

Research and Critical Thinking : An Important Link for Exercise Science Students Transitioning to Physical Therapy

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ABSTRACT

Int J Exerc Sci 5(2) : 93-96, 2012. Critical thinking skills are increasingly necessary for success in professional health care careers. Changes in the contemporary healthcare system in the United States arguably make these critical thinking skills more important than they have ever been, as clinicians are required on a daily basis to evaluate multiple bits of information about patients with multiple-systemic health concerns and make appropriate treatment decisions based on this information. We believe the IJES, with its emphasis on engaging undergraduate and graduate students in research and scholarly activity, is a valuable resource for promoting the higher-order critical thinking skills necessary for preparing exercise science students with an interest in professional healthcare careers such as physical therapy.

KEY WORDS: Critical thinking, research, scholarship, exercise science, physical therapy, healthcare

Higher-order critical thinking skills are necessary for students preparing for and/or enrolled in professional programs, especially the ability to evaluate and synthesize information, which are vital for problem-solving. Essentially, critical thinking is learning to think independently and to develop one's own opinions supported by existing evidence. In learning scenarios that promote and foster problem-solving and critical thinking skills, it is much more difficult for the student to simply adhere to the role of the passive student; rather, this type of learning

prompts the student to assume the role of a self-reliant thinker and researcher.

However, attaining critical thinking skills does not come without its challenges as students must be able to manage a vast array of resources within a series of complex network systems. This is especially true when students are asked to write a research paper, which is one of the most common methods for teaching critical thinking skills. Inherent within writing a research paper are various levels of reasoning with each level becoming progressively more abstract, complex, and

effortful. This, according to Bloom's taxonomy, promotes higher-order thinking skill and more critical thought in the form of synthesis-level thinking and builds upon the prior skill levels in a hierarchical fashion (1). However, when confronted with this seemingly daunting task, many college students shy away; presumably, because they lack these skills and therefore need to be taught how to learn and apply them (2, 4).

Upon closer scrutiny, deficiencies in critical thinking skills among students may rest with the educational system itself, which often stresses memorization of voluminous amounts of material essentially unrelated to any type of application at all (2). The question then arises as to the extent which critical thinking is initiated during a student's education in any given institution in higher education. As such, any focus on learning without critical thought becomes less meaningful, thereby disengaging students from any formal training and experience specifically as it relates to critically reviewing and evaluating research (3).

Arguably, an important component of critical thinking skills is the ability to critically examine and understand published research in one's professional area of interest (7). Requiring students to critique published research is one way of addressing the goal of teaching students to critically evaluate research while gaining experience doing it (3). At its very essence, scientific research is a problem-based learning activity that sharpens critical thinking skills.

An even greater challenge, and one that provides a framework for differentiating

between different levels of learning and thought by incorporating reasoning and critical thinking skills to a greater degree, is to actually engage students in the scientific method. Here, students actively participate in the formulation of a research question, data collection, and statistical analysis as a means of creating a learning environment that encourages or even forces them to engage in critical thinking and higher level reasoning. This process is arguably complete only when students are encouraged to complete the manuscript submission process in order to publish their research. Additionally, the manuscript submission process teaches students to be consumers of information while constantly examining, questioning, and evaluating the credibility of sources as they make sense of their own work (6).

Thus, we see the *International Journal of Exercise Science* (IJES), with its aim on engaging undergraduate and graduate students in scholarly activity, as a quite suitable vehicle for promoting critical thinking skills in exercise science students interested in entering professional programs such as physical therapy. For example, a very meaningful way to engage students is to enlist their support in a research effort of interest to them and for them to assist in the publication process. Given changes seen among Kinesiology majors on the undergraduate level in recent years, the IJES, with its emphasis on student involvement in the research process, is a great venue for disseminating research findings emphasizing this type of undergraduate student involvement (5). The research findings typically published in this journal are highly relevant to physical therapy given the central role of exercise within this healthcare profession.

We encourage all authors who work with undergraduate students interested in physical therapy to publish in this journal. Doing so will help to "raise the level" of critical thinking skills for all students involved. Among other things, doing so would also provide another valuable measure for evaluating applicants to physical therapy programs. We believe that student experiences of this nature are helpful when making admissions decisions for physical therapy programs, in part because evidence of prior research experiences provide some indication of a given student's ability to handle the level of critical thinking necessary for success within a physical therapy education program.

In other words, while measures such as undergraduate GPA and exam scores on standardized aptitude tests are helpful in the selection process, they are certainly finite and incomplete measures for predicting which students are most capable of handling the rigors of these graduate professional programs. We believe that undergraduate research experiences provide an emphasis on higher-order critical thinking skills that are often hard to replicate in other parts of the typical undergraduate educational experience, and these experiences typically translate broadly into academic success when these students matriculate into graduate professional programs such as physical therapy.

When viewed from another vantage point, the IJES may also serve as a vehicle for further refining critical thinking skills once students are enrolled in graduate professional programs. In this same vein,

we also encourage researchers working with students enrolled in Doctor of Physical Therapy (DPT) programs to publish in the IJES. Physical therapy curricula typically employ a research course sequence as part of the overall curriculum, as a means of fostering critical thinking skills for all students involved, and many projects completed in this manner are particularly suitable for publication in this journal. Many of the manuscripts published to date in the IJES are similarly highly generalizable to therapeutic exercise scenarios regularly encountered in physical therapy practice, providing a valuable resource for students and practicing clinicians alike.

The free, full-text format of the IJES further increases the attractiveness of this journal, as anecdotal evidence suggests that both students and practicing clinicians are mostly likely to use the resources they can access most easily. Thus, DPT faculty can confidently point to manuscripts in this journal as 1) resources for promoting evidence-based clinical practice as well as 2) an attainable target for publishing their own work. Realizing any of these aims on a consistent basis can contribute to stronger critical thinking skills and perhaps higher clinical outcomes for all involved.

In summary, higher-order critical thinking skills are increasingly necessary for success in professional health care careers. Changes in the contemporary healthcare system in the United States arguably make these critical thinking skills more important than they've ever been, as clinicians are required on a daily basis to evaluate multiple bits of information about patients with multiple-systemic health concerns and

make appropriate treatment decisions based on this information.

We believe the IJES, with its emphasis on engaging undergraduate and graduate students in research and scholarly activity, is a valuable resource for promoting the higher-order critical thinking skills necessary for preparing exercise science students with an interest in professional healthcare careers such as physical therapy. This viewpoint is based not only upon our experience working with students who enter DPT programs possessing strong higher-order critical thinking skills honed through undergraduate research activities, but also partly upon the many research projects students complete in DPT programs that are highly suitable for dissemination in this journal. The IJES has much potential for strengthening the existing bonds between exercise science and physical therapy that benefit all involved.

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