2, EMS).

From a student perspective, the level of confidence he or she possessed affected his or her willingness to participate in the clinical experience. For example, Ashley, a second semester junior, said during stimulated recall interview three, "sometimes I think to myself "do I know this" and then I think "yes I do know it" and then I have confidence in what I am saying. It makes me gain confidence and I know that I know so I can do it" (FISCHER, SR3, Ashbar).

Students often looked to their ACI for affirmation, in helping them to develop high levels of confidence. During stimulated recall interview two, ATS Ashley described how Fischer helped her to develop confidence. Ashley stated, "Sometimes I have to go out on a limb and say "I would do this" and [Fischer] would say "good idea"! (FISCHER, SR2, Ashbar).

ACI and ATS confidence contributed to the development of the learning relationship. ACI confidence in his or her own knowledge and skills as well as ACI confidence in ATS knowledge and skills were identified through data analysis as contributing to the strength of the learning relationship. Data analysis also supported that ATS confidence in his or her own skills and knowledge was important to the development of a strong learning relationship.

Level of Supervision. Level of supervision was defined as the degree of proximity and intensity of supervision during interactions with patients either provided by an ACI or needed by an ATS. Field observations, stimulated recall interviews and research memos all supported that differing levels of supervision occurred. Jaime, a first year ACI and second year ATC, used the term "standing over or standing away" to describe the level of supervision Jaime provided for her students.

Standing over denoted very tight supervision where the ACI actually stood beside the student to observe and listen to the entire interaction. Student autonomy was more restricted when an ACI utilized standing over supervision.

Standing away denoted less restrictive supervision. While the ACI was still in the same room as the ATS, the

ACI was positioned a distance away from the ATS but could still view and hear the interaction. Student autonomy was increased when an ACI utilized standing away supervision. When deciding what type of supervision was appropriate, ACIs appeared to consider the (a) academic level of the student, (b) individual knowledge and skill base the student possessed, (c) student familiarity and prior experience with the specific injury/technique and (d) the severity of the injury.

To illustrate standing over or standing away supervision, Jaime described interactions she had with two of her students. During stimulated recall one, Jaime stated:

> Kelly is doing her senior level fieldwork, and she is dealing with an ankle injury. I don't feel that she needs me over her shoulder saying yes, yes, yes all the time. I don't think she needs that. Cam, on the other hand, I watch more closely. He is a lower level student, a sophomore. He did the evaluation and re-evaluation of an ankle on the same athlete with me standing over him. As the athlete progressed and he did his daily rechecks, I kept my eye on him and let him update me. Once I know he has the knowledge base, I don't feel like I need to stand over him (Jaime, SR1).

Merlin also provided examples of standing over and standing away, though he did not specifically use these terms when he described his reasoning behind stopping an ATS from completing an injury assessment. During field observation three, Merlin was observed taking over the

assessment of an athlete who had a wrist injury. Callie, a junior level student, had started the assessment. Ryan, a sophomore level student, was watching. During stimulated recall three, Merlin was asked why he "chose to do the assessment instead of allowing Callie to continue"? Merlin responded:

> I was doing a follow up evaluation. If Ryan had been doing the evaluation, I would have preferred to do it before Ryan started so I could give [Ryan] an idea of what is going on. Having been with Ryan for a while, I know he is not confident with his assessment skills yet. Sometimes, when I am watching him, even I get confused. If he confuses me, I can't imagine how confusing it must be for him as he is doing it. That is why I jumped in and did the assessment. Mainly I knew Callie knew what was going on and if I let Ryan do it, I would have to do the whole assessment over again anyway (Merlin, SR3).

Several points were illustrated in the response Merlin provided. First, the main concept Merlin described was that a learning relationship existed between he and the students. Second, the level of supervision provided to each student or autonomy permitted by each student was dependant on how familiar and confident Merlin was with the skills and knowledge each student possessed. And third, even though Merlin stated Callie was capable of performing the assessment, he did not allow her to utilize the interaction as a learning experience. Rather, Merlin took over and acted as a service provider instead of using the

interaction in a way that facilitated learning for both Callie and Ryan.

ATS were able to identify which ACIs were more likely to provide tight supervision and which ACIs were more likely to provide more lenient supervision. Sarah and Merlin were identified by ATS as ACIs who preferred to stand away when supervising ATS. During stimulated recall one, Kristin described Sarah as being "more standoffish, like an observer". Kristin further stated:

> Sarah doesn't really get involved, she just watches. It is like she is letting you figure it all out by yourself and then she steps in and will either say something like "are you sure" or "sounds good". I think when she says, "sounds good," it means I am right and when she says, "Are you sure"; I have to change something about my answer (Sarah, SR1, Kristin).

Students were also aware of how closely different ACIs supervised and the intensity of questioning they could expect from each ACI. Jess, a junior level student who was completing her fifth clinical rotation, was able to describe the closeness of Sam's cognitive supervision. In stimulated recall one, Jess stated:

> I know that if I ask Sam a general question, she will ask me more focused questions, focusing my attention on the one thing that will start me on the way to figuring out the answer. She will force me to think through it instead of giving me the answer" (Sam, SR1, Jess).

When the proximity of supervision and level of autonomy permitted by the ACI and student ability levels

were mismatched, students became frustrated by the interaction. Lack of supervision appeared to be as frustrating as over-supervision. For example, Callie described Merlin's supervision style this way. "We are sitting around a lot at practice, twiddling our thumbs. He could be with us, throwing scenarios at us or discussing different topics instead, while we are doing nothing for 3 hours" (Merlin, SR1, callie). And when asked to describe an interaction witnessed between she and Merlin during the first field observation, Callie related her frustration when Merlin over-supervised. Callie stated, "Merlin jumped in and took over. He gets on a roll and follows it and I just have to stand back and watch. He does that a lot" (Merlin, SR1, Callie).

Level of supervision provided by ACIs contributed to the development of the learning relationship. Data analysis identified that ACIs determined the level of supervision needed by ATS based on the situation and ATS skills, knowledge and comfort level. Data analysis also supported that ATS need for differing levels of supervision was important in how the learning relationship between the ACI and ATS developed.

Enthusiasm. The level of enthusiasm demonstrated by ACIs for teaching and by ATS for learning contributed to

how the learning relationship developed. ACI enthusiasm for teaching was defined as the level of commitment toward and enjoyment derived from participating in clinical learning experiences as a clinical instructor. ACI level of enthusiasm was identified through analyzing data collected from ACI initial and stimulated recall interviews, notes and recordings taken during field observations, and ATS stimulated recall interviews.

Dustin, a second semester junior student, related how Maggie's enthusiasm as an ACI affected his clinical experience. In stimulated recall one, Dustin stated:

> Maggie is real active in the student learning and he really cares about making the student understand what needs to be understood. He is one of those ACIs that really tries to get your brain working and gets you to learn (maggie, SR1, Dustin).

And Emily described the learning environment created by Sam this way. During stimulated recall interview two, Emily stated, "Sam gets so excited when I realize that I have done something right. I think she genuinely cares what I think and that I am learning. She makes it exciting and fun" (Sam, SR 2, EMS). Responses provided by Emily and Dustin suggested that when the ACI was enthused about teaching and student learning, the learning environment felt supportive and engaging. The feelings shared by Emily and Dustin were typical of how other ATS

described the learning environment when supervised by ACIs who were perceived as being enthusiastic about teaching.

Ellie, a second semester sophomore, however, described experiences where the ACI did not appear to enjoy his role as an ACI. She talked about how she felt after interacting with War Horse, whose primary method of interacting with students was through directing student actions and providing patient care more often than providing clinical instruction. During stimulated recall interview two, Ellie was asked to reflect on an interaction between she and War Horse that was viewed during field observation two. Ellie stated:

> I felt bad after that interaction, and now, I am going to be reluctant to go back to that ACI again. If I need help or if I need someone to watch me do something, I will go to a different ACI that I know uses more positive feedback" (WH, SR2, Ellie).

However, Emily provided the most spectacular example of an ACI who did not appear committed to teaching nor appeared to derive enjoyment from teaching. In her description of Sarah, Emily talked about Sarah's lack of passion for asking questions and teaching. Emily stated:

> Sarah doesn't really put much of an emphasis on asking questions. She doesn't get passionate at all, except about the athletes she is treating herself. Other than that, she is nonchalant and sometimes, I don't think she really cares that much at all whether she is teaching me anything or not. I don't even think she likes teaching (Sarah, SR2, Emilystr).

ATS enthusiasm toward clinical experiences was defined as the level of eagerness ATS presented when participating in clinical experiences. ATS enthusiasm was identified through comparing data from field observations with data collected from ATS stimulated recall interviews. Member checking was utilized to further clarify ATS level of enthusiasm toward clinical experiences.

Data analysis supported that all ATS were enthusiastic about his or her clinical experiences. However, different ATS showed greater levels of enthusiasm depending on which aspect of clinical experiences were being discussed. Junior student Ashley appeared to favor scenarios, simulations and problem-solving aspects of the clinical experience. During stimulated recall three, Ashley stated:

> I like figuring things out. It's not the same as when you are in the classroom, hearing a lecture or reading about it in a book. It's like problem solving, figuring out what is wrong and how to fix it. I like that aspect of it. Its fun figuring things out and it is better getting to think for myself instead of someone telling me what I should be thinking (Fischer, SR 3, Ashbar).

Cam, a sophomore level student, also appeared to enjoy the opportunity for conceptualization, reflection and application of knowledge that clinical experiences provided. When asked to describe the learning atmosphere of his clinical experience, Cam replied:

> It is extremely positive. Jaime is letting me get used to doing things by myself, formulating my own ideas based on the knowledge that I have, with her watching me. I see something at practice; I go home and research it, and then Jaime and I talk about it the next day. Jaime puts together informational packets for us and we talk about that stuff too. This has been a really great experience (Jaime, SR1, Cam).

In contrast, sophomore student Carolyn appeared to prefer being told or shown the solution. When Carolyn was asked to describe what teaching methods worked best with her learning style, Carolyn responded, "I learn best hands-on like in labs and being shown what to do rather than reading it from a book" (War Horse, SR 2, Carolyn). When asked what aspect of the clinical experience Carolyn found to be most beneficial, her response again supported a preference for being directed or shown what to do. Carolyn stated:

> Sometimes War Horse makes me think through things, which is fine, but I'd rather he just tell me what he thinks. I figure he is telling me to do something because that is what he wants done. He just offers his opinion and shows me different techniques or options that I would have never thought about. That helps me a lot (WH, SR2, CB).

And Ryan, also a second semester sophomore, described a preference for observation. Ryan stated:

> I like the way Merlin is not very controlling and not tight. I usually don't have the initiative to do stuff right away, but I watch. When I do an evaluation, he let's me go with it and then put his two cents in. He says, "You got to do it this way" when you are wrong, then he shows me the right way. He forms his opinion

and then gives me his opinion when I am done" (Merlin, SR 3, Ryan).

Within Theme Two: Creating and nurturing learning relationships to establish enriching clinical experiences explored the behaviors contributing to development of learning relationships. The level of awareness, confidence, supervision and enthusiasm possessed and/or needed by both the ACI and ATS contributed the type of learning relationship that developed between the ACI and ATS during clinical experiences.

