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Education Innovations

Scaffolding questions to foster higher order thinking

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ABSTRACT

Nursing instructors must select teaching strategies that foster clinical judgment to prepare nursing students for licensure and practice. Questioning is not a new strategy, but it is an effective method to engage students in higher-order thinking including clinical judgment. By scaffolding and sequencing the questions around Bloom's Taxonomy, instructors can guide student thinking in a stepwise fashion toward the evaluation and synthesis levels where clinical judgment occurs. This manuscript provides instructions on how to employ scaffolded questions to foster clinical judgment.

Nursing instructors are challenged to prepare students for the licensure exam as well as practice by engaging them in clinical judgment exercises. Questioning as a teaching strategy is one option. Sequential, scaffolded questions that apply Bloom's Taxonomy can coach a learner through simple recall and comprehension level thinking to higher-order thinking (Anderson et al., 2021; Faravani & Taleb, 2020). Early studies demonstrated that nursing faculty, including clinical faculty, tend to rely on questions that elicit lower-order thinking such as remembering and understanding (Craig & Page, 1981; Phillips & Duke, 2001; Sellappah et al., 1998). Jessee & Tanner's (2016) more recent study identified that university faculty and clinical instructors used more higher-order questions compared with staff nurses in a preceptor role. While questioning is not a new instructional method, perhaps it is time to build upon the work of earlier nursing literature and refresh instructor skills in questioning (Farmer et al., 2021; Huang et al., 2016; Jesse & Tanner, 2016; Nichol & Tracy, 2007; Seibert, 2022). This manuscript will describe the process of sequentially scaffolding questions to coach nursing students' clinical judgment.

Scaffolded learning is an instructional design in which student learning is supported with clues, background information, and direction. Then, as the student begins to make connections between concepts and gain confidence, the support is weaned off (Jarvis & Baloyi, 2020). Chen and colleagues (2021) describe scaffolded learning as "the temporary assistance given to students to help them with problem solving" (p. 2). Scaffolded learning can be used to engage students in higher-order thinking including clinical judgment (Jarvis & Baloyi, 2020; Postma & White, 2016; Seibert, 2022). To employ scaffolded questions, instructors sequence question prompts that build upon prior knowledge. The instructor progressively queries the student with more questions and thereby guides the student to discover answers and make decisions (Seibert, 2022). Bloom's Taxonomy provides a template for instructors to frame questions that progresses students' lower-level thinking to higher-order thinking (Farmer et al., 2021).

In my experience, the process of scaffolding questions can begin in two ways. The first and most used method is for an instructor to approach a student with an intention to ascertain the student's knowledge about their patient, a disease process, or medication or therapy. The second way to employ scaffolded questions is for an instructor to reply to a student's question with a question. Sometimes answering a student's question can stop the thinking process (The Foundation for Critical Thinking, 2019). For instance, when an instructor provides an answer, the student may take the answer at face value and memorize it as fact (The Foundation for Critical Thinking, 2019). Memorizing the instructor's answer involves recall learning which is the lowest level of cognition. The Foundation for Critical Thinking (2019) suggests that students will likely memorize an instructor-provided answer as fact without the mental work of comprehension, application, analysis, etc. However, if an instructor replies to the student's question with a question and scaffolds the questions in a way that leads the student to discover the answer, the student utilizes higher-order thinking (Makhene, 2019). Furthermore, the use of higher-order thinking may form connections that could promote long-term memory (Foundation for Critical Thinking, 2019).

Instructors can learn to use scaffolded questions by following Bloom's Taxonomy as a template. Early works by Craig and Page (1981), Sellappah et al. (1998), and Phillips and Duke (2001) as well as a more recent tools developed by Farmer et al. (2021) and Nicholl &

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Table 1
Examples of Scaffolded Questions/ Prompts.

