

Witchcraft and Physical Therapy Management: Application of the Inquiry-Based Model to Physical Therapy Education

Douglas R Keskula, PT, PhD, ATC

Elizabeth T Wark, PT, DPT, MBA

Dr. Keskula is a Professor and Dr. Wark is an Assistant Professor, College of Allied Health Sciences, Georgia Health Sciences University, Augusta, GA.

Address correspondence to: Douglas R Keskula, PT, PhD, ATC, Georgia Health Sciences University, College of Allied Health Sciences, AA-2028, 1459 Laney Walker Blvd, Augusta, GA 30912, USA. Tel 706-721-2621, fax 706 721-7312. dkeskula@georgiahealth.edu.

ABSTRACT

The purpose of this case report is to describe the inquiry-based model of instruction and its use in an entry-level physical therapy educational setting.

Educators facilitate the acquisition of critical thinking skills through their choice and application of various instructional strategies and methodologies. The inquiry model is designed to help students problem solve by facilitating the acquisition of both analytical and process skills. Practice and mastery of these skills are beneficial to students in the health professions, as they will need to transfer these abilities to the complex clinical setting. This is particularly true of physical therapists, who practice in an increasingly autonomous manner. The use of the inquiry model as an instructional method complements a learner centered environment. The learning activity described below is used as a bridge to the examination, evaluation and diagnostic process the physical therapy students will need to master in subsequent didactic and clinical educational experiences.

The selection of the problem used in the inquiry process is a key consideration to the success of the activity. The problem chosen must be interesting, intriguing and hold the attention of the students. A general problem such as the witchcraft example discussed in this paper is suitable for most disciplines, as specific clinical skills or content knowledge is not necessary for students to participate and be successful in this activity. The key element of the inquiry method is the debriefing session that concludes the activity. In the debriefing, faculty lead a guided discussion regarding the processes used by the learners to reach a viable solution to the problem. Areas examined include why certain hypotheses were formed, what information was sought and utilized by the learners to try to prove or disprove the hypotheses, and how the learners classified or grouped information together. The debriefing discussion highlights not the outcome of the problem but rather the critical reasoning process utilized by the learners to reach a conclusion, which is the primary goal of this learning activity.

Students consistently respond favorably to this activity as evidenced by their active participation and positive course feedback. The faculty and students of the entry-level physical therapy program have found this activity to be a very pertinent precursor to the critical reasoning required for the clinical diagnostic process. Practical guidelines for the organization and implementation of the inquiry model as a type of instructional strategy are presented.

Keywords: Inquiry-base teaching, physical therapy education, problem-based learning

Educators facilitate the acquisition of critical thinking skills through their choice and application of various instructional strategies and methodologies. Utilizing a variety of instructional methods allows the learner to obtain specific educational goals and objectives while also addressing individual student learning needs and styles. Both problem based learning (PBL) and inquiry-based instruction have been used to facilitate improvement in problem solving and critical thinking skills in health related professions (Foord-May, 2006; Miller, 2003; Tavakol and Reicherter, 2003; Saarinen-Rahiika and Binkley, 1998; Frost, 1996; Day, 1985). There is some confusion regarding the difference between problem based learning and inquiry-based instruction. Mahony, Wozniak, Everingham, Reid and Poulos (2003) describe PBL as a curricular approach built around highly structured problems in a resource rich environment. PBL is a common design in a student centered learning environment. In comparison, the inquiry-based model includes individual course instruction with less structured problems involving a process that is open ended and adaptive (Mahoney et al., 2001). Inquiry-based instruction also facilitates an environment where students are engaged in learner centered activities (Colburn, 2011). Both models can be used to promote student reflection on the learning process itself (Mahoney et al., 2003).

The inquiry-based model is designed to help students problem solve by stressing the acquisition of both analytical and process skills. This model incorporates the systematic data processing skills utilized by scientists when approaching new and puzzling situations (Day, 1985, Gunter, Estes, and Schwab, 1990). Day (1985) suggests the application of this model of instruction facilitates students' understanding of the cognitive processes involved in solving a problem. A desired outcome of this instructional methodology is that learners can then intentionally apply these process skills to address new problems in the future. Additional outcomes may include improving the learner's ability to think critically, communicate effectively, collaborate with team members, reflect on the learning process and grow in leadership skills (Justice, Rice, Roy, Hudspith, and Jenkins; 2009, Day, 1985).

It is widely accepted in the health professions that students require critical thinking skills to be successful in the complex and often ambiguous clinical setting. This is particularly true of physical therapists, who are expected to practice in an increasingly autonomous manner consistent with the American Physical Therapy Association's Vision 2020 statement (APTA, 1999). The inquiry-based model has been presented in the literature as a means of teaching students patient evaluation and treatment planning (Day, 1985). Use of this model helped physical therapy students become aware of the mental processes they use in solving a problem (Day, 1985).