Theme 3: Athletic Training Student: active or passive participation

Results presented within Theme Three provide insight onto factors that motivated the ATS to participate in the experience once in the clinical setting. Active participation was defined as ATS self-initiated interactions with patients and ACIs for the purpose of increasing and enhancing ATS knowledge and skill base. Passive participation was defined as ATS reluctance to participate or interact with patients and ACI for the purpose of increasing and enhancing ATS knowledge and skill base. ATS participation was determined through analyzing data collected during field observations and ATS stimulated recall interviews. As depicted in Figure 3 (End of Chapter

4), three main catalysts for student participation were identified: (a) Contextual cues, (b) ACI interactions, and (c) ATS self-perceived level of clinical competence.

Contextual Cues. Contextual cues were defined as information presented within a given interaction during clinical experiences that prompted either a "need to know" drive within the student; or enabled the student to solidify the connection between theory and practice in a way that the student was not able to recognize through conceptualization alone.

Students often used the term "experience" to describe the contextual cues presented during clinical experiences. Excerpts taken from ATS stimulated recall interviews illustrated how needing to know motivated the student to participate in clinical experiences, and were representative of how ATS described contextual cues.

During stimulated recall interview one, Lisa, a sophomore level student in her first full-length clinical rotation, was played an audio recording of an interaction between she, her ACI Fischer and an athlete. In the recording, Fischer and Lisa were jointly evaluating the injured athlete. Lisa was then asked during the stimulated recall session to reflect on what she learned from the interaction. Lisa stated:

> I don't know. I think I knew about [that injury] before, from reading about it. I think I learned about [that injury] on a different level from having a real experience with [that injury]. It is different when you just learn about it from a book or through an injury scenario, but to actually know how it happened, who it happened too; to see the signs and figure out the symptoms, it is real because it is something that I needed to know because it was happening to my athlete (Fischer, SR1, Lisa).

Jess, a junior level student with more clinical experience than Lisa, described how repeated experiences increased her depth of understanding. During stimulated recall interview one, Jess stated:

> If it is an ankle and it is something that I have had already, that helps. Also, the more experience I have with that type of injury, and I see it again and again, but maybe each time it presents a little differently, I begin to learn how a person in that situation responds (Maggie, SR1, Jess).

Both Lisa and Jess described how having an experience with a real injury enriched her understanding of that specific injury. Both ATS also demonstrated an understanding that experience created opportunity to increase knowledge and skill base. The "need to know" drive was fostered and motivated the student to continue actively accumulating additional experiences.

The third excerpt presented was taken from a stimulated recall interview with Ashley, a transfer student who was participating in her fourth clinical experience. During field observation two, Ashley was observed

evaluating an athlete who had sustained injury to his foot. During the stimulated recall interview, Ashley was asked to reflect on her interaction. Ashley stated:

> When we learn about injuries, we learn that this is the MOI, and these are the signs and symptoms. But then a guy comes in and tells you "I've got pain on the top of my foot". It makes you think differently, just how different injuries present themselves differently. Not every person is going to have pain in the same spot. It wasn't your typical inversion ankle sprain. You have to take in a lot of factors and say what does it all mean? This athlete trusted me to tell him what wrong with him and trusting that I was going to help make him better! It's a little scary but I felt really good when Fischer agreed with everything I said and how I handled it. (FISCHER, SR2, ashbar)

In her response, Ashley related how experience made theory real. The contextual cues provided by the athlete were specific to this athlete and may or may not have exactly resembled the textbook injury description. The excitement with which Ashley related her experience suggested an eagerness to stay actively involved in clinical experiences.

Data analysis supported that self-initiated ATS interactions with patients and ACIs for the purpose of increasing and enhancing ATS knowledge and skill base were stimulated by the presence of contextual cues in clinical experiences. No examples of contextual cues decreasing student participation during clinical experiences were found. Even in clinical experiences where ATS perceived a

lack of contextual cues, when contextual cues were presented, ATS participation increased.

ACI Interaction. ACI interactions were defined as how ACIs utilized events occurring within the clinical experience to motivate ATS participation in clinical experiences. ACI interaction as a catalyst for motivating student participation was identified through analyses of data collected from field observations, ATS/ACI stimulated recall interviews and ACI initial interviews. Member checking occurred to further clarify findings.

Data analysis identified that ACIs who supported active ATS participation were ACIs who were able to recognize and utilize teachable moments and contextual cues and who were present during clinical experiences. Fischer, Jaime, Maggie, Sam and Spirit Wolf were identified as ACIs who recognized and utilized teachable moments and contextual clues during clinical experiences. Two excerpts taken from ATS stimulated recall interviews were representative of how ATS described the relationship between active ATS involvement and interactions with his or her ACI.

During stimulated recall interview one, Dustin, a junior level ATS, was asked to describe a typical interaction between he and his ACI, Maggie. Dustin stated:

> Maggie has been the first ACI that I have interacted with this much. Last semester, my ACI was around sometimes, but he had a lot of other stuff going on, so he wasn't around that much. But Maggie takes us out of the gymnastics room into the hallway and quizzes us on everything! He will pick random topics and ask us questions and try to get us to recall things or figure out things. Sometimes he gives us scenarios and makes us problem-solve our way through to get the answers. This is the first time I have had this type of experience with an ACI. So far, I really like it because it keeps me more active in thinking as opposed to previous ACI's who were more focused in taking care of the athletes. We would get the team ready, discuss what we needed to about the team, and then we'd go sit at practice and talk about other stuff. You know, not athletic training stuff, but maybe sports or stuff like that (Maggie, SR1, Dustin).

The response Dustin provided illustrated two points. First, opportunities for ACI/ATS interactions were decreased when ACIs were not present during the clinical experience. Second, when ACIs were present during clinical experiences, ACIs use of student centered teaching skills supported active ATS participation, while ACIs use of instructor centered teaching skills supported passive ATS participation.

The second example provided was taken from a stimulated recall session with ATS Emily. During field observation one, Emily was observed evaluating an athlete who had sustained injury to his knee. ACI Spirit Wolf was observed sitting nearby, watching Emily perform the evaluation. During the stimulated recall session, Emily was

played a recording of her interaction with the athlete and Spirit Wolf and was then asked to reflect on the teaching style Spirit Wolf used during the interaction. Emily stated:

> He came up and just sat on the table, watching me. I like that because he is watching what I am doing, watching how I interact with the athlete. He is letting me get comfortable and he is letting me do the evaluation. After a few minutes, he will start asking me questions, like "why did you do this" or will ask me questions that help me clarify what I am doing, or thinking. He doesn't take over and do it for me. It is more like we are two athletic trainers discussing the findings. He asks me questions about what I have found or what I have done. He has a way of asking just the right question that acts as a trigger for me, like the question we just heard him ask [referring to audio recording of interaction], it triggered for me the thought: oh, right because the athlete had pain right there and because of the athlete's sport, I needed to ask the athlete this line of questioning to rule out a certain type of injury (Spirit Wolf, SR 1, Emilystr).

In her response, Emily highlighted the importance of being allowed to actively process the information through active participation in the evaluation process. Because Spirit Wolf utilized contextual information provided by Emily to frame his questions, Spirit Wolf reinforced and supported Emily's active participation in the clinical experience.

Analysis of data supported that Fischer, Jaime, Maggie, Sam and Spirit Wolf were able to use teachable moments and contextual cues to stimulate active ATS

involvement. In contrast, analysis of data supported that Merlin, Sarah and War Horse did not recognize and utilize teachable moments and contextual cues. ATS supervised by Merlin, Sarah and War Horse described having to initiate his or her own learning experiences to further his or her depth and breadth of understanding athletic training skills and knowledge.

Student Initiated Interaction. Student initiated interactions were defined as interactions occurring between ACI/ATS that the ATS initiated because the ACI did not. Or, when the questions generated by the ATS were more complex and relevant than those posed by the ACI. Student initiated interactions were also considered active student participation but occurred because of ATS frustration with his or current level of interaction with his or her ACI.

ATS Ori illustrated his frustration with the way War Horse supervised when Ori described the role War Horse assumed when facilitating ATS learning during clinical experiences. The response Ori provided was representative of how other ATS described lack of contact or quality of interactions with his or her assigned ACI. Ori stated:

> The major way that I am learning in this clinical assignment is through trail and error. [War Horse] is not over my shoulder a lot, not as much as I would like him to be. He asks a lot of close-ended questions that can be answered with one word or very few words.

> I would like him to ask more open-ended questions; questions that make me question myself; that make me figure out why I would choose one treatment over another one. If he would ask me those types of questions, it would broaden my horizon, broaden my thinking (WH, SR 3, Ori).

The relationship between the inability of the ACI to capitalize on teachable moments and student-initiated interactions was demonstrated through this interaction between an ATS Kristin and her ACI, Sarah.

During Field Observation One, ACI Sarah was observed providing direct patient care while ATS Kristin stood nearby, watching. Sarah saw Kristin, but Sarah made no attempt to engage the student in the interaction. After nine minutes of watching the evaluation, Kristin joined in and began asking the patient questions. At the eleven-minute mark, Sarah began interacting with Kristin. Analysis of data collected during the field observation identified that during the 14-minute interaction, Sarah directed two statements toward Kristin: "Have you felt this before" and "Do you have any other ideas" (Sarah, TS1)?

During the stimulated recall interview with Sarah, Sarah described both a lack of educational purpose in interacting with the student and a need to seek the student's advice. Sarah stated, "I was at the point where I didn't know what to do with this athlete anymore. I wanted

to find out if she [Kristin] had any other ideas. I guess I didn't really have any specific goal in mind" (Sarah, SR1).

During the ATS stimulated recall interview, Kristin was asked to describe (a) what meaning she derived from this specific interaction and (b) if this interaction was an example of a typical interaction she has had with this specific ACI. Kristin responded:

> I was just basically asking [Sarah] questions about [the condition]. I had never seen a Baker's Cyst before so I wanted to know more about it. That's why I went over and started watching and then started asking her questions. She wasn't offering too much information. She doesn't really give too much information about what she is thinking. You have to ask her. She will go into it a little bit but she is never very detailed. I really have to think of questions to ask her or ask the athlete (Sarah, SR1, Kristin).

When providing her response, Kristin's non-verbal communication presented a sense of annoyance with the way Sarah facilitated the interaction. Both in her physical and verbal response, Kristin illustrated a need to actively initiate interactions with her ACI in order to enhance and support her athletic training knowledge and skill base.

Data analysis also suggested that ACIs' contributed to the need for student-initiated interactions to occur when the ACI assumed the ATS understood what was taking place. In the interaction described above between ACI Sarah and ATS Kristin, Kristin actually identified Sarah's

assumptions. During the stimulated recall session, Kristin stated, "My suggestion for Sarah would be not to just assume that we are getting what she is saying. She shouldn't assume we are on the same page" (Sarah, SR1, Kristin).

Other ACIs were identified as assuming ATS understanding was taking place because the student could replicate the skill; therefore the student had an in depth understanding of the underlying theory. Merlin and War Horse were identified through data analysis as ACIs who most often displayed a disposition toward assuming ATS understanding based on ATS skill application.

For example, during stimulated recall three, Merlin was asked how he knew when a student truly understood the supporting concepts of a given technique or approach and why that technique was selected over other techniques. Merlin stated: "I don't always follow up and ask questions. I watch what they are doing and when I see them do the skill right three or four times, than I come to the conclusion that they know why" (Merlin, SR3). In his response, Merlin described modeling as the teaching method he used to facilitate ATS clinical experiences. Merlin was consistently observed during field observations using instructor-centered approaches to teaching.

