Tutorial

A Tutorial for Implementing Strategic Questioning in the Clinical Teaching Environment

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Purpose: The implementation of strategic questioning within the clinical teaching context has recently gained appeal among clinical educators as a method for stimulating critical thinking and other higher order thinking skills. This article will (a) address evidence for the use of strategic questioning approaches in the clinical teaching environment, (b) examine some of the complexities associated with effectively selecting and implementing questioning types, and (c) discuss the potential significance that supervisory training and self-assessment may have on effective application of strategic questioning.

Conclusion: Strategic questioning can be a highly valuable teaching methodology within the clinical teaching context. Current available external evidence, albeit limited, provides some insight into the complexities involved with effectively implementing strategic questioning methods. Further research is needed to explore the efficacy and feasibility of specific strategic questioning approaches within the scope of communication sciences and disorders.

Clinical educators within the scope of speech-language pathology and audiology have begun placing greater emphasis on the need for more systematic methods of clinical teaching (Procaccini, Carlino, & Joseph, 2016). In recent years, the use of questioning, also referred to as *questioning strategies*, *questioning techniques*, or *strategic questioning*, has gained allure among clinical educators as a viable teaching tool for maximizing learning (American Speech-Language-Hearing Association [ASHA], n.d.; Barnum, 2008; Cook, Messick, Ramsay, & Tillard, 2019; Phillips, Duke, & Weerasuriya, 2017; Tofade, Elsner, & Haines, 2013). Although questioning in itself may be considered a somewhat generic, ubiquitous method of teaching, if used strategically with intentionality, it may prove to be quite powerful in a teaching–learning context (Dietz-Uhler & Lanter, 2009; Hausmann & Schwartzstein, 2018; Tofade et al., 2013).

Historically, the use of questions with the intention of facilitating knowledge gains and higher order thinking skills has been common practice among educators across most teaching contexts (Tienken, Goldberg, & DiRocco,

2010; Tofade et al., 2013). In fact, external evidence has suggested that the use of questions within the teaching context has dated as far back as Socrates, hence the Socratic method (Tienken et al., 2010). Additional evidence has also suggested that formulating productive questions appropriate to the needs and skill level of the learner may be more complex than initially thought (Barnum, 2008; Tofade et al., 2013). For example, assessing the level of difficulty, phrasing, type, sequencing, frequency, and timing of the question may all influence a successful learning outcome (Barnum, 2008; Cook et al., 2019; Hausmann & Schwartzstein, 2018; McCrea & Brasseur, 2003; Tofade et al., 2013). To add to the complexities, students may demonstrate higher productivity in accessing and exercising higher order thinking functions in a learning environment that is considered psychologically safe and positive by the learner (Burningham, Deru, & Berry, 2010; Curtis, Helion, & Domsohn, 1998; Detsky, 2009; Pitney, Ehlers, & Walker, 2006; Thrasher, Walker, & Weidner, 2018; Tofade et al., 2013). Furthermore, even when selection and implementation of questions posed by the educator are appropriate, if the learner has not gauged the environment to be encouraging and positive, then the successfulness of

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the question may be weakened. Therefore, asking questions without deliberate thought and reflection may result in an ineffective learning environment. One may further argue that deliberate thought and reflection combined with the complexities involved with assessing the effectiveness of questioning would oblige training, self-assessment, and level of critical thinking also on the part of the educator.

For the purposes of this article, the term *strategic questioning* will be used in lieu of *questioning* or *questioning techniques* in an attempt to better characterize the aspect of systematic methodology and intentionality when formulating questions. Barnum (2008) described strategic questioning, whereby the clinical educator made conscious adaptations to question formulation. Similar to Barnum's definition, *strategic questioning*, as it pertains to this article, will be defined as a systematic and deliberate method for formulating questions with the intention of stimulating knowledge gain, critical thinking, and other higher order thinking skills within a teaching–learning context. The aims of this article will be to

1. address evidence for the use of strategic questioning approaches in the clinical teaching environment,

2. examine some of the complexities associated with effectively selecting and implementing questioning types, and

3. discuss the potential significance that supervisory training and self-assessment may have on effective application of strategic questioning.

