ABSTRACT: 

**Purpose:** Just as clinicians employ evidence-based practice, educational programs should be based on evidence showing their efficacy. Asking questions about the best approaches is a precursor to advancing pedagogy. 

**Method:** Evidence from studies of education and learning are reviewed to address the following questions: Do instructors and students have different purposes for education? Does the purpose affect the development of learning skills? Are students asking the right questions about their learning? How can we maximize the development of critically thinking clinicians? 

**Results:** An extensive literature shows that instructors can take steps to maximize the extent to which students employ deep-learning strategies. Further, a reflective-practice model of curriculum design can be more effective in fostering student understanding and transfer of insights to new settings than the traditional theory-first model that is common in the field of communication sciences and disorders. 

**Conclusion:** Does our curriculum need to be redesigned so practice comes before theory? Should students be given specific instructions on how to do therapy initially? Will doing so foster earlier development and refinement of critical thinking skills? Are students asking the right questions to become critical thinkers and to improve their approaches to learning? Could asking these questions lead to studies testing assumptions and enhancing evidence underlying our pedagogy?

**KEY WORDS:** deep learning, critical thinking, fixed-entity learning, reflective practice
the past 40 years, there has been a significant movement toward course work that identifies explicitly the development of critical thinking skills (Paul & Elder, 2011). It extends critical thinking to the cultivation of graduates who are always seeking logic and evidence in the decisions of both their vocations and their lives.

Although there is a great number of books devoted to techniques and evidence for fostering critical thinking, one of the most popular has been Browne and Keeley’s Asking the Right Questions (2014). As suggested by the title of this textbook, an essential theme throughout the critical-thinking literature has been to get students to ask effective questions about basic assumptions. Finn (2011a, 2011b, 2014) and Ng, Bartlett, and Lucy (2012a, 2012b, 2013) have been explicit in their attempts to incorporate the questioning approach to teach critical thinking to students in CSD and thus to foster the development of evidence-based practitioners. A purpose of the present article is to stimulate discussion on what are the right questions to ask about pedagogy in CSD and to encourage attempts to answer those questions.

The emphasis on evidence-based education across a number of disciplines has led many of us to believe that it is not good enough for an instructor to be knowledgeable of material and to present it effectively; traditional assumptions must be tested. To say that what has been done in the past is effective is not good enough: We must still question our assumptions to see what could be done better. For example, Barr and Tagg (1995) emphasized the need to be more conscious not of what is taught, but rather of what is learned and retained by the student. Weimer (2002) focused on putting learners at the center and allowing them to help drive the learning experience—again, the students are the ones deciding what questions to ask. As reviewed by Ginsberg et al. (2012), many of these approaches have been applied to improving student learning in CSD. This is a good beginning in the critical analysis of our educational programs. Yet, there are still many more questions to ask. In the spirit of evidence-based education, we must ask them in CSD.

This article addresses some of those unanswered questions. Specifically, have we designed our curriculum and educational practices in a manner that tests assumptions and maximizes learning? Questions are asked about student attitudes, student learning styles, how to get students to reflect on their approaches to learning and actively improve them, and how to best prepare students to be critical thinkers as they learn to ask the right questions as clinicians. Thus, this article analyzes different approaches to both our curriculum as well as the organization and identified learning goals for specific courses. For example, there is a traditional organization of the curriculum that has theory-based classes, such as phonetics and anatomy, preceding active learning with clinical material. Do students need this information first or would it be better to provide it later in the curriculum? Other questions addressed in this article relate to how to foster critical thinking at early stages in the curriculum. Specifically, does giving explicit directions on how to conduct treatment foster or hinder a student’s development of critical thinking in the clinic?

Attitudes About Learning

University instructors are motivated to prepare their students to become lifelong learners who apply critical thinking throughout their lives (Entwistle, 1984). As explained by Bain (2012), “Learning changes who people are and how they view the world. It makes them into better problem solvers, more creative and compassionate individuals, more responsible and self-confident people” (p. 90). Of course, college is also preparation for a meaningful career, but for the traditional model of liberal education, career preparation is imbedded in the general liberal arts and sciences experience.

In contrast to this overarching goal of the instructors, many entering students and their parents are pragmatists. They see college as a huge investment of time and money. Ferrall (2011) cited a 2007 study by Yankelovich that asked high school students and their parents about the purpose of college. Seventy-five percent of the students and 85% of the parents agreed with the statement that the purpose of college is that it “prepares students to get a better job and/or increases their earning potential…. The ultimate goal of college is to get a practical education and secure a first job…. Few people believe in the importance of: ‘learning for learning’s sake’ anymore” (p. 50).

