Athletic Training Education Journal; 2009;4(1):23-27

www.nataej.org

Questioning and Feedback in Athletic Training Clinical Education

Mary G. Barnum, EdD, ATC, LAT*; M. Susan Guyer, DPE, ATC, LAT*; Linda S. Levy, EdD, ATC †; K. Sean Willeford, MS, ATC, LAT‡; Patrick Sexton, EdD, ATC, ATR§; Greg Gardner, EdD, ATC, LAT¶; A. Louise Fincher, EdD, ATC, LAT#

*Springfield College, Springfield, MA; †Plymouth State University, Plymouth, NH; ‡Texas Christian University, Fort Worth, TX; §Minnesota State University, Mankato, MN; ¶The University of Tulsa, Tulsa, OK; #The University of Texas at Arlington, Arlington, TX

Abstract: The purpose of this article is to provide clinical instructors with information and ideas on how to utilize questioning and feedback during clinical experiences. Definitions, purpose, and examples of different questioning skills are provided. Corrective and directive feedback methods are defined with purposes and examples provided of each.
Key Words: Strategic Questioning, Corrective Feedback, Directive Feedback, Experiential

Learning, Critical Thinking

Questions serve as a catalyst for learning that urge the learner to gain additional knowledge about content, source, associated tasks, problems, quality, interpretation, and implications of the information encountered during clinical and didactic experiences.[1,2] Feedback, however, is information describing students' performance in a given activity that is intended to guide their future performance in a similar or related activity.[3] Questioning and feedback are tools immediately accessible to the clinical instructor during each interaction he or she has with his or her students; therefore, having the potential to dramatically impact the learning environment.[4] The purposes of this paper are as follows: 1) to describe strategic questioning and feedback, 2) to provide clinical instructors with examples and strategies for incorporating questioning and feedback into clinical learning experiences, and 3) facilitate critical thinking, develop clinical proficiency and promote positive professional behaviors.

Dr. Barnum is an Assoc. Professor of Exercise Science and Sports Studies and Director of the ATEP at Springfield College
mbarnum@spfldcol.edu

Dr. Guyer is an assoc. professor in the Dept. of Exercise Science and Sports Studies and Clinical Coordinator of the ATEP at Springfield College.
mguyer@spfldcol.edu

Questioning

Asking questions enhances teaching effectiveness and student learning;[5-9] and is central to effectively facilitating experiential learning[10-13] and stimulating critical thinking.[14-19]

When clinical instructors use questioning, specifically strategic questioning,[4] the student is stimulated to actively pull information from the long-term memory stores and reconsider that information within the working memory.[1] Mosston and Ashworth[20] divide the learning/thinking process into three processes: memory, discovery, and creativity.

The memory process involves retrieval of information from the long-term memory for rehearsal in the working memory[20] and is the recall and recitation of declarative knowledge or facts.[20-22] Memory thinking and learning is considered a lower level cognitive processing skill[23] and is important in developing a foundation of base level knowledge.[4,23] Questions that require the student to identify anatomical structures or implement an established protocol, for example, target memory processes.[7,24,25]

The discovery process involves active learning and the recognition of knowledge previously unknown to the learner.[20] 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.[21,26] For example, questions that require the student to apply or discuss a known protocol in a new context or with a new patient population, target discovery-thinking processes.[21,24,27]

Thinking that elicits novel responses demonstrates creative thinking.[21] To activate creative thinking processes, Orlich et al.[27] recommend using questions that target analysis of a given situation, synthesis of concepts or evaluation of content. To move a student through the stages of learning/thinking[21] by requiring the student to

process the information using increasingly complex cognitive process skills, the questions need to be thoughtfully worded and strategically patterned.[28]

Strategic questioning goes beyond asking questions to simply check a student's knowledge base, comprehension level or confirm clarity of instructions, although this is important information to gather and reinforce. Strategic questioning is the conscious adaptation of the timing, sequencing and phrasing of questions in order to facilitate student processing of information at increasingly complex cognitive processing levels.[28] Strategic questioning assists students in developing skills of knowledge exploration and creation, supports discovery and creative learning and ultimately, enhances critical thinking skills.[28]