Examples of Scaffolded, Sequential Questions			
Levels of Cognition	Question example: Patient disease	Question example: Medication	Question example: Lab value
Remember	What is the definition of asthma?	What class of medication is furosemide?	What lab test will provide insight regarding infection?
Understand	Describe the anatomy and physiology of the airways and explain what happens pathologically in asthma.	Describe the mechanism of action of furosemide?	Describe how the body fights infection.
Apply	What signs and symptoms do you anticipate for a patient suffering from an asthma attack?	What effect do you expect to see when you administer furosemide? What data will you gather to determine if this medication is "working" for your patient?	Describe the expected results for a patient with a bacterial infection.
Analyze	Compare the expected findings with the assessment data that you gathered.	According to your patient's data, how is your patient tolerating this medication? Is the medication working?	Based on your patient's white blood cell count and differential, do you think this patient has an infection?
Evaluate	Based on your assessment of the patient, is their condition improving? What assessment findings informed your determination of your patient's status?	Did your patient have a positive, negative, or neutral effect with this medication?	Examine the trends in your patient's white blood cell count and vital signs as well as the culture report. Do you think this patient's infection is resolving or getting worse?
Create	Now that you have examined this information about your patient, what do you plan to do?	Based on your examination of this information, what do you plan to do (withhold the medication, call the physician, administer the drug as prescribed, etc.)?	Knowing this information, what is the priority intervention?

Tracy (2007) provide suggestions for questions to ask within each of Bloom's levels of cognition. I recommend starting by asking for a definition (recall), then describing the anatomy, physiology, and pathophysiology (comprehend). Next in the sequence, ask about expected assessment findings (apply) and then ask the student to compare expected findings with actual findings (analyze). The questioning would progress to inquire if the patient's status is improving or declining and what data support that determination (evaluate). The questioning culminates in asking the student to propose a plan of action (create). This process scaffolds comprehension that builds from simple to complex and from what is known to what is yet to be discovered.

For example, an instructor can initiate the process by asking the student to remember a definition of their patient's disease. This can be a simple inquiry like "Tell me what you know about heart failure." After the student provides their definition, then the instructor can build on the definition by asking the student to describe their understanding of the normal anatomy and physiology of the heart along with the disease pathophysiology of heart failure. Next, the instructor can scaffold the sequence by asking the student to apply knowledge of the disease state by describing expected assessment findings in patients with heart failure. Then, the instructor can engage the student in analysis by asking them to compare expected assessment findings to the patient's actual signs and symptoms or the instructor could request that the student interpret a related lab value such as a brain natriuretic peptide (BNP) level. Subsequently, the instructor should prompt the student to evaluate the patient's status as improving or declining based on the student's assessment findings or interpretation of the lab value. The culmination of the sequential, scaffolded questioning occurs by asking the student to identify the plan of action. This question could be as simple as "What will you do next?" The sequence guides the student to make an informed clinical judgment.

If a student approached the instructor with a question, the instructor would begin the process in the same way, by asking the student to first recall what they already know about the topic and then scaffold questions or prompts in the same sequence as above. By not answering the question and instead asking questions, an instructor can help a student discover the answer on their own. Table 1 provides examples of scaffolded questions that could be applied for a disease state, a medication, or a diagnostic test.

Implications to Teaching

Scaffolding questions is a teaching skill that can be learned. If used often, questioning may guide student clinical judgment development. The sequence can become a "habit of the mind," a way of thinking, when faced with clinical decisions, uncertain concepts, or difficult circumstances. This teaching strategy can enhance student progression to "thinking like a nurse."

Scaffolded questions and prompts can be used in any setting to engage students' higher-order thinking. For example, this strategy can be used in clinical settings, seminars, learning labs, and during simulation debriefings. Furthermore, the process of sequential, scaffolded questioning, allows instructors an opportunity to evaluate the student's knowledge of medical, pharmacological, and nursing concepts as well as assess their critical thinking and clinical judgment abilities based on their answers to the questions. Scaffolded questioning is not a new teaching strategy, yet now may be the time to revive instructor skills in using this strategy.

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