In support of this, the most recent report to have dealt with this topic from the Cooperative Institutional Research Program at the Higher Education Institute at UCLA states that 88% of students entering college listed the primary importance of college as getting a better job (Pryor et al., 2012). This is an all-time high and is up from 68% when the study began in 1976. Making more money has moved up to 75%. Entering students reporting that they considered “to gain a general education and appreciation of ideas” is at 73%, which is close to where it was in 1976 (Pryor et al., 2012). Driscoll (2014) studied students in their second and fourth semesters in college and concluded that “findings reveal that for many students, vocationalism created a single-minded focus on student’s career preparation” (abstract). This may be
especially the case for students majoring in communication disorders, as they dream of a fulfilling career as a clinician—being a critical thinker may not yet be recognized as being as important. Thus, the lofty goals of a liberal education are now secondary to the desire for a better, more fulfilling, and lucrative vocation. For students and parents, the direct return on the college investment is critical; thus, instructors and students begin with a different attitude about their learning.

Although instructors often realize that students have different attitudes about learning that influence their approach to learning, it is easy for instructors to assume that students think like they do, or alternatively, to assume that students have the mature approach to learning that we would like them to have. As explained by Oblinger (2003), it is vital for instructors to try to understand students and to structure the learning experiences in ways that are most meaningful to them. Harris (2006) stated that students’ attitudes about why they are in school directly influence their behaviors and approaches to learning, and instructors need to be cognizant of this.

The Effects of Attitude on Approaches to Learning

Marton and Säljö (1976) grouped students’ learning styles on the basis of their attitudes toward learning. This work has fostered a number of subsequent studies showing that student attitudes, that is, students’ purposes for being in school, will determine their approach to learning and the effectiveness of instruction (Marton, Hounsell, & Entwistle, 1997). In reviewing their work, Bain (2012) explained three approaches: (a) surface learning, (b) strategic learning, and (c) deep learning.

Students who practice surface learning memorize facts, figures, and information in a form that reflects how it is presented and then give it back on an examination. In surface learning, the mind is viewed as “a mental filing cabinet” waiting to be filled (Bereiter & Scardamalia, 2005, p. 11). In surface learning, one does not try to evaluate or consider the information using any of the higher levels of analysis in Bloom’s taxonomy (Krathwohl, 2002) such as analyzing or applying what one has memorized. Even as early as 1932, Bartlett showed that this approach does not work well; that is, memory is not a reproductive storage system but depends greatly on a personal interpretation of the material (Bartlett, 1932). Students practicing surface learning focus on passing an examination, and they typically do not consider wanting to use what they have learned. In the spirit of thinking about asking the right questions, the fundamental question for surface learners is: “Will that be on the test?”

In contrast to surface learning, strategic learning is directly related to playing the larger education game. Strategic learning involves doing exactly what the instructor has requested. Following the strategies often seen in today’s millennial students, Howe and Strauss (2007) explained that such students are overly eager to please. They conform in every way and they do not question authority. They jump through all of the hoops that the instructor puts in front of them. When students practice strategic learning, they often get praise from instructors, parents, and other students. They love extra credit assignments, and they study grading rubrics with intent. The fundamental question for strategic learners is: “What do I need to do to get an A?” These students are serious and responsible. They do what they are told to do to get ahead in life.

Strategic learning often leads to the best grades, and the students who are obsessed with strategic learning are often the first students who are admitted to CSD graduate programs. These students’ focus is on building a record that will beat the competition for graduate admission. As explained earlier, these students do not pursue the larger purposes of getting an education. Strategic learning is common because it follows directly from both the student’s vocational purpose for being in college and the extrinsic reinforcements for strategic learning that are embedded in the design of undergraduate education. Unfortunately, as Bain (2012) asserted, if strategic learners learn anything meaningful to them, it is largely an accident.