Strategic Questioning Approaches

Although strategic questioning is quickly gaining appeal among clinical educators, there is no universally preferred model considered as the "best practice" within the scope of clinical teaching in speech-language pathology and audiology. In fact, the current available strategic questioning approaches have all been founded in disciplines outside speech-language pathology and audiology, such as medicine (Neher, Gordon, Meyer, & Stevens, 1992), athletic training (Barnum, Guyer, Levy, & Graham, 2009; Barnum, Guyer, Levy, Willeford, et al., 2009), and even philosophy (Browne & Keely, 2015; Oh, 2005; Toledo, 2015; Yang, Newby, & Bill, 2005). Similarly, disciplines outside speech-language pathology and audiology comparatively show a lack of standardization in terminology and methodologies used when referring to questioning approaches used within a teaching context. Much of the existing literature provides descriptions about questioning styles and trends among educators. For example, studies have shown that educators often pose lower order questions more frequently than higher order questions (Barnum, 2008; Cook et al., 2019; Ertmer, Sadaf, & Ertmer, 2011; Irby, 1995; Phillips et al., 2017; Sellappah, Hussy, Blackmore, & McMurray, 1998). Lower order questions typically involve requests to determine basic knowledge and comprehension about a given topic. Lower order questions can often be used to determine what the learner knows about

a given topic (Barnum, 2008; Cook et al., 2019; Ertmer et al., 2011; Irby, 1995; Phillips et al., 2017; Sellappah et al., 1998; Tofade et al., 2013). Questions might involve having the learner recall basic factual information (e.g., What is ___? Define ___), identify foundational concepts and patterns (e.g., List the common patterns observed in ___, Name some examples of ___, What are the differences between ___ and ___?), or confirm that that he or she understands meaning (e.g., The common characteristics of ___ typically means ___, What do those observations you listed mean?). Higher order questions typically involve requests to evaluate, analyze, or synthesize information (Barnum, 2008; Cook et al., 2019; Ertmer et al., 2011; Irby, 1995; Phillips et al., 2017; Sellappah et al., 1998; Tofade et al., 2013). Higher order questions are often used to stimulate deep thinking about a subject matter and tap into a higher level of thought processing about a given topic. Questions might involve having the learner provide supportive evidence for a decision or conclusion (e.g., What external evidence exists in support of ___?), explain an alternative solution (e.g., Provide an alternative perspective to ___, Provide a for and against statement for ___), identify assumptions and fallacies in reasoning (e.g., Explain why that data set is misleading? After critically appraising the evidence, what are some of the limitations to ___?), or self-identify biases (e.g., Did bias play a role in affecting my objectivity or judgment of ___?).

There are certainly commonalities across strategic questioning approaches. Most, if not all, strategic questioning approaches strive to maximize the learning environment by developing knowledge and skills, many specifically citing critical thinking skills. Other common themes include deliberate adjustments to timing, sequencing, phrasing, and type of question. Interestingly, even the models that were developed within nonclinical disciplines share commonalities with the clinically focused models. For example, question phrasing and sequencing are integral components to both philosophically based strategic questioning models such as Socratic questioning and clinically focused models such as the supervision–questioning–feedback (SQF) model. In addition, the clinically focused models are often rooted in nonclinically based theory. For example, the SQF model was developed from theoretical concepts from Bloom's (1956) taxonomy, a framework specific to the field of education. In the sections that follow, some of the specific strategic questioning approaches reported in the literature will be reviewed more extensively.

SQF Model and Other Approaches
Based on Bloom's Taxonomy

One method for classifying strategic questioning is through the use of hierarchical taxonomies intended to stimulate the learner's critical thinking and other higher level thinking processes. Many hierarchical strategic questioning approaches reported in the clinical literature give reference to Bloom's (1956) taxonomy or Anderson and Krathwohl's (2001) revised version of Bloom's taxonomy. At least three different clinical disciplines, pharmacy,