During stimulated recall interviews, ATS Callie confirmed that most teaching methods selected by Merlin motivated ATS under his supervision to actively seek clarification and greater depth of understand by self-initiating interactions with Merlin, other ACIs, athletes and other ATS. When asked how Merlin helped her to process information on a deeper level, Callie stated:

> Say something happens at practice and we will make a decision on what to do. In the end, Merlin makes the final decision and tells me what we are going to do. Then I say, "okay, so this is going on, this is what we are going to do" and he says "yes". Then I have to take the initiative to ask myself questions, like, "what else could we be doing that we aren't and why aren't we doing that"? "What else could be going on with this athlete and how to I go about ruling that out"? I will be walking around thinking about it, and I will go ask other ATCs or look it up or bring it up in class. Merlin is open to letting me talk about it with him and share my ideas; but in the end we always do what he says. He doesn't really ask me questions about my ideas, but he listens. So, I guess I do it on my own. Unless he is doing something really subtle that I am totally not picking up on, I just have to ask myself those questions that make me think harder about what I am doing in my fieldwork (Merlin, SR 3, Callie).

Student initiated interactions appeared to be driven by the desire of the ATS to learn and the inability of the ACI to utilize teachable moments and select appropriate teaching methods that matched the needs of the ATS.

ATS Self-perceived Clinical Competence. ATS self-perceived clinical competence was defined as the accuracy, efficiency and appropriateness with which students were capable of applying his or her skills and knowledge with real patients during the clinical experience as perceived by the ATS. Few ATS used the term "competence" to describe his or her abilities, but often described differing levels of self-perceived competence during stimulated recall interviews. ATS self-perceived clinical competence was identified through comparing ATS behaviors observed during field observations with comments made by ATS during stimulated recall.

During stimulated recall interviews, ATS were asked to listen to audio recordings of interactions that occurred during the field observations between the ATS, ACI, and athletes. ATS were then asked to describe how he or she felt about actions taken or decisions made he or she made during the interaction. The two excerpts that follow are representative of the different ways ATS self-perceived clinical competence guided ATS to actively or passively participate in clinical experiences.

ATS Jessica was observed during two different field observations, actively engaging patients, peers and instructors during the clinical experience. During

stimulated recall one, Jess demonstrated how increased confidence or a high level of self-perceived clinical competence increased her willingness to actively participate. Jess stated:

> If have the confidence in what I am doing and I think that I am doing the right thing, it is only going to make me want to do more. If I am not confident in what I am doing, I am not going to try to do more. The more confidence I get, the more I am learning because the more I am willing to learn. Where as, if I am not confident, I am not willing to learn. And I won't learn. I will be questioning every thing I do (Jessica)(Sam, SR1, Jess).

Sophomore level ATS Carolyn was observed during three different field observations, consistently waiting for her ACI to provide direction to her. During stimulated recall two, Carolyn was asked to reflect on what appeared to be her passive participation level. In her response, Carolyn argued that her actions were based on performing tasks appropriate for her knowledge and skill base. Carolyn described how her self-perceived clinical competence guided her level of participation toward a more passive role. Carolyn's response also demonstrated a fear of failure and low risk taking tendencies. Carolyn stated:

> There is a lot of stuff that I don't know how to do. I am only a sophomore. I would rather War Horse tell me what his is thinking first so I don't go totally off and be way out there with what I am doing. I don't want to think through things and be wrong. So, I know that when War Horse asks me to do something it is because that is the way he wants it done and it is

> better for me if I just wait until he tells me. That way, I don't do something wrong, the athlete doesn't get hurt, and I learn something (War Horse, SR 2, Carolyn).

The feelings shared by Jessica and Carolyn illustrated several points. First, students who feel confident in their skills and knowledge and perceive themselves as competent are more likely to actively participate in the clinical learning experience. Second, students are less likely to be active if there appears to be a high risk of failure or of making an incorrect response or taking an incorrect action. Third, students use his or her ATC/ACI as a benchmark for what competent looks like.

Analysis of data supported that the willingness of ATS to attempt to collect and consider information presented within a clinical experience and to extract relevant from non-relevant information varied among students. Student self-confidence and self-perceived competence level was one factor when considering willingness of the student to participate in clinical learning experiences. Additional behaviors included the ability or inability of both the ACI and ATS to recognize and utilize contextual cues as catalyst for fostering active processing of information and application of knowledge. Students also demonstrated the need to initiate additional interactions with ACIs, ATS,

and patients if the ACI to whom he or she was assigned did not initiate interactions that fostered active ATS participation.

Conclusion

Data were analyzed through open, axial, and selective coding and coding for process. Three themes were identified through the data analysis process: (1) Approved Clinical Instructors in Athletic Training: promoting problem-solvers or training technicians, (2) Learning relationships in clinical learning experiences, and (3) Athletic Training Student: active or passive participant. Through each theme, a different perspective was presented that helped clarify how the varied elements present within clinical experiences combined to create clinical learning environments.

Clearly, the story was not just about the ACI or the ATS but included the ACI, the ATS and the interactions between the ACI and ATS. Results supported that all ACIs desired for ATS to learn and that all ATS desired to learn during clinical experiences. However, data analysis identified that two very different learning environments were supported: (a) a problem solving learning environment and (b) a technical training learning environment. How the ACI facilitated the experience, the ATS participated in the experience and the relationship that developed between the

ACI and ATS during the experience contributed to the type of learning environment that was fostered. A conceptual map of the factors contributing to the clinical learning environment is presented in Figure 4 (End of Chapter 4).

The way ACIs facilitated the clinical experience varied according to: (a) beliefs and attitudes toward his or her role as an ACI during clinical experiences, (b) teaching strategies, and (c) teaching skills. While ACIs demonstrated a range of beliefs and attitudes, strategies, and skills, two common tendencies toward facilitating clinical experiences were identified: ACI tendency toward promoting problem solving and ACI tendency toward training technicians.

ACIs who displayed a tendency toward assisting students in developing problem-solving skills were ACIs that identified as ACI-athletic training educators; favored student centered teaching strategies and implemented teaching skills that promoted exploration and creativity through discovery and creative learning. Sam and Maggie were identified as ACIs who most strongly demonstrated tendencies toward promoting student problem-solving during clinical experiences.

ACIs who displayed a tendency toward training students to become technicians were ACIs that identified as ACI-

athletic training service providers; favored instructor centered teaching strategies and implemented teaching skills that supported identification and replication of skills and knowledge through memory learning practices. Merlin and War Horse were identified as ACIs who most strongly demonstrated tendencies toward training students to become technicians.

The willingness to actively or passively participate in clinical experiences varied among students. ATS who were identified as actively participating in clinical experiences were those ATS who were able to recognize and utilize contextual cues provided by clinical experiences; were actively engaged by his or her ACI and possessed increased and appropriate self-perceived competence levels. Emily and Jess exemplified ATS who actively participated in clinical experiences.

ATS identified as passively participating in clinical experiences were those ATS who had decreased opportunity or access to contextual cues; few interactions with his or her ACI and/or were not actively engaged by his or her ACI, and who had decreased or inappropriate self-perceived competence levels. Carolyn exemplified ATS who passively participated in clinical experiences. Additional factors included the ability of the ACIs to recognize and translate

contextual cues as catalyst for teaching, and ability of ACI to provide appropriate frequency and intensity of clinical supervision/instruction.

Learning relationship was defined as interactions between ATS and ACI during clinical experiences that contributed to ATS acquisition, retention and advancement of athletic training skills and knowledge. Differing levels of ACI and ATS awareness, confidence, supervision and enthusiasm appeared to contribute to the strength of the learning relationship. As awareness, confidence, supervision and enthusiasm levels increased, the learning relationship was strengthened. Decreased levels of awareness, confidence, supervision and enthusiasm weakened the learning relationship.

How the ACI facilitated the experience, the ATS participated in the experience and the relationship that developed between the ACI and ATS during the experience contributed to the type of learning environment that was fostered. Problem-solving learning environments appeared to be fostered when the clinical experience was facilitated when ACI tendency toward promoting problem solving was high, the ATS actively participated in the clinical experience and the learning relationship between the ACI and ATS was strong. Clinical experiences that were

facilitated by ACI who had tendencies toward training technicians, with passive ATS participation and weak ACI/ATS learning relationships fostered technical training learning environments.

Table 1

Participant Demographics

	Mean	Median	Mode	Number
ACI Years of Experience as an Certified Athletic Trainer	11	7.5	2	8
ACI Years of Experience as a Clinical Instructor	6	.5	0	8
ACI Years of Experience as an Approved Clinical Instructor	2.25	1.5	0	8
ACI holding faculty status	n/a	n/a	n/a	3
ACI holding graduate student status	n/a	n/a	n/a	5
ACI holding education degree/certification	n/a	n/a	n/a	2
ACI pursuing doctoral degrees	n/a	n/a	n/a	2
ACI pursuing master degrees	n/a	n/a	n/a	4
ACI holding dual professional certifications				
ATC/PT				2
ATC/CSCS				1
ATC/EMT				1
ATC/LMT				1
Male ACI				4
Female ACI				4
ATS				
Sophomore Level				6
Junior Level				17
Senior Level				01
Male				04
Female				20

Table 2

Data Sources

Source	Number	Subject	Conducted
Initial Interview	8	ACI	14 days prior to observation
Field Observation	23	ACI/ATS	Between 3-6pm M-F over 39 days
Field Notes	23	ACI/ATS/Setting	Between 3-6pm M-F over 39 days
Audio Recordings Of Field Observations	23	ACI/ATS	Between 3-6pm M-F over 39 days
Stimulated Recall Interviews	23	ACI	Within 24 hours of observation
Stimulated Recall Interviews	31	ATS	Within 24 hours of observation

Table 3

Cognitive Classification of Questions Posed by ACI*

ACI	Total Questions	%Low-level[a]	%High-level[b]	%Other questions[c]
Sarah	26	69.23%	11.53%	19.23%
Merlin	52	88.46%	0%	11.53%
War Horse	71	64.78%	15.49%	19.71%
Jaime**	20	40%	45%	15%
Spirit Wolf	117	70%	05.12%	24.78%
F102	90	60%	25.55%	14.44%
Sam	111	78.37%	12.61%	9.00%
Maggie	225	71.11%	24.44%	4.44%
Group Totals	712	501/712(70%)	121/712(17%)	90/712(13%)

*Sellappah et al (1998) adaptation of Craig and Page (1981) Question Classification Framework
**Jaime was observed twice while all other participants were observed three times.
a) Information, knowledge, application and comprehension
b) Analysis, synthesis, and evaluation
c) Yes/No, Rhetorical

Figure 1. Clinical Facilitation Tendencies of ACIs. ACIs who identify as ACI educators, tend to promote the development of student problem-solving skills through developing student centered teaching strategies and utilization of teaching skills that support student exploration and creation of athletic training skills and knowledge. ACIs who identify as ACI service providers, tend to promote student development of technical skills through developing instructor centered teaching strategies and utilizing teaching skills that support student identification and replication of athletic training skills and knowledge.