Marton and Säljö (1976) explained that in addition to surface and strategic learning, there is deep learning. When students practice deep learning, they directly reflect the purpose of a liberal arts and sciences college degree. Like faculty members, deep learners have questions about life and the world around them, and their curiosity drives their learning and provides the primary drive for gaining a college education. Deep learning is trying to understand the meaning behind every lecture and every text. Deep learning pushes behaviors up the levels of Bloom’s taxonomy to analyze arguments, apply them in new places, and create solutions to problems. In deep learning, education is not memorizing or learning content material; rather, it is developing and honing the tools that enable them to continue to learn more. When students are seeking the answers to their own questions, they remember the answers better (Alfieri, Brooks, Aldrich, & Tenenbaum, 2011). The most defining aspect of deep learning is that the students are the ones with the questions. If the questions are meaningful to them, they are asking the right questions.
Deep learning is related to a concept reviewed by Ambrose, Bridges, Lovett, DiPietro, and Norman (2010) called far transfer. Far transfer is the application of what one is learning to a new place or situation. When the application is close to the context in which the material was presented, it is referred to as near transfer. The transfer is far when the application is unrelated to the original class experience. As Ambrose et al. (2010) pointed out: “Far transfer is, arguably, the central goal of education: we want our students to be able to apply what they learn beyond the classroom” (p. 108).

Both surface and strategic learners are poor at far transfer, and it is not uncommon for instructors to have students who claim that they do not remember material that was presented to them in a prerequisite course the preceding semester (Lang, 2013; Marton, Hounsell, & Entwistle, 1997). They do not remember because they were not seeking answers to their own questions. Fortunately, unlike surface and strategic learners, deep learners are great at far transfer because they are always applying and evaluating what they know. So, when instructors complain that students have not retained enough knowledge from a previous semester, they should blame themselves for not fostering enough deep learning.

**Fostering Deep Learning**

*Using reward systems to motivate deep learning.* As explained by Marton, Hounsell, and Entwistle (1984), the surface, strategic, and deep learning styles are situational. Even the students who take a surface approach to almost all of their classes can be motivated to act as deep learners if the situation is right; that is, if they find a topic or hobby for which they are curious and want to know more for their own desire to understand. Clearly, many of today’s students practice a lot of deep learning, but one could argue that too often, the system motivates students to concentrate primarily on acing the classes and getting admitted to graduate school; learning is secondary. Of course, it does not need to be a dichotomy, as one would like to have both deep learning and straight A students. But the rewards of our educational system can make strategic learning overshadow deep learning. What do we know about reward systems in education?

In discussing student rewards, McKeachie and Svinicki (2006) reviewed the distinction between intrinsic and extrinsic motivators in higher education. They stated that “students who are intrinsically motivated engage in any activity for the value of the activity itself, rather than for an external reward” (p. 142). This sounds like deep learning as intrinsic motivation fosters conceptual understanding, creativity, involvement, and deeper processing (Pintrich & Garcia, 1991). In contrast, extrinsic motivators are test scores, grades, approval, and other sources of recognition.

Although both intrinsic and extrinsic motivators are useful, it is too easy for students to over-interpret extrinsic rewards and think that they have fulfilled the learning objectives of a course because they received an A. Although some studies have shown that extrinsic rewards can take focus away from motivating deep learning (Ryan & Deci, 2000), McKeachie and Svinicki (2006) explained that other studies support a judicious use of extrinsic rewards to complement the development of intrinsic motivation. The larger point is that instructors control the reward system of a course, and if they increase explicit recognition and understanding of intrinsic rewards, they can stimulate more deep learning. Each instructor should be asking the question: How can I build more intrinsic motivation into my courses in order to cultivate more deep learning in my students?

Many students begin their college education focused on surface and strategic learning, but as they get closer to graduation, they become anxious to know how to do what will be expected of them in their future vocation: They want to know how to do the job. At first, they want an explicit list of steps for every job situation. They are becoming deep learners as they are motivated to find answers to questions they need, not just to do what is asked of them by an instructor. Yet, their approach is that of the surface or strategic learner; that is, “Give me the steps and I will follow them.” As instructors, one of our most important jobs is to shift students to more and more deep learning as they mature in their college experience and begin to ask their own questions. But the question remains, should we give students explicit steps? Once they try to follow explicit steps, they might quickly realize that they must begin to ask their own questions about each step.

Andreou, Papastavrou, and Merkouris (2013) provided an extensive review of learning styles in nursing students and related that to the development of critical thinking in the clinic. They found that although critical thinking was not recognized in most nursing programs, there were barriers to critical thinking in the theory-first curriculum as well as inadequate understanding of critical thinking by students and inadequate opportunities for socialization.
in critical thinking. Andreou et al. did find that critical thinking (a) could be learned through simulations and other preclinical activities, (b) would be manifest differently across students with different learning styles, and (c) fostered development of thoughtful and adaptive clinicians.