medicine, and athletic training, have reported the use of strategic questioning approaches based on Bloom's taxonomy. For example, in pharmacy, Tofade et al. (2013) described the use of both Bloom's taxonomy and Anderson and Krathwohl's revised version of Bloom's taxonomy "to formulate questions intended to elicit specific cognitive processes" when teaching pharmaceutical concepts related to pain management (p. 2). The authors discuss formulating questions for the purposes of addressing low to high levels of cognition, ranging from recall of memorized facts to generating alternative hypotheses. Similarly, Hausmann and Schwartzstein (2018) describe the use of Bloom's taxonomy when formulating strategic questions intended to stimulate critical thinking when teaching rheumatologic concepts. Last, and perhaps the most systematically structured approach based on Bloom's taxonomy, is the SQF model. The SQF model is a clinically focused supervisory model developed within the discipline of athletic training that hierarchically adjusts the level of supervision, questioning, and feedback to the learner's needs and experience level (Barnum, Guyer, Levy, & Graham, 2009; Barnum, Guyer, Levy, Willeford, et al., 2009). Clinical educators systematically pose questions, ranging from low to high levels, based on of Bloom's taxonomy (Anderson & Krathwohl, 2001; Bloom, 1956). Lower order questions, often beginning with "what is…," are based on the lowest level of Bloom's taxonomy with the intention of seeking out basic facts about a subject area. Higher order questions, often beginning with "how…." or "why…," assume basic factual knowledge and seek to connect factual knowledge with higher order thinking skills for a deeper command of content. Frequency of question types is adjusted to the needs and skill level of the learner. For example, a clinical educator may pose primarily lower order questions with only a few higher order questions to a novice learner. More experienced learners may be asked primarily higher order questions with only a few lower order questions to confirm comprehension of basic facts. The clinical educator's role is to deliberately and accurately adjust questioning type and frequency, as well as apply the appropriate specific feedback and supervision to the individual needs of the learner. Bloom's taxonomy, as also described by Tofade et al. and Hausmann and Schwartzstein, is intended to be used as a tool to guide question formulation. The similarities noted across clinical disciplines in using this type of hierarchical structure when formulating strategic questions provide some supportive evidence for the potential generalizability of the approach across clinical teaching disciplines, including speech-language pathology and audiology.

Philosophically Based Approaches: Argument Analysis and Socratic Questioning

Strategic questioning approaches rooted in philosophy have also been reported in the literature as a means for maximizing learning and stimulating critical thinking. Both argument analysis and Socratic questioning are similar philosophically based approaches that include the component of strategic questioning for the purposes of facilitating critical thinking (Browne & Keely, 2015; Pang, 2008; Toledo, 2015). Finn, Brundage, and DiLollo (2016) discuss both argument analysis and Socratic questioning approaches when providing recommendation strategies for helping future speech-language pathology and audiology clinicians become critical thinkers. In their tutorial, the authors suggested that Browne and Keely's (2015) text, *Asking the Right Questions: A Guide to Critical Thinking,* be used specifically for applying argument analysis within the teaching context of communication science and disorders. Finn et al. believed that Browne and Keely's model was easily adaptable to both classroom and clinical teaching environments. Essentially, Browne and Keely's method for applying argument analysis is characterized by asking 10 questions. Finn et al. further categorized the 10 questions into two categories related to evaluation and interpretation of content. Table 1 lists the 10 questions by Brown and Keely as categorized by Finn et al. according to the goal of evaluation and interpretation.

Similar to argument analysis, Socratic questioning is intended to promote a deeper understanding of content by asking open-ended questions that dispute conventional beliefs and assumptions (Pang, 2008; Toledo, 2015). Similarly, application of Socratic questioning in the field of medicine typically seeks to uncover what the learner knows, but "more importantly, it exposes faulty reasoning and what the learner does not know" (Oh, 2005, p. 538). Toledo (2015) emphasizes the importance of posing Socratic questions in a safe learning environment that encourages learners to actively participate in discussion and explore challenging topics (Toledo, 2015). Finn et al. (2016) suggest asking Socratic questions that encourage the learner to take an "alternative perspective" (p. 60). Similarly, Toledo provided examples of Socratic questions that target assumptions (e.g., What can you assume instead?), perspective (e.g., What would some who disagree say?), and clarification (e.g., What do you mean by…?; p. 276).

Socratic questioning and argument analysis approaches tend to focus on asking questions that disable cognitive biases that lead to poor decision making, clinical

Table 1. Browne and Keely's (2015) 10 critical thinking questions.

Goal	Question
Interpretation	1. What are the issue and conclusion?
	2. What are the reasons?
	3. What words or phrases are ambiguous?
	4. What are the assumptions?
Evaluation	1. Are there fallacies in the reasoning?
	2. How good is the evidence?
	3. Are there rival causes?
	4. Are the statistics deceptive?
	5. What significant information is missing?
	6. What reasonable conclusions are possible?