Clinical Facilitation Tendencies of ACIs

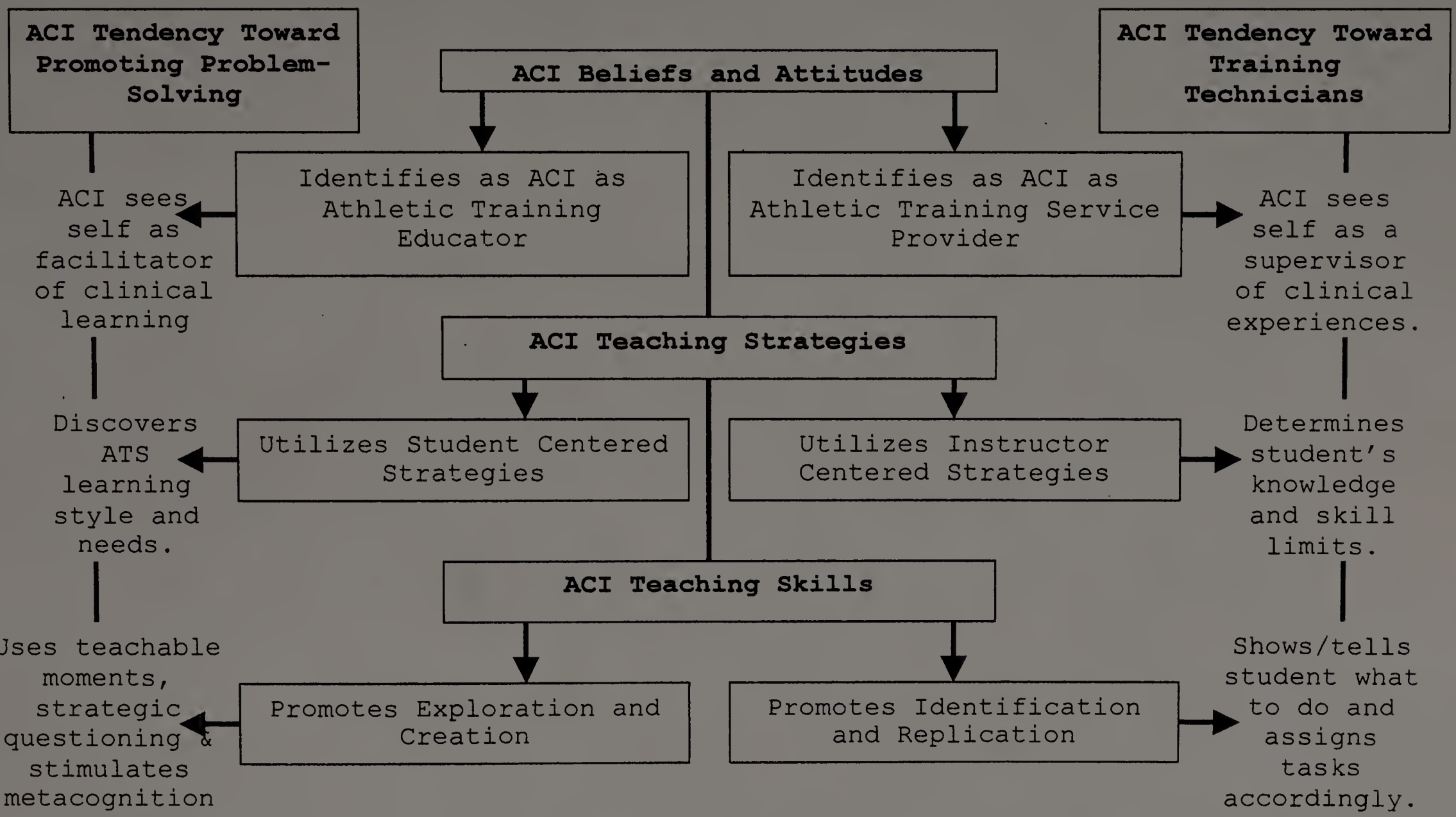


Figure 2. Development of learning relationship between ACI and ATS during clinical experiences. The strength of the learning relationship related to increase or decreased ACI/ATS levels of awareness, confidence, supervision and enthusiasm.

Development of Learning Relationships Between ACI and ATS During Clinical Experiences

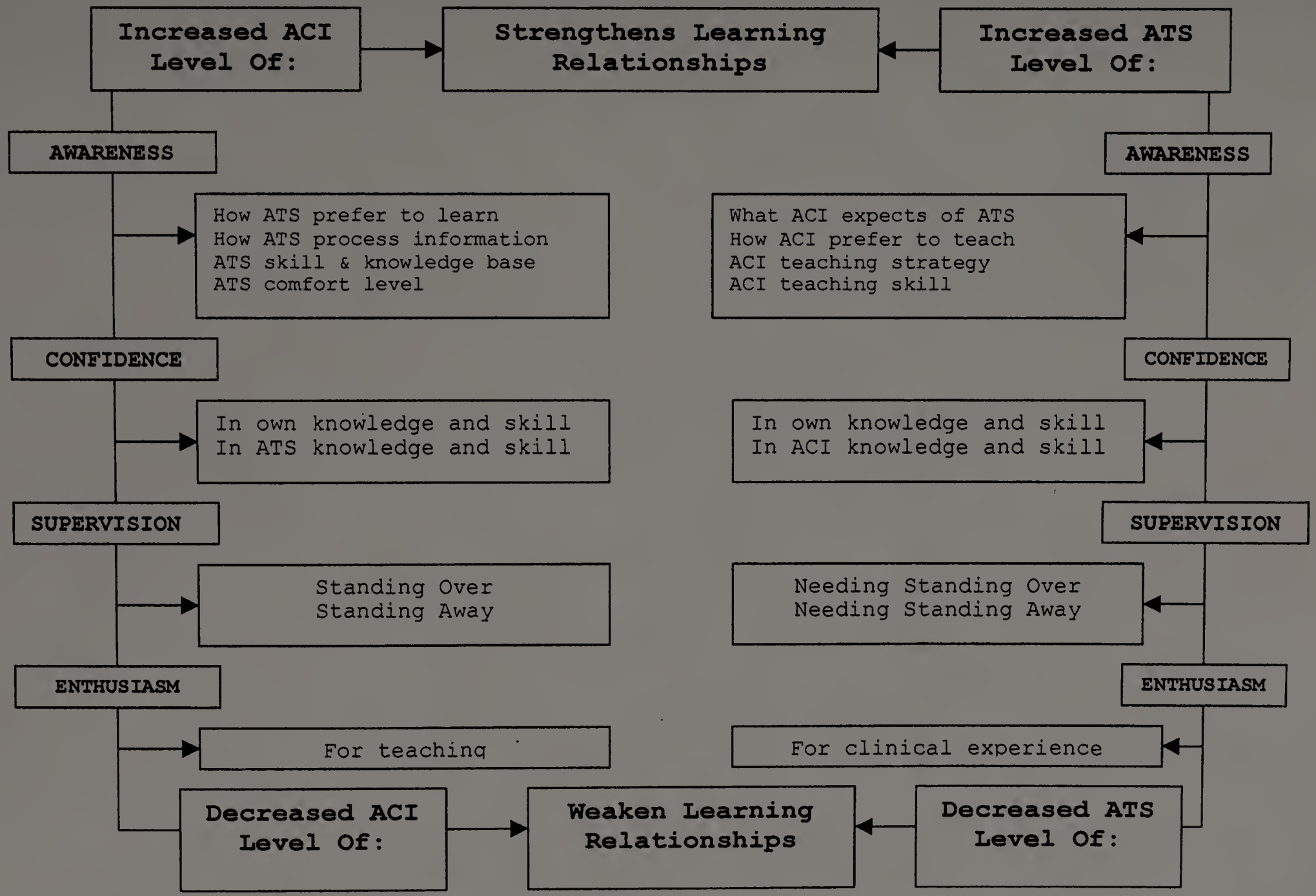


Figure 3. Factors related to active or passive ATS participation during clinical experiences. ATS ability or inability to recognize and utilize contextual cues, ATS interaction with ACI and ATS self-perceived self-competence as related to active or passive ATS participation in clinical experiences.