One might assert that the observations of Andreou et al. (2013) in nursing, and the earlier discussion about learning approaches, can be related to any vocation-based major. I have taught speech science to undergraduate majors for many years and, anecdotally, I have often observed the following. Typically, the students do not see the purpose for learning speech science, so they stay in the strategic learning mode. When asked what they would like to know, they indicate that they would like to know how to do therapy. Their question is specifically how to do the therapy process, not what the theory is. As they get closer to graduation, the more they want specific steps for therapy. They know that they will have to begin to do therapy as master’s students, and they want to memorize the steps to be ready. They often get specific steps in other classes; however, they also need hands-on experience in applying and interpreting these steps.

Overcoming misconceptions. The work of developmental psychologist Carol Dweck and her colleagues (Elliott & Dweck, 1988; Hong, Chiu, Dweck, Lin, & Wan, 1999; Mangels, Butterfield, Lamb, Good, & Dweck, 2006) offers insight into how a student’s attitudes about, and conceptions of, learning can affect their approach and thus their ability to learn. Some students believe that they are just naturally good or bad at some learning tasks. These are called fixed-entity learners, and their idea is that learning is a relatively stable skill. For example, one is either good at math or not, and that talent or lack of it is a fixed aspect of their intelligence. Other students realize that learning can be incremental. They believe that learning follows a developmental course and that if they work hard enough and long enough at something, even the most difficult skills can be learned.

Dweck and colleagues (Elliott & Dweck, 1988; Hong et al., 1999; Mangels et al., 2006) showed that children with an incremental approach to learning will develop a mastery-oriented response to challenging tasks. They work hard and become deep learners. In contrast, students with a fixed-entity approach to learning can acquire a sense of learned helplessness (Waitzkin, 2007). They assume that they are either good or bad at learning the skill and can do little about it. They believe that they are helpless to change their learning habits. Such students, even the most talented among them, are not inclined to develop into deep learners.

What can we do about this? Clearly, we need to be more explicit in reinforcing ideas that students can develop into better, deeper learners. Students need to begin to ask themselves the questions: “How can I become a better learner?” “What are my learning strategies, and are they based on evidence?” In addition, instructors can scaffold tasks that promote success so that they are hard enough to be challenging, but not so difficult that a student cannot succeed (Vygotsky, 1978); thus showing that even the least talented student can succeed with time and effort, but also and more importantly, demonstrating that learners can organize their own scaffolding and thus take control of their own learning.

Chew (2014) reviewed the evidence showing that many of today’s students have a number of misconceptions about the way learning works. For example, students tend to believe that learning can be, and usually is, relatively fast. Thus, they do not leave enough time to study material to a deep level of understanding. This underestimation of the time involved in learning may be related to the fixed-entity approach rather than understanding the time requirements of the incremental approach.

A second misconception reviewed by Chew (2014) is that too many students assume that knowledge is composed of isolated facts. Surface learners want to memorize the information. Doing so will better align with the previous misconception that learning is fast. A third misconception also related to being fixed-entity learners is that being good at a subject is a matter of inborn talent and is not necessarily related to hard work. This can often be debilitating as failures lead to less motivation to work hard instead of more determination to improve (Waitzkin, 2007).

The fourth misconception reviewed by Chew (2014) is that students think they are really good at multitasking. Although there may be many different levels on which to define multitasking, and some work well, such as talking while walking, in general, there is a significant body of evidence showing that multitasking always hurts performance in learning tasks (Sanbonmatsu, Strayer, Medeiros-Ward, & Watson, 2013). A student’s facility with multitasking can be an excuse for not doing the work to concentrate hard on the task at hand. Too often, students continue to multitask because they are not asking themselves if their learning strategies are effective and how they could be improved.

A final misconception is that students underestimate how important critical thinking is in deep learning, and they assume that they are good at it. In fact, many students do not understand what is meant by the term (Paul & Elder, 2011). What is critical
thinking? We know that mathematical problems can be laid out in a way that terms are defined and codified through explicit symbols and processes. These symbols and processes are arbitrary and specific to the system used; that is, in math, there are many different algebra systems. Just as mathematical problems can be analyzed, so can verbal arguments. Doing so is what is meant by critical thinking. Just as there are many algebras, there are many different systems, terms, and processes used for critical thinking. One of the most popular systems (Browne & Keeley, 2014) allows any verbal argument to be analyzed into an issue, the reasons to support the issue or not, the amount and quality of the evidence supporting the reasons, the ambiguities and assumptions involved in mapping the evidence to the reasons and the reasons to the issue, and the logical fallacies inherent in the structure of the argument.