The sequence in which questions should be asked to make the pattern of questioning strategic is presented in Table 1 and involves three steps or levels. Strategic questioning begins with posing questions that check and reinforce a student's memory thinking and learning skills, or the lower level cognitive processing skills associated with knowledge, comprehension and application.[21,23,28] The instructor should elicit information from the student regarding what the student knows to be true about the topic under discussion and are therefore labeled "what" level questions.[12] In this phase, the instructor is helping the student reinforce prior knowledge and skill, and develop self confidence.[28,29] Globally, the instructor is asking the student to identify the basic foundational knowledge needed to interact on the topic under discussion.[12,23,28] What level questions are important in reassuring both the instructor and the student that the student's knowledge and understanding of the topic is accurate.[28]

Table 1. Sequencing of Questions Using Strategic Questioning Pattern

Type of Question[12]	Purpose	When to use
"What" Questions	To confirm and assess a student's knowledge, skill and understanding of the basic concepts of the topics/skill being discussed.	In initial exposures or in repeated exposure to content in new or complex applications/settings.
"So What" Questions	To assist student in analyzing information, determining relevancy, considering alternative options.	Once general knowledge, skill and understanding have been established; with repeated exposure to same/similar topic.
"Now What" Questions	To provide student opportunity to practice and develop critical thinking skills	When student appears to have mastered content; repeated exposure to same content/skill.

For example, a patient approaches your junior level student with a request for a moist heat pack treatment prior to participating in practice. The instructor observes the student perform the evaluation and agrees with the final assessment. Here are some examples of "what" level questions that might be posed to this student in order to assist them in determining if a moist heat treatment is the appropriate treatment for this patient:

- What are some of the indications for using moist heat packs?
- Identify some of the contraindications for applying moist heat packs.
- Explain to me the therapeutic effect of moist heat pack treatments.
- Describe a standard treatment protocol for moist heat pack application.
- What is our policy regarding moist heat pack treatments?

With this round of questioning, the instructor has required the student to retrieve prior knowledge regarding indications, contraindications, therapeutic effect and treatment policies (memory thinking) and recite that information to the instructor. In doing so, the student is reviewing stored information and reworking it for immediate use. The instructor is checking the student's knowledge base for accuracy and if correctly stated, should provide confirmation, thus supporting the student's self confidence and reinforcing his or her knowledge base.

The next level in strategic questioning is termed the "so what" level[12] of questioning because the instructor is asking the student to break down the information. "So what" level questions help the student sort through the information to determine relevancy and connectivity, apply concepts, see supportive or contradictory perspectives, enumerate choices and analyze options.[4,12,23,29] So what questions require mid to higher level cognitive processing skills and therefore, are more difficult.[23,28] Examples of "so what" level questions to use with the scenario of the junior level student and the moist heat treatment include:

- How do the findings from your evaluation compare with the indications and contraindications for a moist heat pack treatment?
- What are other treatment options for this patient's condition?

With this round of questioning, the instructor requires the student to analyze the clinical scenario and compare it to an acceptable protocol defined in the classroom or laboratory setting. The student uses discovery thinking to recognize the difference between how the information presents conceptually in the text book with real world application in the clinical setting.

The third and final phase in strategic questioning is the "now what"[12] level in which the instructor asks the student for his or her decisions, opinions, and solutions. Now what level questions are the most difficult for the student to respond to because the questions require the student to use the highest level cognitive processing

skills.[23,28,29]

The instructor should select one or two high cognition level questions that will require the student to evaluate, synthesize, and interpret the information or defend his or her thoughts, actions and decisions. Examples of questions the instructor might pose at this point include:

- How do you want to treat this patient?
- Why have you selected this specific method for treating this patient?
- Is this really the most appropriate treatment for this patient at this time?

By following this pattern of questioning, the instructor strategically sequences the questions, first targeting low level cognitive processing skills and then transitions to targeting higher level cognitive processing skills. In doing so, the instructor assists the student in using different types of thinking and learning processes. With the continued use of strategic questioning, the student develops an awareness of the questioning sequence and what the student must do to be prepared to respond at each level of questioning.[28] In doing so, the student develops a system for thinking.[4] The exercises presented in Table 2 can be used to help clinical instructors develop his or her strategic questionings abilities.