Note. From *Asking the Right Questions* (11th edition), by M. N. Browne & S. M. Keeley, 2014, New York, NY: Pearson Education, Inc. Copyright 2014 by Pearson Education, Inc. Reprinted with permission.

error, and flawed beliefs (Finn et al., 2016). Hausmann and Schwartzstein (2018) specifically address using questions to disable cognitive biases, such that medical error is reduced. Both argument analysis (Browne & Keely, 2015) and Socratic questions (Toledo, 2015) share similarities with posing strategic questions at Bloom's (1956) highest cognitive processing levels. All three approaches intend to tap into analytical and evaluative processes involved with critiquing evidence or examining theoretical inconsistencies. In view of the common themes across all three of these approaches, this again may provide some supportive evidence for the generalizability of these approaches across disciplines. It may also provide some insight into the effectiveness of implementing strategic questioning models that are theoretically based upon asking higher order questions.

Learner-Generated Strategic Questioning Approaches

While historically the use of questioning in a teaching environment has focused on the educator posing questions, some evidence has supported the use of learner-generated strategic questioning approaches (Bowker, 2010; Hausmann & Schwartzstein, 2018; Tofade et al., 2013; Wilson & Smetana, 2011). Bowker (2010) argued that learner-generated questioning approaches reduce reliance on the educator to "catalyze inquiry" (p. 127). Learners who depend on the educator to formulate the most salient, thought-provoking questions are less likely to become "independent thinkers" (p. 127). Similarly, Hausmann and Schwartzstein (2018) also suggested that asking learners to construct their own questions and answers may boost self-directed learning habits and promote critical thinking. As addressed in Tofade et al. (2013), Wilson and Smetana (2011) discussed a learner-generated questioning strategy whereby the learner uses both questioning and metacognitive strategies as tools to respectively comprehend and monitor mastery of content material. Questions are used as thinking out loud frameworks to make the learner's thinking processes more explicit. For example, a learner may ask, "Do I understand this concept?" Wilson and Smetana's (2011) question as thinking approach provides some supportive evidence that learner-generated questioning approaches require training. In order for students to ask appropriate, thought-stimulating questions, the learner must be able to self-reflect, self-assess, and thus be self-aware. In addition, it may also be argued that the learner may require at least some basic foundational knowledge of the subject matter in order to ask questions that will be productive in learning. Learners who do not demonstrate basic foundational knowledge in a subject area may not know what kinds of questions to ask or how to ask them. Perhaps then, in some cases, clinical educators might consider the application of learner-generated questions in situations whereby the learner has demonstrated at least some foundational knowledge and skill within a subject area and shows the ability to self-reflect. For example, in applying self-generated questioning approaches to hierarchical approaches, such as the SQF model, educators may withhold having

the learner self-generate questions until the learner's needs and skill level are gauged to be appropriate to ask productive questions. In some instances, learner-generated questioning may thus be more appropriate for situations in which a learner is gauged to be appropriate for questions pertaining to Bloom's (1956) highest cognitive domains.

Five-Step Microskills of Clinical Teaching Model, Also Known as the One-Minute Preceptor Model

Neher et al. (1992) described a specific clinical teaching model intended to be used in medical training, called the *five-step microskills of clinical teaching model*, later more commonly known as the *one-minute preceptor model* (Neher & Stevens, 2003). The model is based on Koen and Vivian's (1980) work in identifying the major microskills involved in effective clinical teaching. It was intended to provide medical preceptors with an effective clinical teaching framework that could be implemented in 5 min or less using five steps (Neher et al., 1992, p. 420):

1. Get a commitment.
2. Probe for supporting evidence.
3. Teach general rules.
4. Reinforce what was done right.
5. Correct mistakes.

Strategic questioning is specifically described in Steps 1 and 2. In Step 1, the learner is encouraged to make a diagnostic commitment and presents the facts about the clinical case. The medical preceptor's strategic questions are composed of asking what the learner thinks about the presented information (e.g., What do you think is going on?) rather than asking questions that seek additional data gathering (e.g., When did the chest pain start?). The intention is that the preceptor's questions should facilitate the learner to problem solve the information versus steering the learner through the preceptor's problem-solving processes. Interestingly, much like self-generated questioning strategies, strategic questioning in Step 1 is intended to facilitate self-directed learning and critical thinking. In a sense, Step 1 questions are placing the onus of problem solving on the part of the learner. In Step 2, strategic questioning is composed of asking the learner for evidence that supports the diagnostic commitment in Step 1 (e.g., What prevented you from making that diagnostic choice?). Again, the intent of the questions is to foster self-directed learning and problem solving. Similar to the SQF model, which includes the synergistic combination of both strategic questioning and feedback, Steps 3–5 of the five-step microskills model focus on preceptor teaching and feedback. A follow-up study completed by Aagaard, Teherani, and Irby (2004) found positive outcomes associated with the implementation of the model with ambulatory care precepting. Most recently, Gatewood and DeGagne (2019) completed a systematic review that also supported its effectiveness and potential use within advanced practice nursing,

thus increasing the available evidence for generalization across clinical disciplines.