FACTORS RELATED TO ACTIVE OR PASSIVE PARTICIPATION BY ATS DURING CLINICAL EXPERIENCES

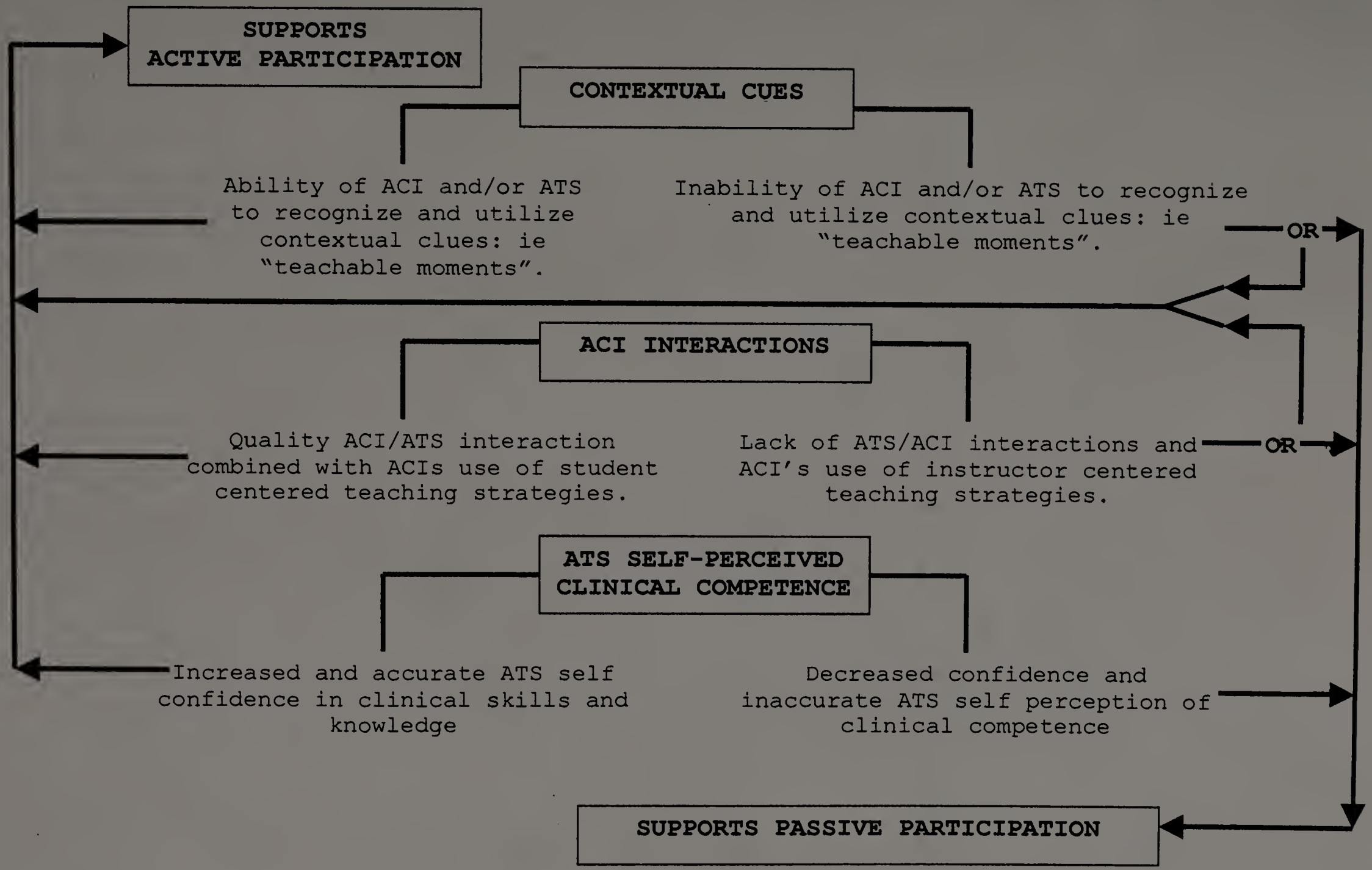
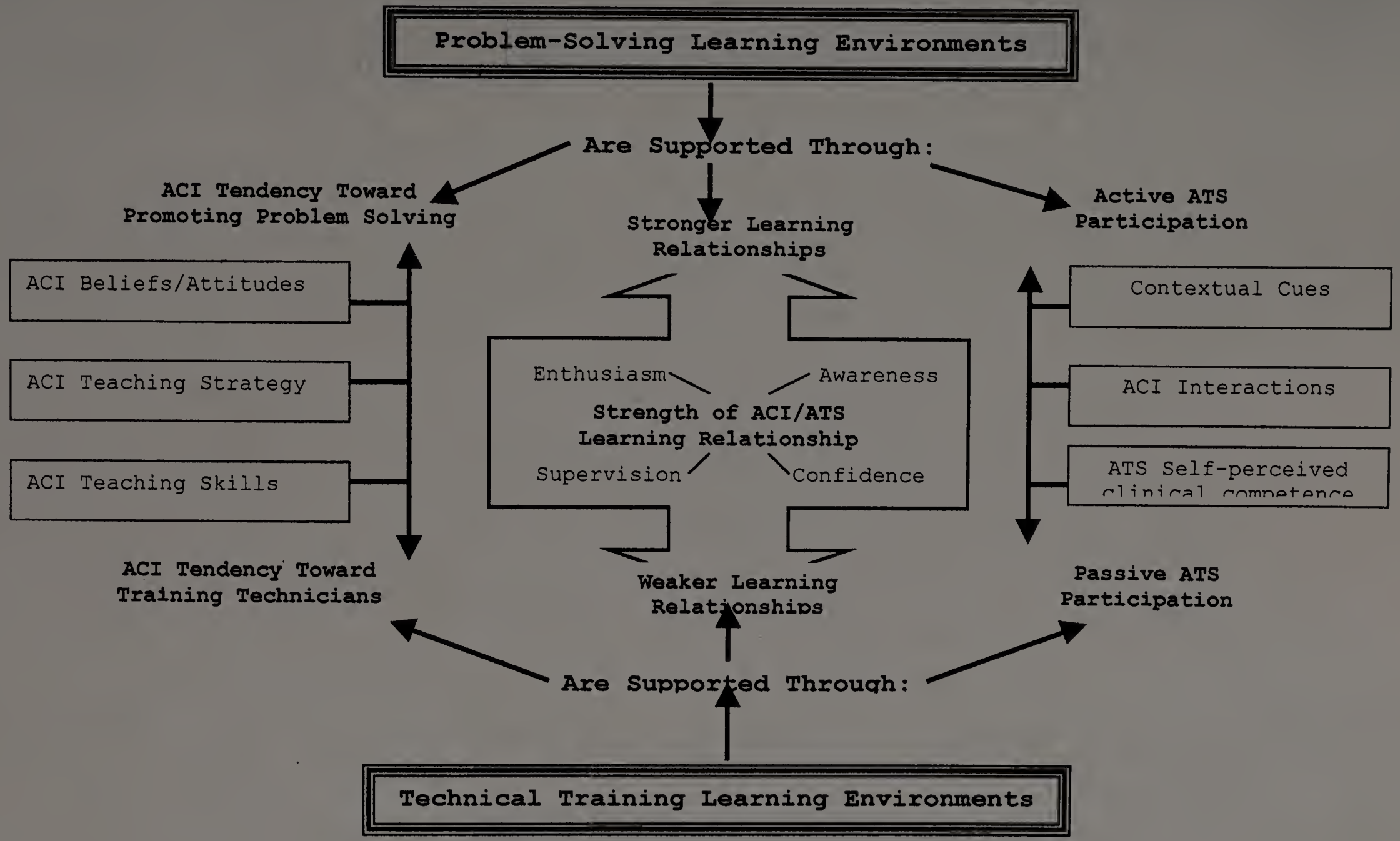


Figure 4. Conceptual Map: Factors Contributing to the Development of Clinical Learning Environments. Problem solving learning environments are supported when the clinical experience is facilitated by ACIs who have a tendency toward promoting problem solving, when stronger ACI/ATS learning relationships exist and when ATS actively participate in experience. Technical training learning environments are supported when facilitated by ACIs who have a tendency toward training technicians, when weaker ACI/ATS learning relationships exist and when ATS passively participate in the experience.

Conceptual Map: Factors Contributing to the Development of Clinical Learning Environments



CHAPTER 5

DISCUSSION

Discussion

The current investigation was designed to identify instructional strategies used by approved clinical instructors (ACIs) in athletic training education programs (ATEP) during clinical experiences. The intent of the researcher was to determine if and how ACIs used questioning to assist students in processing information at increasingly complex cognition levels. ACIs were observed and recorded interacting with athletic training students (ATS) during clinical experiences. Stimulated recall interviews were conducted with ACIs and ATS to assist the researcher in discovering ACIs' instructional strategies and how ACIs implemented instructional strategies during clinical experiences.

Three themes were identified through the data analysis process: (1) Approved Clinical Instructors in Athletic Training: promoting problem-solvers or training technicians, (2) Learning relationships in clinical learning experiences, and (3) Athletic Training Students: active or passive participants. Through each theme, a different perspective was identified that helped to clarify how the varied elements present within clinical experiences

combined to create clinical learning environments. While ACIs' use of questioning was the entry point for exploring ACIs' use of instructional strategies during clinical experiences, data supported that clearly, the story was not just about the instructional strategies ACIs possessed or how the strategies were implemented. The story included the ACI, the ATS and the relationship between the ACI and ATS during clinical experiences.

How the ACI facilitated the experience, how the ATS participated in the experience and the relationship that developed between the ACI and ATS during the experience contributed to the type of learning environment that was fostered. Data analysis identified that two very different learning environments were supported: (a) a problem-solving learning environment and (b) a technical-training learning environment. The discussion is focused on how the two different learning environments were fostered and is organized into the following subsections: (a) ACIs' tendencies, (b) ATS participation and (c) Learning relationships. Conclusions and recommendations are presented in the final two sections of chapter five.

ACI Tendencies

ACIs were identified as having tendency either toward promoting student development of problem-solving skills or

training students to develop technical skills. Findings from the current study suggest that ACIs' beliefs and attitudes, teaching strategies and teaching skills relate to how the ACI tended to facilitate interactions with ATS during clinical experiences. The selection and implementation of teaching strategies and teaching skills, however, appeared to be significantly influenced first, by ACIs beliefs and attitudes.

ACI Beliefs and Attitudes

As has been noted by Good (1987), teachers' beliefs about teaching, subject matter, individual students and students in general influence teaching abilities. Because teachers' beliefs influence how subject matter is presented, how expectations are conveyed and evaluated, and how interactions with students occur, teachers' beliefs affect the overall learning environment and how students learn (Good, 1987). In the current study, ACIs who held beliefs and attitudes associated with ACI as athletic training educator tended to see his or her self as a facilitator of learning and were strongly committed to helping students become professional and skilled problem-solvers. ACIs who held beliefs and attitudes associated with ACI as athletic training service providers tended to see their role educationally as that of clinical

supervisor. ACI service providers were committed to helping students become skilled technicians and viewed clinical experiences as valuable opportunities for students to learn through watching and doing.

A relationship between ACI beliefs and attitudes and ACI teaching strategies and skills was identified through data analysis. Though no causality was identified, ACIs who held beliefs and attitudes associated with ACI as educator were seen to utilize student centered teaching strategies and skills while ACIs who held beliefs and attitudes associated with ACI as service provider tended to utilize instructor centered teaching strategies and skills.

ACI Teaching Strategies

As suggested by Good (1987), instructor teaching abilities are related to teachers' beliefs. Teaching abilities include performance expectations, nature of assignments, the pace of the experience and interactions within the experience as well as the instructor's overall teaching style (Good, 1987). Within the current study, ACIs who were identified as ACI educators tended to demonstrate teaching strategies that were student-centered and based on the needs, abilities, and potential of the student. Strategic questioning, metacognition, simulations and demonstration were identified as teaching skills

implemented in support of student centered teaching strategies.

ACI service providers tended to demonstrate teaching strategies that were instructor centered and were based on patient and instructor needs and abilities. Non-strategic questioning, summarizing, directing and modeling were identified as teaching skills implemented in support of instructor centered teaching strategies. Benner (1984), Clark and Harrelson (2003), and Guyer (2003) advocate the need for adapting teaching strategies and skills to support and match student advancement through the novice-expert paradigm in order to challenge the student to utilize increasingly higher-level cognitive processing abilities.

ACI Teaching Skills

Based on the findings of the current study, ACIs implement teaching strategies and skills that support student exploration and creativity or teaching strategies and skills that support identification and replication. Teaching strategies and skills that support exploration and creativity create learning environments that foster critical thinking and problem solving (Baker, 1996; Colucciello, 1999; Davies, 1999; Heinrichs, 2002; Leaver-Dunn et al., 2002; Mosston & Ashworth, 2002; Orlich, Harder, & Callahan et al., 1990).

The exploration process involves active learning and the recognition of knowledge previously unknown to the learner (Mosston & Ashworth, 2002). Learners begin to make connections between previously stored knowledge and newly acquired knowledge, gaining the ability to use abstract concepts to comprehend and understand current context (Mosston & Ashworth, 2002; Orlich, Harder, & Callahan et al., 1990). Thinking that elicits novel responses, solutions or alternatives, demonstrates creative thinking (Mosston & Ashworth, 2002). To activate creative and discovery thinking processes, Orlich et al (1990) recommends using teaching methods that target analysis of a given situation, synthesis of concepts or evaluation of content. In the current study, ACIs who use strategic questioning, metacognition, demonstrations, simulations and teachable moments supported student exploration and creativity.

The majority of questions posed by ACIs as a group, were classified as information, knowledge, comprehension and application cognition level questions. The current findings are consistent with those reported by Craig and Page (1981), Phillips and Duke (2001), Sellappah et al (1998) and Wink (1993) on the cognition level of questions

posed by clinical nursing instructors during clinical debriefs.

The ACIs questioning ability appears to be more important in contributing to the overall learning environment and in stimulating the cognitive processing of information than is the ACIs ability to ask cognition specific questions. The idea that the way questions are asked may be more important in promoting student understanding than is the cognition level of the question posed is supported by Brophy and Good (1986) and Good (1987).

Appropriate sequencing of questions allows the instructor and student to focus on fundamental aspects of the presented content first. Guided by student response and complexity of content, instructors are then able to expand the conversation through strategic questioning to engage students in stimulating discussion (Good, 1987). Strategic questioning as described in the current study is similar to Wilen's (1986) concept of effective questioning. Wilen (1986) posited that effective questioning occurs only through thoughtful planning and a clearly conceptualized questioning strategy that allows the instructor to vary the complexity of questions to stimulate processing of information at multiple levels.

Phillips and Duke, (2001) and Schweer (1968) support the use of strategic questioning as a method for fostering critical thinking during clinical experiences. Guyer (2003) recommends increasing the complexity level of questions posed by instructors as student content and experience base expands. Strategically transitioning from low to high-level cognitive questions moves the learner through what Clark and Harrelson (2003) call the stages of remembering and using, to a concept that Benner and Wrubel (1984) call perceptual awareness.