Table 2. Strategies for Developing Strategic Questioning Skills

Discover Your Questioning Pattern and Style:

1. Listen to yourself as you interact with your students. The best method for doing this is to audiotape yourself during actual interactions with students (with their permission) or have a colleague listen to the conversation and help you reflect upon the questioning pattern.
   a. Listen to the sequencing and phrasing of your questions.
   b. If you find yourself consistently using directive or closed-ended questions, or quick-fired drilling that requires the student to identify, list, describe, apply or respond with yes/no/I don't know; you may have a tendency to use a *non-strategic questioning pattern* that targets mostly WHAT level questions with some SO WHAT questions thrown in occasionally.
   c. If you consistently ask the student for their opinion or to defend their choices without first asking questions that prepare the student for higher level questions, you may have a tendency to use a *non-strategic questioning pattern* that targets mostly NOW WHAT level questions.
   d. If you find yourself consistently adapting questions to allow the student to state what they know about the situation (memory learning), then questions that assist the student in discovering the solution (discovery learning), and stating their own opinions (creative learning), you may have a tendency to use a *strategic questioning pattern*. You tend to sequence your questions to target increasingly complex cognitive processing skills.
2. Listen to your student's response both for content and process. Again the best method for doing this is via audiotape with the student's permission or by having an observer help you reflect upon the student's response from a content and process perspective.
   a. If their responses consist of basic declarative knowledge, recollection of facts, explaining or applying, the student is processing information using low-level cognitive skills in support of clinical competence.
   b. If the student appears to be struggling with his or her responses, your questions may not be clearly stated, ambiguous or are sequenced in such a way that does not prepare the student to sequentially build upon his or her knowledge base. (or they do not know the content)
   c. If responses consist of description provided in (2.a) AND responses indicate that the student is making connections among information or building upon prior information and discovering answers or additional questions for themselves, the student is processing information using both low and high-level cognitive skills in support of clinical competence AND clinical proficiency. (Remember that skill application is still a key component of both clinical competence and proficiency).
3. Ask your student.
   a. Check in with your student to find out what they think about your questioning skills. Ask them to describe what they have to do in order to respond to your questions or how your questions assist them in understanding content/skills.

Adapting Your Questioning Pattern and Style

1. First identify your student's current knowledge, skill and confidence base, and prior clinical experiences.
2. Determine the level of question complexity (level of cognitive processing skills that the questions target) and content that is appropriate for student's abilities.
   a. Beginner/ novice level students need to be asked more WHAT level questions until confidence is developed and competence established. Utilize more SO WHAT and NOW WHAT level questions for repeated exposures to same or similar experiences and information.
   b. Intermediate and advanced level students in novel experiences also may need more questions at the WHAT and SO WHAT level initially. Utilize more SO WHAT and NOW WHAT level questions for repeated exposures to same or similar experiences and information.
   c. All students who have had repeated exposures to similar or same content need to be challenged using SO WHAT and NOW WHAT level questions.
   d. Goal is to consistently integrate NOW WHAT level questions appropriately.
3. Evaluate clinical situation.

Timing is everything! If time or intensity of situation precludes in-depth questioning exchange, utilize a few well-phrased questions and be sure to follow up with additional questions/debrief once situation slows.

Feedback

Feedback is information the instructor provides to the student regarding the student's skill application, knowledge base, or professional behavior.[3] The goal of clinical experiences is competent patient care. Without feedback, mistakes go uncorrected, good performance is not reinforced, and clinical competence is achieved empirically or not at all.[3] Students look to his or her clinical instructors not only for direction, but also for confirmation and affirmation that what he or she is thinking, doing and saying is appropriate for the setting and situation.[4,29]

When a student enters a clinical learning experience, they bring with them large amounts of information and skills that they must then sort through to determine what is relevant in and applicable to the current situation.[28-30] Through contextual clues presented within the experience and feedback provided by the instructor, the student refines her or his knowledge and skill base as she/he move through clinical learning experiences.[4,28-30] In this way, the student begins to develop concepts of appropriate professional behavior and identity as well as build confidence and competence.[4,29]

Feedback is central to clinical education in promoting learning and ensuring that standards are met.[31] Although most clinicians are familiar with the principles of giving feedback, many clinicians probably do not recognize that numerous opportunities are present for using feedback as a teaching tool.[32] Feedback is a key step in the acquisition of clinical skills, yet feedback is often omitted or handled improperly in clinical supervision. Feedback should be viewed as an informed, non-evaluative, objective appraisal of performance intended to improve clinical skills.[3] The type and timing of the feedback provided is critical in achieving a positive educational outcome.[29]

Providing feedback effectively should include establishing an appropriate interpersonal climate, using an appropriate location, and establishing mutually agreed upon goals between the instructor and the student.[31] These guidelines should be established prior to the beginning of the clinical rotation. In addition, feedback should be nonjudgmental and based on observed behaviors and skills. Finding the correct amount of feedback that you should provide is just as important as the type.[32] Too much feedback can overwhelm the student and your educational outcomes could be negatively impacted. In addition, reinforcing positive feedback should be specific and needs to link the action of the student to the intended goal.