Other Strategic Questioning Approaches: Four Questions Technique and Questioning Circles

Additional strategic questioning approaches reported in the literature have included the four questions technique (Dietz-Uhler & Lanter, 2009) and questioning circles (Christenbury & Kelly, 1983; Tofade et al., 2013), both of which aim to encourage deep thinking and a self-directed style of learning. Both approaches encourage the learner to reflect and analyze the material with a focus on exploring the learner's perceptions and reactions. The four questions technique also includes the component of learner-generated questions, which is intended to further support active learning. The four questions technique also includes the component of learner-generated questions, which is intended to further support active learning. The questions developed by Dietz-Uhler and Lanter (2009, p. 39) can be adapted to suit the relevant clinical teaching topics.

Tofade et al. (2013) used Christenbury and Kelly's (1983) questioning circles as a framework for asking strategic questioning within a clinical teaching environment pertaining to pharmacy. Christenbury and Kelly's (1983) questioning circles emphasize a "nonsequential and overlapping" approach to questioning in order to provide a "logical, yet flexible format for questioning" (p. 12). Questions are conceptually formatted based on a Venn diagram (see Figure 1) whereby three interconnected circles represent the following: (a) subject matter (topic of discussion), (b) personal reality (relationship to learner's experiences, values, and ideas), and (c) external reality (relationship to external sources, other disciplines, and perspectives; Christenbury & Kelly, 1983, p. 13). Although questioning circles is not considered to be a hierarchical questioning approach, it shares some additional commonalities with other hierarchical questioning approaches, whereby questions are intended to guide the learner from superficial (questions based on the parts of the circle that do not overlap) to dense comprehension of the subject matter (questions based on the parts of the circle where all three domains overlap; Tofade et al., 2013). Learner experience level should also be considered when designing question types. An example of how questioning circles may be implemented within a health care clinical teaching context using the topic of *oral care* is demonstrated in Figure 1.

Promoting Effective Strategic Questioning

A review of some of the available strategic questioning approaches has begun to unravel the complexities involved with effective selection and implementation of an approach. Clinical educators in speech-language pathology and audiology are faced with the twofold conundrum of (a) how to select a strategic questioning approach and (b) how to determine its effectiveness. Further research is most certainly needed to determine the most effective strategic questioning approach(es). However, existing evidence may provide at least some insight into how to increase the likelihood of an effective approach. Specifically, consideration for some of the commonalities reported in the literature and across approaches may assist clinical educators with maximizing the teaching–learning environment.

Scaffolding Difficulty Level and Question Type

Scaffolding strategic questions according to level of difficulty, as described in some of the hierarchical approaches, may assist with effectively adjusting learning to the needs and skill level of the learner. Oh (2005) eloquently described this process when he described using questions to "diagnose the learner's level of understanding to assess his/her learning needs" (p. 538). Asking only questions well below or above the learner's knowledge and skill level without customization to the learner's needs may hinder teaching–learning goals. Posing challenging questions that the learner is not prepared to respond to may create learner frustration, poor motivation, and low confidence and emphasize the power dichotomy between the educator and learner. On the other hand, posing only low-level questions may not permit the opportunity for the learner to be challenged, thus halting the development of appropriate knowledge and skills.

Higher order strategic questions are necessary for stimulating critical thinking but require logical strategic scaffolding. In fact, some higher order question types, such as those that address cognitive bias and faulty reasoning, may be considered crucial to developing sound clinical skills. Evidence has shown that cognitive biases often lead to poor clinical judgment and clinical error (Finn et al., 2016). Most clinical educators would agree that providing opportunities for learners to recognize cognitive biases would be an integral component to the clinical learning environment. However, haphazardly posing these essential higher order question types without logical sequence may neutralize the development of deeper thought processes. Questioning approaches that both systematically develop complexity level and use questions to diagnose the learner's needs may be more generalizable across learners and learning contexts. Clinical educators may therefore play a critical role in both strategic selection and sequencing of question types.