ACIs using strategic questioning also change their questioning style to meet the individual needs of the student and the situation. Within the current study, findings support that ACIs using strategic questioning primarily use the Socratic and Funneling methods of questioning. The Socratic style of questioning stimulates the learner to examine, analyze and evaluate information through complex higher-ordered cognitive and affective processing skills (Bloom, 1956; Clegg, 1987; Cunningham, 1987; Teloh, 1986; Walker, 2003).

Research conducted by Borton (1970), Mosston and Ashworth (2002) and Priest and Gass (1997) support the use of the Funneling style of questioning to stimulate the thinking processes of memory, then of discovery and finally

creativity. Whereas Socratic questioning methods involve responding to questions with more questions, funneling seeks to assist the student in processing information in a very specific sequence (Priest & Gass, 1997, Teloh, 1986). Both the Socratic and Funneling methods of questioning are thought to assist the student in developing problem-solving and critical thinking skills (Borton, 1970; Mosston & Ashworth, 2002; Priest & Gass, 1997; Teloh, 1986)).

Findings from the current study differ from the position presented by Sellappah et al (1998) in that how the instructor self-identifies and perceives their primary role within the clinical setting relates to how the instructor utilizes questions. Sellappah et al (1998) reported that no significant relationship existed between the ability of instructors to ask questions that stimulate students to use complex cognitive processing skills and academic qualifications or position held by the instructor. Data presented in the current study suggests that ACIs who hold beliefs and attitudes associated with ACI as an athletic training educator use strategic questioning while ACIs who are identified as ACI as service provider do not use strategic questioning.

While both the current study and the one conducted by Sellappah et al (1998) find that clinical instructors pose

more low-level cognition questions than high-level cognition questions, the current study finds that question cognition level cannot be the total basis for considering how questions are used to assist students in processing information.

The use of strategic questioning as the primary teaching strategy for facilitating learning is supported by Elder and Paul (2003) and Kolb (1984) who see learning as a cycle, driven by asking questions. When clinical instructors use strategic questioning, the student is stimulated to actively pull information from the long-term memory stores and manipulate that information within the working memory (Elder & Paul, 2003). Data collected in the current study highlights that strategic questioning is fundamental to successfully implementing student centered teaching strategies.

Within the current study, ACIs who implemented teaching skills that support exploration and creativity of content were often observed capitalizing on authentic experiences that occurred in the clinical setting. Authentic experiences, or teachable moments, and scenarios provide concrete learning experiences.

Kolb (1984) suggests that learning begins with concrete experiences. ACIs who are skilled strategic

questioners are able to assist the learner in reflecting upon that experience. Drawing from personal observations and feelings about the experience as well from theoretical models, the learner is able to develop new thoughts and implications in the abstract conceptualization mode (Kolb, 1984; Smith & Kolb, 1996). The learner then attempts to test out the new knowledge in the active-experimentation phase of the learning cycle, which gives rise to new concrete experiences (Kolb, 1984; Lewin, 1955; Mcloda, 2003; Mensch & Ennis, 2002). As found in the current study, Mensch and Ennis (2002) also support the use of authentic experiences and scenarios to enhance the learning environment.

Within the current study, ACIs who held beliefs and attitudes associated with ACI as educator use strategic questioning in conjunction with teachable moments to support metacognition. Metacognition is the processing of self-questioning in order to derive relevance (Rosenshine, 1987). Rosenshine (1987) suggests that supporting metacognition is important for assisting students in learning how to formulate self-administered questions in order to break down large blocks of complex information into components that can be processed more easily. When ACIs in the current study were observed using strategic

questioning to prompt student summarization of information, ACIs were actually stimulating metacognition. Metacognition is thought to assists in the development of clinical proficiency (Weidner, Trethewey & August, 1997).

ACIs who were most often observed using teaching skills that supported student exploration and creativity were ACIs who held beliefs and attitudes associated with ACI as athletic training educator. Good (1987) stressed that teacher expectations, based on his or her professional beliefs, are often communicated through his or her choice of teaching methods. ACI-educators in the current study appeared to value critical thinking and problem-solving and tended to possess teaching strategies and implement teaching skills that prompted ATS to use critical thinking and problem-solving skills.

The ability to make context-dependent judgments can only be acquired through exposure to a variety of real-life situations in which the theories and conceptual frameworks acquired in the classroom are challenged, implemented and evaluated (Belenky et al., 1986; Benner, 1984; Dreyfus, 1982). Therefore, teaching strategies and skills that support identification and replication of knowledge and skills tend to support technical training-learning environments. In the current study, ACIs who use non-

strategic questioning, summarizing, modeling, and directing support student identification and replication of skills and knowledge.

Non-strategic questioning was defined as asking questions to stimulate student thought, but without purposefully adapting the timing, sequence or phrasing of questions in order to stimulate any specific cognition skills. ACIS who were most often observed using non-strategic questioning were those ACIs who held beliefs and attitudes associated with ACI as service provider. Data collected through classifying cognition level of questions posed by ACIs supports that ACIs who use non-strategic questioning rarely pose questions that stimulate higher-level cognition skills associated with analysis, synthesis or evaluation.

ACIs using non-strategic questioning appear to pose questions without clear aim as to which cognitive skill the question targets and do not always sequence questions in a way that allows the student to process base information needed to respond to the higher level questions. More often, questions are posed to obtain information relating to patient care and progress. Sellappah et al (1998) termed such questions as informational because the instructor is

seeking base information, and not attempting to stimulate cognitive processing beyond basic recall.

Asking questions that require the students to use lower level cognition skills assists the instructor in establishing the student knowledge base, superficial understanding of content and readiness to learn (Bloom, 1956; Cunningham, 1987, Knowles, 1970, O'Conner, 2001; Orlich et al., 1990). Questions that target low level cognition skills, such as knowledge, comprehension, and application provides opportunity for students to rehearse and review the contents of his or her long-term memory stores (Bloom, 1956; Craig & Page, 1981; Rosenshine, 1987).

In the current study, ACIs who used non-strategic questioning or were novice/advanced beginner strategic questioners ask either primarily low-level cognition questions or do not progressively increase the complexity of questions posed in order to stimulate global consideration of the topic. ACIs using mixed strategic and non-strategic questioning were frequently observed using YES/NO, rhetorical and grilling/drilling questioning styles most often. Good (1987) suggests that overemphasizing declarative knowledge may be counter productive to helping students develop global understanding of a given topic.

ACIs using non-strategic questioning within the

current investigation also rely on clues, cues and hinting questioning styles. Work by Priest and Gass (1997) provide support that both the style of questioning and the cognition level of questions posed by ACIs using non-strategic questions in the current study are appropriate only for level one funneling questions. Level one funneling questions target the "remember" stage of cognition because the learner is trying to recall rather than apply or utilize content (Clark & Harrelson, 2003). Research by Benner (1984), Berliner (1988), Dreyfus and Dreyfus (1996) and Guyer (2003) can be applied in support of using hints, clues and cues and grilling/drilling for novice learners during clinical experiences.

The type of questions utilized in field settings should be appropriate for the academic, experience and cognition level of the student being questioned (Guyer, 2003). Learners appear to progress through five stages of skill-acquisition in the clinical setting: novice, advanced beginner, competent, proficient and expert (Benner, 1982; 1984; Berliner, 1988; Dreyfus & Dreyfus, 1996; Guyer, 2003). In field experiences of nursing students, Benner (1984) suggested that novice student nurses rely heavily on memory thinking processes to access declarative knowledge. As such, novice learner questions should assist the student

recalling declarative knowledge. However, the decision-making skills and skill application abilities of novice learners tend to be limited and rigid (Dreyfus & Dreyfus, 1996). Because the novice has no prior experience, they must fall back on guidelines to govern their actions (Benner, Tanner, & Chelsa, 1996). In the current study, ACIs who use non-strategic questions tend to primarily target declarative and procedural knowledge through his or her questioning methods, without regard for the academic or experience level of the student being questioned.

Procedural knowledge is the ability to store automatic processes for routine action (Sprenger, 1999). The action is primed or influenced by a past experience yet without an awareness of consciously remembering the previous experience (Benner, 1984). Context is needed to move the novice learner beyond knowing what and how, and acquiring the basis of understanding when, why and why not (Benner & Wrubel, 1984). ACIs using non-strategic questioning in the current study rarely pose questions that require students to process information beyond the procedural knowledge level.

Many researchers agree that in order to promote the development of clinical proficiency and critical thinking, the instructor needs to be adept at selecting and using a

variety of questioning styles and teaching strategies to better assist the student in clarifying, identifying and evaluating information gained from experiences (Borton, 1970; Brockhaus et al., 1981; Davies, 1995; Joplin, 1995; Mensch & Ennis, 2002; O'Conner, 2001; Priest & Gass, 1997). Because non-strategic questioning does not incorporate adapting questioning styles or cognition level of questions to meet the individual needs of the learner and context, relies primarily on drilling and grilling, and does not stimulate processing of information beyond declarative and procedure knowledge levels, ACIs using non-strategic questioning in the current study tend to support automatic application of memorized cognitive and psychomotor responses over supporting student development of critical analysis.

ACIs using non-strategic questioning tend incorporate non-strategic questioning in all teaching methods used. ACIs support student identification and replication of skills and knowledge through directing students in what to do and how to do it. Through demonstrating how and when to apply skills and knowledge, and asking students to summarize thoughts for purpose of checking patient status little opportunity for independent thought is provided. Because non-strategic questioning forms the basis of

instructor centered teaching strategies used by ACIs in the current study, students learn how and when to use specific techniques but are not challenged to critically consider alternatives or consequences (Benner, Tanner, & Chelsa, 1996; Benner & Wrubel, 1984; Bloom, 1956; Craig & Page, 1981).

ACIs who use instructor centered teaching strategies and skills support learning through concrete experiences and active experimentation. Because the ACI directs student response or models skill application, little opportunity is provided for students to use abstract-conceptualization or reflective observation (Brockhaus, Woods, & Brockhaus, 1981; Kolb, 1984; Stradley et al., 2002; Wiedner, Trethwey, & August, 1997).

ACIs who were most often observed using teaching skills that supported student identification and replication of skills and knowledge were ACIs who held beliefs and attitudes associated with ACI as service provider. Good (1987) stressed that teacher expectations, based on his or her professional beliefs, are often communicated through his or her choice of teaching methods. ACI service providers in the current study appeared to value technical application and efficiency and tended to possess teaching strategies and implement teaching skills

that prompted ATS to develop technical skill and efficiency.

ATS Participation

ATS demonstrate varying levels of participation during clinical experiences. Active participation occurs when the ATS self-initiates interactions with patients and ACIs for the purpose of increasing and enhancing his or her knowledge and skill base. Passive participation occurs when ATS are reluctant to participate or interact with patients and ACI for the purpose of increasing and enhancing ATS knowledge and skill base.

A students' desire or ability to participate in clinical experiences appears to be related to several different factors. How well students recognize and utilize contextual clues, interactions with ACIs and self-perceived clinical competence influences ATS' decisions to actively or passively participate in clinical learning experiences.

Contextual cues present in the clinical learning environment serve as catalyst for learning. However, unless the student is able to recognize and discern the meaningfulness of the cue, the cue offers the learner no advantage (Winne & Marx, 1987). Within the current study, contextual cues were present in all clinical experiences. ATS no doubt benefit from the concrete experiences

presented by learning in contextually rich work like settings. However, the ability of the ATS to perceive and utilize cues appeared to relate more to how the ACI facilitated the learning experience than to the ATS's ability to use cues.