Within the clinical learning environment, feedback can be provided quickly and in a variety of situations using corrective and directive feedback.[33] Corrective feedback is used to alert a student that some aspect of either his or her knowledge base, understanding of a concept, or skill application is incorrect.[33] Corrective feedback also targets the lower level cognitive processing skills associated with knowledge, comprehension and application.[23] When providing corrective feedback, the instructor should avoid doing so in front of patients or other students if at all possible and in a way that does not degrade or insult the student.

For example, during a discussion on heat illnesses, your student sites conduction as one reason patients may overheat on hot sunny days. Appropriate corrective feedback might be, "I believe the cause you are describing is radiant heat; conduction involves the transfer of heat from one object to another through direct contact while radiant heat involves absorbing heat from a source, such as the sun." This comment from the instructor alerts the student that either his or her terminology or understanding of the concept was incorrect and provided the student with correct information without having stated "No. You are wrong." The feedback provided is specific and immediate without being negatively presented. In some situations, however, where patient safety is in question, corrective feedback may need to be more strongly worded or stated in front of the patient.

In the following example, a student is preparing a patient to receive an ultrasound-electrical stimulation treatment but has failed to connect the dispersal pad to the unit. An appropriate corrective feedback statement for this situation might be, "All steps have been successfully completed, but the dispersal pad needs to be connected." Again, this corrective feedback statement immediately alerts the student to what specifically is incorrect and how to correct the mistake. Often, corrective feedback can be followed with directive feedback.

Directive feedback is used to guide a student toward the correct information or used to help the student refine, clarify or enhance his or her response/action.[33] For instance, a student has correctly followed the steps for applying a thumb spica, yet the strapping is ineffective. Since all steps were correctly followed, the student does not need *corrective* feedback, but rather directive feedback, guiding them toward applying a more effective strapping. Appropriate directive feedback for this situation might be "your strapping is correct, but ineffective. You can try to increase the effectiveness of this strapping by doing x, y, or z." Directive feedback can also be phrased in the form a question: "your strapping is correct but appears to allow too much range of motion at the joint. How should you change your angle of pull to increase the effectiveness of this strapping?" The instructor has confirmed for the student that his or her knowledge and skill base for this technique is correct but uses directive feedback to guide the student on how to improve the technique and specifically, where the improvements need to be made. Directive feedback should be used to help the student reconsider his or her responses and skill application, and guide the student toward enhancing, clarifying or improving clinical application and reasoning skills.[33]

Questioning and Feedback

Clinical learning experiences are rich with opportunities to develop, refine and apply the critical thinking skills that serve as the basis for quality clinical decision-making. Students need to be taught during their clinical experiences how to recognize, gather, analyze, synthesize and utilize information in order to make affective, efficient, and safe clinical decisions. While questioning

and feedback are distinct pedagogical tools, the two should be combined, and used consistently and concurrently within in the clinical learning experience to stimulate and promote the student to think critically.

Questioning serves as a catalyst for learning or starts the learning loop, prompting the student to consider some sort of information. The student then responds in word or action and waits for confirmation or further direction from the instructor. The feedback provided by the instructor then closes the learning loop, which will then be followed again by another question, as the process is repeated again and again, eventually moving the student from being a health care technician, who relies on protocols and policies to determine all responses, to a quality health care professional who utilizes clinical reasoning to determine the best course of action for his or her patients.

The body of knowledge regarding clinical instructor questioning skills in athletic training clinical education experiences needs to be significantly expanded. Additional information should be gathered on the type and way current approved clinical instructors and clinical instructors pose questions during clinical experiences and how the way questions are posed impacts the student's clinical learning experiences. Additional research is needed to see if approved clinical instructors and clinical instructors can develop strategic questioning skills through workshops and training sessions. Longitudinal studies can be conducted following the same students through all their clinical rotations in which they are either only pared with instructors who utilize strategic questioning or only pared with instructors who do no utilize strategic questioning and compare students' development of clinical reasoning skills.

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