The purpose of this case report is to describe the use of an inquiry-based model of instruction and its use in an entry-level physical therapy educational setting. Practical guidelines and examples are provided for the organization and implementation of this type of instructional strategy in a variety of disciplines.

I. Methods

The Commission on Accreditation in Physical Therapy Education (CAPTE) describes the academic environment for entry-level physical therapy programs as “providing opportunities to learn from and be influenced by areas of knowledge outside of, as well as with physical therapy. Within this environment, students will increase their awareness of multiple styles of thinking, diverse social concepts, values, and ethical behaviors thereby enhancing service to society and the profession” (Commission on Accreditation in Physical Therapy Education, 2011, p.B-v). Furthermore, CAPTE’s evaluative criteria state the expectation that PT educators utilize a variety of instructional methods to optimize learning and student outcomes within the entry-level curriculum (CAPTE, 2011, p.B-26). Students are expected to be able to use problem solving techniques in both simple and complex situations. Emphasis on critical thinking skills and the weighing of evidence are important components of the health professions academic environment.

The inquiry model activity described below is intentionally introduced early in the entry-level physical therapy curriculum for the skill mix it promotes. This instructional method provides the physical therapy student with an introduction to clinical problem solving strategies as they transition from foundational to more clinical courses. This activity is used specifically as a bridge to the examination, evaluation and diagnostic process the students will continue to develop in subsequent didactic and clinical educational experiences. The course level objective related to this activity is: *Demonstrate clinical decision-making skills, including clinical reasoning, clinical judgment, and reflective practice.* The class size ranges from between 35 to 40 students.

A. Inquiry-based model of instruction

Inquiry based instruction is a pedagogical method used to assist students in the development of guided questioning (Mahoney, 2003). It is hoped that this skill transfers to the targeted questioning a clinician uses to develop and test an appropriate hypothesis for each client encounter.

An overview of the steps of the inquiry model is summarized as follows: 1. The instructor selects and researches a puzzling situation or problem and possible solutions. The problem must be one that is genuinely interesting and stimulating to the learner; 2. The process is explained to the learners and the problem is presented. The instructor is the main source of data and will only respond to questions that can be answered with a “yes” or “no” response. The instructor has the option to provide additional information or to guide the questioning. It is also explained that the learners can only talk to each other during caucus periods where time is given for group discussion and cooperative work; 3. The learners ask questions to collect and verify data. It is the responsibility of the learners to phrase their questions appropriately. Learners may call for a caucus (or group discussion) to discuss the information and frame hypothetical questions to verify the theory; 4. The learners test various hypotheses and formulate a theory; 5. Once the theory has been verified by the group, the class discusses an explanation and application of the theory; 6. The inquiry process is reviewed and the group discusses the steps in solving the problem or arriving at an acceptable theory. The group also discusses how the process could be improved or expedited. Of particular importance is the guided analysis of the type of questions

asked and the determination of how learners could utilize more effective questioning techniques. (Gunter et al., 1990; Day, 1985) A summary of these steps is outlined in Appendix 1.

B. Witchcraft: an inquiry model example

The problem utilized for this experience is as follows: *In 1602 there occurred the worst outbreak of witch persecution in the US. The majority of those that were executed were in Salem, MA which is located in Essex County. The second largest number of cases was in Fairfield County, CT. No one has been able to prove why this occurred primarily in these locations almost 47 years after the last witch persecution in England. A number of theories have been proposed for this outbreak including the belief that the girls who made the accusations were hysterical, or that this was a political move by Cotton Mather.* (“Salem Witch Trials: Documentary Archive and Transcription Project,” 2002).

The steps in the model are followed by the class. Hypotheses generated by students in the past have included social, economic and health related reasons for this phenomenon. One theory discussed with the class is ergot poisoning as the cause of the behaviors noted in the individuals prosecuted in the Salem Witch trials. (“Ergot poisoning-the cause of the Salem Witch Trials,” n.d.)

Students are actively engaged in this activity, and during the analysis of the process, comments by students are very positive. Informally, students describe this learning activity as enjoyable and a helpful introduction to decision making. This feedback is consistent with data from course evaluations. Supplemental questions to the course evaluation were asked specifically about this activity for one class (39 students) and revealed the following: Ninety-one percent of students agreed or strongly agreed that this activity encouraged active learning. Ninety-two percent felt they had a better understanding of the diagnostic process after participating in this activity. One hundred percent of the students felt that this activity encouraged student/faculty interaction and ninety percent of the students agreed or strongly agreed that this activity encouraged cooperation among students. In the written comments, students stated this was an excellent introduction to the clinical decision-making process, and felt it was helpful to first demonstrate this process in a manner unrelated to a physical therapy problem. Many students stated the use of the inquiry model encouraged class participation and requested more of these kinds of activities. See Appendix 2 for sample comments from student’s perceptions on the impact of this activity on their learning.