ACIs who use student centered teaching strategies and skills tend to draw student's attention to contextual cues and utilize contextual cues more often than do ACIs who use instructor centered teaching strategies and skills. ATS appear to model his or her reaction to contextual cues based on the way his or her ACI reacts to contextual cues. As noted by Winne and Marx (1987), student's ability to attend to and derive meaning from either contextual, content or instructor cues will be decreased if the instructor does not have a conscious awareness and plan for assisting students in enhancing cognition.

Interactions between ACIs and ATS are generally controlled by the way the ACI chooses to facilitate the clinical experience (Wiedner et al., 1997; Wiedner & August, 1997). In the current study, the way the ACI facilitates clinical experiences generally tend to support students' critical thinking and problem solving skills or support skills associated with identification and replication of information. Because critical thinking and

problem solving are usually fostered through the use of student centered teaching strategies and skills, students are motivated to become active participants. Conversely, technical training skills are fostered through instructor centered teaching strategies and skills, and students become passive participants. These findings are in agreement with those presented by both Walker (2003) and Leaver-Dunn et al (2002), who suggest that athletic training students cannot develop any innate disposition toward critical thinking if critical thinking is not fostered within their educational experiences. ACIs who cannot adapt his or her style of teaching or questioning to match interests, needs and abilities of the student run the risk of decreasing active student participation (Brophy, 1987).

Findings in the current study reveal a relationship between the desire/ability of a student to become actively engaged during clinical experiences and the ability of an ACI to implement student centered teaching strategies and skills. When ACIs are unable to adapt instructor centered teaching strategies and skills, students who desire to be actively engaged in the learning process take action to either initiate active involvement or become passive participants. Students who prefer passive involvement

remain passive. When ACIs utilize student centered teaching strategies and skills, students who desire to be actively involved remain actively involved. Students who prefer passive involvement are motivated to become actively involved. These findings are again are in agreement with those presented by Brophy (1987), Good (1987) Walker (2003) and Leaver-Dunn et al (2002), who suggest that students cannot develop any innate disposition toward critical thinking if critical thinking is not fostered within their educational experiences and active participation is both the responsibility of the instructor and student.

Learning relationships

Identifying the ability of ACIs to ask questions in isolation or identify ACI teaching strategies alone does not adequately address the influences of the larger clinical environment in promoting the development of student clinical proficiency. Guyer (2003) and Mensch and Ennis (2002) talked extensively about the importance of the clinical environment on learning. As identified in the current study, development of a learning relationship between the ACI and ATS is important in setting the overall affective and cognitive tone of the learning environment. How instructors and students interact during clinical experiences has the potential to either positively or

negatively impact student learning during the experience (Guyer, 2003; Wiedner et al, 1997; Wiedner & August, 1997). Increased or decreased levels of ACI/ATS awareness, confidence, supervision and enthusiasm were evident in contributing to how learning relationships develop.

Learning relationships are strengthened when ACI awareness and understanding increases of how students prefer to learn and process information; of the skill and knowledge base the student possesses and how comfortable students are during clinical experiences. As ATS awareness and understanding increases of how his or her ACI teaches and what is expected, the learning relationship is again strengthened. Good (1987) suggests that instructors exact two types of expectation on students: self-fulfilling and sustaining. Self-fulfilling expectations may influence a change in student performance while student performance is maintained when sustaining expectations are set (Good, 1987). Students tend to re-organize behaviors and performance in order to meet the expectations set by the teacher (Good, 1987).

The level of confidence the ACIs have in his or her own abilities and in the abilities of the student determines the level of autonomy ACIs are willing to allow students during clinical experiences. Some ACIs, such as

War Horse and Sarah, felt the need to "prove themselves" to other ACIs and athletes, and in doing so, took away active learning opportunities from students. Mensch and Ennis (2002) also concluded that creating opportunities to support student autonomy is important because of the strong relationship between autonomy and self-determination. Additional research also supports that an appropriate and progressive increase in student autonomy provides greater opportunity for discovery and creative learning to occur (Mensch & Ennis, 2002; Mosston & Ashworth, 2002; Starkey et al., 2001; Wiedner & Henning, 2002; Wiedner & August, 1997).

A third dimension of the learning relationship is supervision. ATS' perceived need for supervision and the level/intensity of supervision provided by the ACI influenced the strength of the learning relationship. These findings are similar to those reported by Weidner and Pipkin (2002) in a study conducted to examine the quality and level of clinical supervision provided by clinical instructors in athletic training. Weidner and Pipkin (2002) reported that some clinical education experiences in athletic training do not provide athletic training students with appropriate clinical supervision. As in the current

study, experiences that are improperly supervised increase opportunity for inappropriate or unknown learning to occur.

Finally, ATS and ACI level of enthusiasm relates to how strong or weak the learning relationship is. ACIs who demonstrate high levels of enthusiasm toward teaching, create supportive learning environments (Berliner, 1987; Brophy, 1987; Good, 1987). ATS are motivated by desire to please ACIs who appear to care about the student as an individual and are enthusiastic about student academic/clinical progress (Brophy, 1987; Good, 1987).

Conclusion

Findings clearly indicate that the overall learning environment during clinical experiences is significantly important to the way athletic training students gain and apply skills and knowledge during the experience. Problem-solving learning environments are fostered when ACIs' support the student in critically analyzing skills, knowledge, and information gained through the clinical experiences and when strong learning relationships exist between the ACI and ATS. Active ATS participation in the learning process is vital to supporting problem-solving learning environments.

The technical-training learning environment fosters the ATS use of basic cognitive abilities associated with

identification and replication and may be appropriate settings for novice students. Technical-training learning environments are supported when ACIs' display a tendency toward training technicians, when weaker learning relationships exist between the ACI and ATS, and when ATS are passive participants in the learning process.

ATS who desire to actively participate in the clinical experience are motivated to be fully engaged in the experience when paired with ACIs who identify as educators and who value clinical experiences as opportunities to assist students in developing clinical proficiency. When paired with ACIs who identify as service providers and who value clinical experiences as learn-through-doing settings, ATS who desire to actively participate in the clinical experience tend to challenge the ACI or seek additional information/motivation from other ACIs or outside resources. ATS who prefer passive participation in clinical experiences tend to remain passive and are content with replicating ACI behaviors when paired with ACIs who use instructor centered teaching strategies and skills. When paired with ACIs who use student centered teaching strategies and skills, ATS who prefer passivity are motivated to become actively engaged in the learning experience.

If the goal of clinical experiences in athletic training is to support student synthesis of athletic training clinical competencies into broader clinical proficiencies, than the learning environment must assist the student in acquiring and utilizing problem-solving and critical thinking skills in order to achieve clinical proficiency. No longer can the athletic training profession be content with utilizing apprenticeship model learning environments that promote a technicians' perspective toward application of skills and knowledge. Clinical learning environment must assist students in developing critical thinking skills in order to achieve full clinical proficiency.

However, finding adequate numbers of clinical settings that foster problem-solving learning environments may prove to be problematic. The underlying and supporting factor in the problem-solving learning environment is the ACI's ability to use strategic questioning in conjunction with student centered teaching strategies and skills. ACIs use of strategic questioning and student centered teaching strategies appears to be strongly related to the ACI's beliefs and attitudes toward clinical experiences and his or role as an ACI. ACIs that hold beliefs and attitudes of an ACI as educator tend to create learning environments

that support problem solving while ACIs that hold beliefs and attitudes of an ACI as service provider tend to create learning environments that support technical application skills. A shift toward problem-solving learning environments may require a shift in ACI beliefs and attitudes.

Recommendations

If ACIs are to continue to be the primary facilitator of clinical experiences, more needs to be done to prepare the clinical instructor for the role of educator and/or service educator in clinical experiences. Currently, entry-level athletic training education programs expose students to limited public relations and information dissemination strategies but do not require programs to include course content in pedagogy. And while Approved Clinical Instructor Workshops provide clinical instructors with knowledge of the standardized concepts, language, and requirements relating to clinical education, complex and extensive pedagogic information is beyond the scope of these current workshops. Three options are provided to remedy the lack of complex pedagogic knowledge apparent in the current ACI policy: a) addition of specific pedagogic content to the Educational Competencies in Athletic Training, b) addition of an advanced level ACI training workshop requirement that

specifically focuses on enhancing ACI use of strategic questioning during clinical experiences, or c) addition of specific pedagogic content at the Master's level and requiring Master's level or higher degree as a pre-requisite for ACI status.

Clinical coordinators should examine clinical placements from two additional aspects: length of rotation and ACI/ATS pairing. The length of each clinical experience needs to provide adequate time and opportunity to allow for students and instructors to develop meaningful learning relationships. When assigning ATS to ACIs, pairings should be made that stimulate the greatest level of cognitive, psychomotor and affective engagement on the part of the ATS. While student abilities certainly play a role in making that decision, the way ACIs facilitate the learning experience should be of equal importance. Clinical coordinators may want to consider the overall clinical learning environment fostered at each clinical site when considering ATS placements instead of attempting to match individual ACI teaching skills with ATS needs.

Clinical Instructor Educators should consider holding ACI retraining sessions that focus specifically on the use of strategic questioning and student centered teaching strategies and skills.

Further Research

Further research should be conducted to verify if the findings of the current case study are consistent with clinical learning environments found in other clinical sites and how ACIs from different ATEPs use questioning to facilitate ATS learning during clinical experiences. Replicating the current study across several ATEP curriculums by randomly selecting one ACI from each ATEP curriculum for one-time observations would provide a means for comparison of findings.

The current case study also did not involve collecting data during game or practice times. Extending data collection methods to include or focus on questions posed by ACIs during times of low-patient volume may yield different findings. Similar findings may support the need for implementing additional pedagogic content in ATEP or the addition of advanced ACI training courses.

The current study focused on the skills and abilities of the ACI to facilitate clinical learning experiences. As such, repeated observations and interviews were conducted over time with the same ACIs. To test out hypotheses regarding the use of clinical learning environments, ACI tendencies, learning relationships and ATS participation on the development of critical thinking and clinical

reasoning, a longitudinal study should be conducted following not the ACIs but students as they progress through different clinical experiences and interact with different ACIs. Findings would better inform the discussion on determining how to match student-instructor pairings over the entire length of a student's clinical experiences.

Additional research should be conducted on the use of strategic questioning workshops to enhance and improve the ability of ACIs to use strategic questioning. Findings may assist professional athletic training educators in examining the content or structure of current Clinical Instructor Educator (CIE) workshops or support the need for advanced level CIE workshops.

Finally, only clinical instructors who were recognized as ACIs were utilized as participants during this study. Replicating this study using non-approved clinical instructors may yield valuable information for comparing clinical instructors' use of questioning with approved clinical instructors' use of questioning to facilitate learning during clinical experiences.

APPENDIX A

PROGRAM DIRECTOR CONSENT TO GAIN ENTRANCE

Mary G. Barnum
Investigator's Name
Member

Dr. Joseph B. Berger
Responsible Faculty

February 23, 2004

Dear Program Director,

As a doctoral student in the department of Educational Policy, Research and Administration program at the University of Massachusetts at Amherst, I am interested in examining how clinical instructors in athletic training facilitate the acquisition, retention and utilization of athletic training skills and knowledge during the clinical field experiences of athletic training students. The study will involve audiotaping and observing clinical instructors for three 30-minute sessions as they interact with athletic training students during clinical field experiences. If the clinical instructor feels that the information being discussed with the athletic training student, student athlete or others within the facility compromises the patient's privacy rights or in the case of a medical emergency which demands the attention of the clinical instructor, the participant has the flexibility of de-activating the recording device. Clinical instructors and the athletic training students with whom they interacted during the data collection period will then be interviewed regarding the interaction.