Frequency and Timing

Rapid-fire questioning techniques or asking too many questions can lead to an unproductive teaching–learning environment. Literature has suggested that asking too many questions may lead to passive learning and prevent the learner from engaging in collaborative discussion (Brualdi, 1998; Tofade et al., 2013). Similarly, timing may also play an important role in strategic questioning. Permitting time for the learner to process the question and formulate a potential response may assist with encouraging self-directed learning and improve the quality of the response (Rowe, 1986; Tofade et al., 2013).

Focus on Self-Directed Learning and Self-Reflection

Some of the approaches discussed specifically address active learning and self-reflection. For example, learner-

Figure 1. Conceptual framework for applying questioning circles in a health care clinical teaching context.

Superficial Questions:	
Subject Matter	How does oral care reduce risk for aspiration pneumonia?
Personal Reality	Under which circumstances have you used oral care as a part of your clinical practice?
External Reality	What does the external evidence suggest about oral care reducing risk for aspiration pneumonia?
Deeper Questions:	
Subject Matter + Personal Reality	In your experience, has the use of oral care resulted in reducing aspiration pneumonia? How do you know?
Subject Matter + External Reality	What policies/protocols regarding the use of oral care at your facility should reduce the risk for aspiration pneumonia?
Personal Reality + External Reality	From your experience, what obstacles prevent the practice of evidence-based recommendations regarding the use of oral care?
Dense Question:	
Subject Matter + Personal Reality + External Reality	From your experience, how would policies/protocols at your facility help to overcome the obstacles of translating evidence-based recommendations regarding oral care into actual practice? And, ultimately, will that result in reducing aspiration pneumonia?
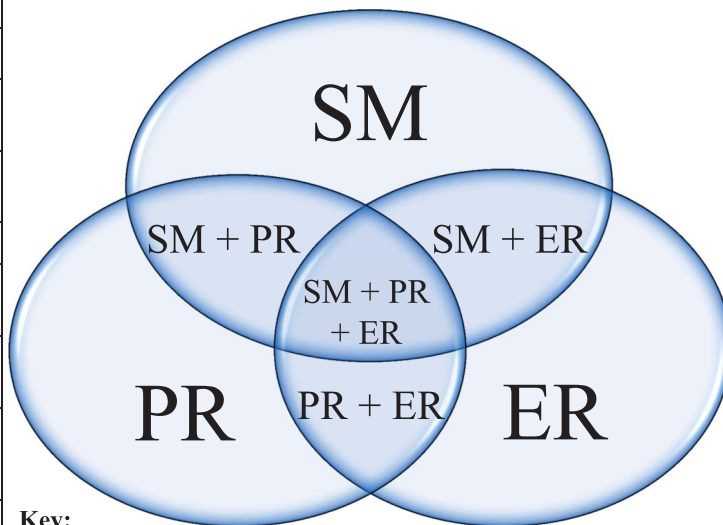
Key:
Subject Matter (SM)
Personal Reality (PR)
External Reality (ER)

Note: Questioning Circles was a concept in *Questioning: A Path to Critical Thinking*, by L. Christenbury & P. P. Kelly, 1983, published as an ERIC document – the national information system sponsored by the US Office of Education.

generated questions, five-step microskills model, four questions technique, question circles, and even philosophically driven approaches all encourage the learner to self-direct problem solving and acquisition of knowledge. Many approaches emphasize the importance of the learner thinking out loud as a means for encouraging self-assessment and self-reflection. Within the field of pharmacy, Medina, Castleberry, and Persky (2017) emphasized the significance of asking metacognitive questions to promote self-reflective skills. The authors provided a series of example questions, such as "What did you learn about yourself today regarding the subject area?" (p. 8). For some learners, this process of thinking about thinking may be more transparent and, for others, less so. Clinical educators should be aware that, in order to successfully accomplish an environment of self-directed learning, some explicit learner training may be needed. Strategic questioning can certainly be used as both a diagnostic and a treatment tool to facilitate learner needs and thus self-directed learning and self-reflection.

