Title:
Facilitating Problem Solving and Critical Thinking Using a Comprehensive Pedagogical Approach

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Abstract Summary:
Promoting development of critical thinking and problem solving skills in nursing students is imperative to prepare them for complex health environments. Researching pedagogical approaches that facilitate this development is needed. The study used real life case studies to promote the development of critical thinking and problem solving in nursing students.

Learning Activity:

LEARNING OBJECTIVES	EXPANDED CONTENT OUTLINE
Explain the benefit of using real-life case studies to promote critical thinking and problem solving skills.	Research will be presented on previous success of the case study approach to foster critical thinking and problem solving.
Interpret the differences in student's critical thinking and problem solving abilities before and after exposure to a comprehensive pedagogical approach.	Statistical information will be presented on the students' critical thinking and problem solving abilities before and after they were exposed to the comprehensive pedagogical strategy.

Apply a comprehensive pedagogical approach to own academic practice.	Detailed information will be provided that fosters the implementation of the pedagogical approach to others' academic practice.

Abstract Text:

In researching present nursing education in the classroom, Benner, Sutphen, Leonard, and Day (2010) found a sharp contrast compared to the rich situated learning experience of the clinical setting in the theory component of nursing education. Historically, the theory portion of instruction in nursing has been presented in a traditional teacher-centered format where the teacher is regarded as the one with the knowledge and their role is to disseminate this knowledge to the student (Benner, et al., 2010; Peters, 2000). The expectation of the student has been to regurgitate the information on tests and assignments (Peters, 2000). Based on findings during the research by Benner et al. (2010), this approach is still wide spread and is not facilitating the transfer of critical thinking and problem solving abilities needed by today's nurses in the present health care environment.

The AACN (2008), Benner et al. (2010), Hodges (2011), the Institute of Medicine (IOM), as presented by Greiner and Knebel (2003) and Skiba, Connors, and Jeffries (2008) have called for a change to nursing education because of evidence that new nurses are not being prepared for practice. Hodges (2011) proposed incorporating a constructivist pedagogy combined with problem-based learning (PBL) in which students are immersed in real-time health practice scenarios to allow for inquiry and solving of real life problems. Benner et al. (2010) suggested that decontextualized knowledge presentation in the classroom should be replaced with the pedagogy of situated cognition.

To address these concerns a research study was conducted in 2012 (Stark, 2013) to investigate the effect of classroom pedagogy that focused on real life health practice scenarios with scaffolding interventions to promote the development of critical thinking and problem solving in senior students. This study used two scaffolding techniques of question prompts and expert modeling. Findings from this study provided evidence that only one scaffolding technique was not sufficient to increase student's critical thinking and problem solving abilities. Qualitative data provided evidence that the students felt the real life case studies promoted learning and was preferred to the lecture and slide approach to classroom teaching.

Studies by Choi and Lee (2009), Ge and Land (2003), and Ge, Planas, and Er (2010) incorporated peer and group discussion within their study designs. Given the positive results of their findings, it seems important to include some form of peer or group interaction within the learning of critical thinking and problem solving, as this would support social construction of knowledge and active learning. Based on these findings the research study used a comprehensive pedagogical approach to foster critical thinking and problem solving skills. The Stdesign-included use of real life case studies with question prompts, Discussions in peer teams and the whole class, and expert modeling.

The study used a longitudinal, quasi-experimental, repeated measures design to compare critical thinking and problem-solving skills in nursing students before and after a comprehensive pedagogical approach was implemented during the senior semester in a leadership course within one Midwest baccalaureate program. The research question was, are there differences in critical thinking and problem solving as a whole and its components over a semester in a course using a comprehensive pedagogical approach (real life studies, questions prompts, peer discussion, and expert modeling)? The sources of data for the study included initial and final reports students submitted as part of their course requirements, scores derived from the investigators evaluations of the student's reports using critical thinking and problem solving rubrics, and a standardized critical thinking measure. Forty-four students were willing and consented to participate in the study and allow use of their data.

The students solved real life case studies throughout the semester. For the first case study they submitted a response to the case without any scaffolding. For this and all subsequent case studies they

completed a solution report with questions prompts to guide them through the process. The students then met in class to discuss the case study in a small group, and then the entire class discussed the case study with an expert. Students then were required to revise the case study report with the added information and knowledge gained during interactions with classmates and the instructor as an expert model. All data were de-identified prior to analysis.

As a part of the nursing program requirements, students took a standardized ATI Critical Thinking Entrance/Exit exam (Assessment Technologies Institute, n.d) entering the first nursing courses. They re-took this same exam at the end of their last semester for comparison between the two exams. Willing students also took the exam at the beginning of the course to allow comparison of scores before and after the case studies with scaffolding; this examination was completed as part of the study. The Cronbach's Alpha is .732, showing reliability at .8-.7 at the acceptable level (Assessment Technologies Institute, n.d). The reliability of the exam was established by Assessment Technologies Institute (n.d) through statistical analysis using Cronbach alpha and Guttman split-half coefficient with results for Alpha = .6942 and Standardizes item alpha = .7012.

All data has been collected for the study with data analysis in progress. Critical thinking and problem-solving rubric are being used to score the solution reports. The participants' solution reports are being scored using the Holistic Critical Thinking rubric (Ralston & Bays, 2010) which is based on Paul and Elder's Critical Thinking Framework (2009). Ralston & Bays (2010) used the case study approach to promote and then evaluate critical thinking. This instrument was used to evaluate critical thinking of college engineering students. The interclass correlation coefficient sited by Ralston and Bays (2013) for the Holistic Critical Thinking Rubric ranged from 0.94 to -0.811. Problem solving is being scored using Tidwell's (2015) Problem-Solving Rubric. Tidwell's (2015) rubric was designed to evaluate the relevant components in the problem-solving process involving Executive MBA students' analysis of case studies. The rubric used in Tidwell's (2015) study was from the National Center for Research on Evaluation, Standards & Student Testing (CRESST). The research investigators will work to gain adequate inter-rater reliability using the instruments and then score the solutions reports individually. Final scores will be determined by averaging the two independent scores.

This study has important implications for nursing education. Supporting learners as they work through solving ill-structured problems is an important endeavor due to the real life personal and professional problem situations that are faced in all-professional interactions. Through the process of solving ill-structured problems in real life case studies students have the opportunity to promote knowledge transformation from the cases to other personal and professional problems. Commitment to life long learning is of essence in nursing practice due to the rapid changes occurring in the health care environment. Equipping students with higher-level critical thinking and problem-solving skills could possibly promote this commitment due to increased ability to find value in continual learning

Nursing faculty need research based information to guide them in developing instructional strategies and learning environments that promote and support real life critical thinking and problem solving. The results of the study would add to the body of knowledge related to facilitating increased knowledge and skills in critical thinking and problem solving.