I am requesting your permission to allow me to perform my investigation using your facility as the site where data collection is to take place. The name of the institution will not be used in the study nor will you be asked to identify yourself. Please sign this consent form to acknowledge your consent to begin this investigation. Thank you for your participation in this study.

_____ _____

Signature Date
Program Director, Athletic Training Education

APPENDIX B

COORDINATOR OF ATHLETIC TRAINING SERVICES CONSENT TO GAIN ENTRANCE

Mary G. Barnum
Investigator's Name

Dr. Joseph B. Berger
Responsible Faculty Member

February 23, 2004

Dear Coordinator of Athletic Training Services,

As a doctoral student in the department of Educational Policy, Research and Administration program at the University of Massachusetts at Amherst, I am interested in examining how clinical instructors in athletic training facilitate the acquisition, retention and utilization of athletic training skills and knowledge during the clinical field experiences of athletic training students. The study will involve audiotaping and observing clinical instructors for three 30-minute sessions as they interact with athletic training students during clinical field experiences. If the clinical instructor feels that the information being discussed with the athletic training student, student athlete or others within the facility compromises the patient's privacy rights or in the case of a medical emergency which demands the attention of the clinical instructor, the participant has the flexibility of de-activating the recording device. Clinical instructors and the athletic training students with whom they interacted during the data collection period will then be interviewed regarding the interaction.

I am requesting your permission to allow me to perform my investigation using your facility as the site where data collection is to take place. The name of the institution will not be used in the study nor will you be asked to identify yourself. Please sign this consent form to acknowledge your consent to begin this investigation. Thank you for your participation in this study.

_____ _____

Signature Date
Coordinator of Athletic Training Services

APPENDIX C

APPROVED CLINICAL INSTRUCTOR CONSENT

Study of Understanding Clinical Instructional Strategies in Athletic Training Education

Department of Educational Policy, Research and Administration
University of Massachusetts at Amherst
Amherst, MA

Mary G. Barnum
Investigator's Name

Dr. Joseph B. Berger
Responsible Faculty Member

I volunteer to participate in this qualitative study and understand that:

1. I will be interviewed by Mary Barnum during an initial interview that will take place prior to field observations and will use a guided format consisting of eight questions.

2. The questions I will be answering address my use of clinical instructional strategies in facilitating clinical field experiences in athletic training.

3. The interview will be tape recorded to facilitate analysis of data.

4. I will be observed by Mary Barnum during three 30-minute observations over a four to six week period as I interact with athletic training students during clinical field experiences in pre and post-participation activities.

5. My interactions with athletic training students during the observation periods will be tape recorded and observed by Mary Barnum.

6. In the event that the information being shared between myself and the athletic training student or between

myself and others in the setting is of a sensitive nature with regard to athlete care, I may de-activate my personal remote recording device.

7. Within 24 hours of each observation, Mary Barnum will again interview me, following a stimulated recall format using the tape recordings taken of my interactions with athletic training students during the observation period immediately prior to the interview.

8. The interview will be tape recorded to facilitate analysis of data.

9. I will be assigned a code name and my name will not be used, nor will I be identified personally in any way at any time.

10. I may withdrawal from part or all of this study at any time.

11. I have the right to review material prior to the final oral exam or other publication.

12. I understand that the results from this study will be included in Mary Barnum's doctoral dissertation and may also be included in manuscripts submitted to professional journals for publication.

13. I am free to participate or not to participate without prejudice.

14. Because of the small number of participants, approximately eight, I understand that there is some risk I may be identified as a participant in this study.

_____ _____

Researcher's Signature Date

_____ _____

Participant's Signature Date

APPENDIX D

ATS INFORMED CONSENT

Study of Understanding Clinical Instructional Strategies in Athletic Training Education

Department of Educational Policy, Research and Administration
University of Massachusetts at Amherst
Amherst, MA

Mary G. Barnum
Investigator's Name

Dr. Joseph B. Berger
Responsible Faculty Member

I volunteer to participate in this qualitative study and understand that:

1. Mary Barnum will observe my ACI during three 30-minute observations over a four to six week period as my ACI interacts with me during clinical field experiences in pre and post-participation activities.

2. During the observation periods, interactions between my ACI and athletic training students, including myself, will be tape recorded and observed by Mary Barnum.

3. Within 24 hours of each observation, Mary Barnum may interview me. The interview will follow a stimulated recall format using the tape recordings taken of the interactions between my ACI and myself during the observation period immediately prior to the interview.

4. The interview will be tape recorded to facilitate analysis of data.

5. I may withdrawal from part or all of this study at any time.

6. I have the right to review material prior to the final oral exam or other publication.

7. I understand that the results from this study will be included in Mary Barnum's doctoral dissertation and may also be included in manuscripts submitted to professional journals for publication.

8. I am free to participate or not to participate without prejudice.

9. Because of the small number of athletic training students being supervised by my ACI, approximately three, I understand that there is some risk I may be identified as a participant in this study.

_____ _____

Researcher's Signature Date

_____ _____

Participant's Signature Date

APPENDIX E

ACI INITIAL INTERVIEW QUESTIONS

Yrs. Experience as ATC: _____
Yrs. Experience as a CI: _____
Yrs. Experience as ACI: _____

Initial Interview

1. Tell me about your style or approach in facilitating the clinical field experiences of athletic training students.

2. What factors have contributed to the style or approach you have developed when facilitating the clinical field experiences of athletic training students?

3. Describe for me a typical interaction between an athletic training student and yourself during the clinical field experience.

4. When you are working with a team and providing clinical supervision during clinical field experiences, how do you see yourself? What is your role?

5. What specific coursework, workshops or conferences have you attended that focused specifically on or were closely related to pedagogy?

APPENDIX F

CLINICAL INSTRUCTOR OBSERVATION TOOL (CI-OT)

Instructor being observed: _____

Date: _____ Time Started: _____ Time Ended:_____ Total Time: _____

Student Level:

_____Freshman
_____Junior
_____Sophomore
_____Senior

Event:

____Pre-practice
____Post-practice
____Pre-game
____Post-game

____Other

ATS LIST

Code: (Behaviors are coded from perspective of what the ACI is doing)

ACI = ACI being observed aci = other ACIs in the setting

P = patient care
D = directs ATS to provide patient care
S = supervises (discusses treatment, provides feedback, demonstrates) ATS during patient care
O = observes ATS providing direct patient care
U = unaware ATS is providing direct patient care
(+) = 2 or more behaviors occurring at the same time with same patient
(/) = 2 or more behaviors occurring at same time but with different patients

M	ACI Behaviors. Events and Activities. ATS Reactions. ATS/ACI Interaction	Observer Comments:

APPENDIX G

QUESTION CLASSIFICATION FRAMEWORK*

Category	Cognitive Activity Required	Key Concepts	Sample Questions
Information	Describing scene For clinical instructor	Description	"Are you ready"? "Who needs heat"?
Knowledge	Recall	Memory Repetition Description	What, when, who, Define, describe List, show, name
Comprehension	Understanding	Explanation Comparison Illustration	Compare, contrast Explain, conclude Rephrase, example
Application	Solving	Solution Application	Apply, build, Consider, apply
Analysis	Exploration of Reason	Induction Deduction Logical order	Support your view Take apart, why
Synthesis	Creating	Productive Thinking Novelty	Think of a way create a plan why
Evaluation	Judging	Judgment Selection	Choose, defend decide, which
Other	YES/NO Basic recall	Respond	Did you do?
Other	Affective	Feelings	Would you like How do you feel
Other	Rhetorical	no answer expected	
Other	Probes/prompts	Hint, clue, cue	

*Craig and Page (1981) as adapted by Sellappah et al (1998).

Written permission to utilize the Question Classification Framework was obtained from Professor Sellappah at Edith Cowen University in Brisbane, AU.

APPENDIX H

ATS STIMULATED RECALL QUESTIONS

Stimulated Recall Interview

1. Describe for me a typical interaction between [name of clinical instructor] and yourself during your current clinical field experience.

2. Tell me what you were thinking about during this interaction with your clinical instructor.

3. Listen to this segment and then describe for me how your learning was impacted by what your ACI did and/or said.

4. I am going to play the tape and I want you to stop me when your ACI says or does something that you found to be important and meaningful to your learning OR that you found to hinder your learning.
   a. Explain to me why this was helpful to your learning process.
   b. Explain to me how this hindered your learning process.

5. Typically, how do the questions your ACI asks you and how those questions are phrased, sequenced or timed impact your learning of athletic training skills and knowledge during your current clinical field experience?

6. How does what you say or do affect the way your ACI facilitates your learning experience?

7. Compare the interaction I recorded and observed between you and your ACI with the typical interactions you have with your ACI during your current field experience.

8. Please identify for me your academic level, ATRN related coursework you have completed, and a brief assessment of your current level of athletic training skills and knowledge.

APPENDIX I

ACI STIMULATED RECALL INTERVIEW QUESTIONS

1. Tell me what your goal was in asking this set of questions?

2. What information did you utilize in selecting and formulating the questions asked in this sequence?

3. What type of cognitive processing abilities were you trying to stimulate during the following interaction with the athletic training student?

4. Explain for me what you are doing during this segment and why you selected these techniques.

5. How does what the student says or does factor into how you facilitate their learning experience?

APPENDIX J

QUESTION CLASSIFICATION FRAMEWORK GUIDELINES

1. Review the Question Classification Framework to become familiar with the categories and category descriptors. Descriptors include: (a) the type of cognitive processing needed to respond to the question being posed, (b) the over-all concepts that globally describe the cognitive processing abilities needed and (c) sample questions and words that typically are used to target that specific cognitive activity.

2. Utilize the Question Classification Framework (QCF) and QCF Recording Worksheet to identify and record the classification of questions posed by the participants during field observations.

3. **When classifying questions, please consider the following**:
   a. Classify only questions posed by the participant.
   b. Questions that appear to fit into two categories should be classified in the higher-level category.
   c. Consider context and sequencing of question.
   d. On the actual transcription sheet, please highlight the question in the marker color that corresponds with the color indicated on the recording worksheet for that category. (i.e. Purple = analysis)

4. **QCF Recording Worksheet Guidelines:**
   a. Use one recording worksheet for each field observation.
   b. Record the participant's name in the appropriate location on the worksheet. The participant's name can be found in the upper left hand corner of the transcription sheet.
   c. Record the field observation number (FO#) in the appropriate location on the worksheet. The FO# can be found in the upper left hand corner of the transcription sheet.
   d. Record your name on the Rater line.
   e. For each classification, indicate the number of questions posed by the participant for that category by circling the appropriate number located in the third column.
   f. Any question that does not fit into the QCF, please indicate the line number and write out the question on Page 2 of the QCF recording worksheet.
   g. When you have completed classifying the questions posed during that specific field observation, please total # of questions posed, # of questions that you were able to classify and # of questions that did not fit framework. Record totals at the top of the recording worksheet where indicated.

5. When analysis complete, clip the recording sheet and FO transcription sheet together. Place all documents in packet and return to me.

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