Setting a Positive Environment

Asking and responding to challenging questions may be maximized in an environment that is gauged to be psychologically safe (Tofade et al., 2013; Toledo, 2015). Many strategic questioning approaches, including Socratic questioning, discuss the importance of humility in asking questions (Toledo, 2015). Creating a safe environment may include how questions are phrased. Toledo (2015) suggests softening Socratic questions by removing "you" messages

in questioning. Toledo provides the example of changing the question, "What are you assuming?" to "I am wondering what assumptions might be…" (p. 277). Oh (2005), in his application of the Socratic method to medical teaching methods, stated, "We must be careful not to subject the learner to humiliation or fear of the learning process" (p. 539).

Hierarchically sequencing more challenging questions, as described in the SQF model, may also assist with learner confidence and set the tone for a safe teaching–learning environment. One may postulate that asking a series of lower level questions to substantiate learner confidence prior to asking higher level questions may assist with developing self-efficacy. This is contrary to a method used in medical training, called *pimping*. Pimping questions refers to asking a series of rapid-fire difficult questions that the medical student or resident is unable to respond for the intention of establishing hierarchy (Detsky, 2009). Pimping questions creates a power dynamic between the learner in training and the trainer, typically the attending physician. Some evidence has suggested that this style of teaching may create a hostile teaching–learning environment that reduces confidence and motivation and promotes fear of learning (Oh, 2005; Tofade et al., 2013).

Clinical Educator Training and Self-Assessment

As Neher et al. (1992) simply stated, "clinical teaching skills are not innate" (p. 419). Most clinical disciplines,

including speech-language pathology and audiology, have recognized the significance of formalized clinical education training (American Occupational Therapy Association, n.d.; American Physical Therapy Association, n.d.; ASHA, 2016; Kilminster, Cottrell, Grant, & Jolly, 2007; Procaccini, McNamara, & Lenzen, 2017). The field of medicine has long established that formal clinical teaching training improves learning outcomes (Bazuin & Yonke, 1978; Greenberg, Goldberg, & Jewett, 1984; Neher et al., 1992). Selecting and implementing strategic questions appropriate to both the learner's needs and learning context may be a good example of why clinical education training is necessary. As mentioned previously, evidence clearly shows that educators of all disciplines more frequently ask lower order questions in a teaching–learning context (Barnum, 2008; Cook et al., 2019; Ertmer et al., 2011; Irby, 1995; Phillips et al., 2017; Sellappah et al., 1998). There may be many reasons for this, including lack of clinical education training, lack of awareness, and even lack of critical thinking on the part of the educator. Regardless of the reason, it means that clinical educators need to self-assess, self-reflect, and engage in ongoing professional development. Hausmann and Schwartzstein (2018) proposed faculty development workshops and peer-to-peer assessment for improving the effectiveness of questioning in a medical teaching–learning environment. Clinical educators who hold some advanced knowledge about the theoretical underpinnings that underscore the art of asking the right questions may help to catalyze learners to being better clinicians. Clinical educators must also be aware of cognitive biases, expose faulty reasoning, and embrace systematic methods for determining effective clinical teaching. Self-assessment tools, such as the one provided by the Ad Hoc Committee on Supervision Training (ASHA, 2016), may be an important first step in accomplishing better teaching–learning outcomes. Just as students need to think about thinking, clinical educators need to think about clinical teaching.

Concluding Remarks

Certainly, further evidence is needed to investigate the effectiveness of specific strategic questioning approaches within the scope of speech-language pathology and audiology. Much of the current available research investigating strategic questioning approaches has been conducted in clinical fields outside speech-language pathology and audiology. However, the current available evidence provides clinical educators of all disciplines some insight into the value of mastering the art of asking questions. To summarize, the current available evidence suggests that effective implementation of strategic questioning in a clinical teaching–learning environment has the potential to

1. expand learner knowledge and skill acquisition;

2. stimulate critical thinking and other higher order thinking processes;

3. develop learner awareness of cognitive biases and faulty clinical reasoning;

4. diagnose and evaluate learning needs;

5. cultivate self-directed learning, self-assessment, and self-reflective practices; and

6. develop a positive, synergistic teaching–learning dynamic between the educator and learner.

Last, clinical educators must also continue to engage in self-directed, self-assessment, and self-reflective practices. Clinical educators need to be critical thinkers when posing questions within a teaching–learning environment. Questioning haphazardly without intentionality may disrupt the synergistic teaching–learning dynamic, thus stunting the development of sound clinical practices. Increasing the awareness of the theoretical underpinnings and complexities involved with asking questions and engagement in professional development will hopefully, at least in part, assist with securing a more productive and successful teaching–learning environment.

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