III. Discussion

The overview of the inquiry model outlined above is very similar to what is described by Day (1985) and Gunter et al. (1990). Students gather and verify relevant data, test hypotheses and form theories, state rules and explain theories, and then analyze the process used to solve the problem. Physical therapy students often struggle with the complexity of the patient diagnostic process due to the amount and disorganization of the data gathered, and have difficulty forming clinical conclusions (Gunter et al., 1990; Day, 1985). We feel that the selection of the inquiry model using the witchcraft activity is an appropriate and beneficial instructional method to introduce physical therapy students to the process they will use for diagnostic problem solving. Accuracy in the diagnostic process is a critical skill for an entry-level physical therapy student,

and is further developed in subsequent clinical courses. As the learner gains experience in these skills, there is a progression to more complex problems specific to the discipline.

The selection of the problem in inquiry-based instruction is important for the success of the activity. The problem must be interesting, intriguing and hold the attention of the student. Specific skills or prior content knowledge is not necessary for a learner to participate in this activity. For these reasons, a general health related problem such as the witchcraft example provided is suitable for a variety of disciplines. Learning activities using the inquiry model may become more discipline-specific based on course objectives and timing in the curriculum.

The key element of the inquiry method is the debriefing session that concludes the activity. Following the group activity, faculty lead a guided discussion regarding the processes used by the learners to reach a viable solution to the problem. Areas examined include why certain hypotheses were formed, what information was sought and utilized by the learners to try to prove or disprove the hypotheses, and how the learners classified or grouped information together. The debriefing discussion highlights not the outcome of the problem but rather the critical reasoning process utilized by the learners to reach a conclusion, which is the primary goal of this learning activity. Day (1985) describes another helpful strategy during the debriefing includes having the instructor (expert) verbalize their approach to solving the presented problem. This technique further facilitates the learners' understanding of the systematic approach used.

Students are encouraged to identify ways to improve or expedite the processes they utilized in coming to a conclusion in the witchcraft activity. Students evaluate their individual as well as the group's thought processes and questioning techniques. An effort is made to identify obstacles in the problem solving process and discuss strategies to eliminate these barriers in the future.

There are several practical considerations regarding the effectiveness of this group activity. The activity requires approximately forty-five minutes to an hour to complete. There are several administrative challenges in implementing any change in the curriculum, inquiry-based instruction included. These may include resistance to new instructional approaches, and instructors' unwillingness to incorporate the model into their teaching. (Justice, et al., 2009) To facilitate the planning and implementation of inquiry-based instruction, support from leadership, peer support and appropriate external resources are crucial. Effective promotion of the outcomes of the model and ease of application may minimize faculty concerns as well as faculty development opportunities regarding new instructional methods (Foord-May, 2006).

IV. Summary

Inquiry-based instructional activities may be selected by educators as an appropriate teaching method to meet specific learning outcomes. The inquiry model applied to the physical therapy educational setting has been discussed as a method to address goals related to the acquisition of problem solving skills. In particular, this pedagogical method assists students in the development of guided questioning. It is hoped that this skill transfers to the targeted questioning a clinician uses to arrive at an appropriate hypothesis for each client encounter. Practical guidelines and examples are provided for the organization and implementation of this type of instructional strategy.

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Appendix 1. Overview of the Inquiry Model.

1. Selection of the problem / research
2. Introduction of the process
3. Gather and verify relevant data
4. Test hypothesis and form a theory
5. State rules and explain theory
6. Analyze the process

Appendix 2. Sample Comments from Course Evaluations.

- The activity was a creative way for us to reason through a problem and put pieces together to form a big picture.
- Great way to get our minds turning w/o feeling like they were working – it was a nice change
- Very creative method of teaching the process of clinical decision making
- I really enjoyed the activity; it was a nice change of pace in the classroom!
- I feel that this activity was an excellent introduction to clinical decision making.
- This activity was helpful in demonstrating clinical decision making and developing hypotheses.
- I thought it was an interesting way to help us discover the importance and method of clinical decision making.
- I think that this activity helped to clarify what type of process that we were expected to go through for clinical decision making.
- It was an innovative way to encourage critical thinking to give us an idea of the thought processes we were being cued in on for clinical decisions
- It was an interesting discussion. A good way to encourage class participation and peak interest.
- Please give more witchcraft like exercises to facilitate learning.
- I liked the different approach to help us refine our problem solving and evaluation skills.