Over the past few decades, many universities have had classes that teach critical thinking explicitly, and it is clear from these classes that students begin with significant misconceptions about how to analyze arguments; it can take a term or more of explicit work for them to develop skill at doing so (Paul & Elder, 2011). Much of the course work identifying critical thinking as the primary focus is in the general curriculum; however, both Finn (2011a, 2011b, 2014) and Ng, Bartlett, and Lucy (2012a, 2012b, and 2013) have advocated for course work that explicitly focuses on critical thinking in CSD.

Although the misconceptions about learning are well known, they are not typically considered explicitly in the design of student learning experiences. How often do we mention them in class? Do we do anything to try to overcome them or to improve student learning skills? Again, doing so would foster more deep learning, and conversely, students who are practicing deep learning would be intrinsically motivated to improve their learning skills. Of course, strategic learners might also wish to improve their skills in getting good grades.

**Reflective Practice and Deep Learning in Curriculum Design**

Schön (1983, 1987) studied the design of the curriculum across many different fields and developed two general approaches to the design of the overall educational experience: theory-first practice and reflective practice. Schön’s work generated a great deal of interest and resulted in a number of experimental tests of his ideas (Mann, Gordon, & MacLeod, 2009). Schön’s first approach is theory-first practice, which is commonly observed in many scientific disciplines. In theory-first practice, students first receive lectures on broad theoretical issues, then move to more specific theory courses; courses on the theory of how to practice are offered at the end of the undergraduate curriculum.

Many scientists are motivated by the thrill of generating and seeking insight into questions about the world around us. Yet, laboratory assignments for undergraduates in the sciences tend to be based on demonstrating already well-developed theory. The curiosity that drives scientists is missing from the traditional theory-first curriculum (Firestein, 2012). In many of the sciences with a theory-first curriculum, one must go to graduate school to learn the day-to-day activities of practitioners in the field. The curriculum does not drive undergraduate science students to move from surface or strategic learners to deep learners (see for example, Hay, Williams, Stahl, & Wingate, 2013). Their curiosity is not sparked. They are not asking the right questions. As a result, many students do not see the thrill that science has for the scientist. Although there are numerous explicit benefits to a major in the sciences, many students are turned off by their undergraduate experiences in the sciences and migrate away from majors in science.

As explained by Brackenbury et al. (2014), the field of CSD fits the theory-first model. Initially, students are exposed to theory in phonetics, anatomy, speech science, and language plus its development. Later, students take theoretical courses about each disorder and the theory behind different aspects of clinical practice. Hands-on clinical experiences are generally reserved for the master’s program. When students begin their first clinical experiences at the onset of the master’s program, they have little experience performing clinical activities, yet they are with actual clients who need quality services. There is not much room for the mistakes that typically occur when one begins to develop a skill. This can be intimidating to students.

The second approach to pedagogy explained by Schön (1983, 1987) is reflective practice. In reflective practice, the curriculum begins with practical experiences. There are hands-on activities, and initially, students are told explicitly what to do and how to do it. As students continue to get practice, they begin to make decisions and ask questions to try to inform their decisions. This is when they seek out theory because they see its utility; that is, they reflect on what they are doing and they are motivated to improve it—thus the term, reflective practice. This reflective curriculum leads to deep learning. For example, imagine an apprentice, even in the historical sense, beginning to do an activity. He or she starts with the most simple and structured activities. Slowly, the expectations of the apprentice are increased. The
apprentice has questions and seeks answers. Theory now takes on new meaning as it helps to generate the answers to the student’s own questions. The apprentice is asking the right questions; that is, reflecting and becoming a critical thinker and deep learner.

Reflective practice encourages deep learning. An easy way to think about Schön’s (1983, 1987) distinction is that theory-first practice concentrates on learning about something first before learning to do it, and before really caring about it, and reflective practice begins with learning how to do something as a motivator to deep learning about it. As stated by Mann et al. (2009), “The importance of reflection and reflective practice are frequently noted in the literature; indeed, reflective capacity is regarded by many as an essential characteristic for professional competence” (p. 595).

The extensive review by Mann et al. (2009) shows the efficacy of reflective practice in fostering deep learning and critical thinking in many disciplines (e.g., Boud & Walker, 1998; Glaze, 2001; Hattery, 2003; Hertzog & Williams, 2007; Moon, 2004). Furthermore, as pointed out by Wegner (1998), educational activities based on reflective practice enhance deep learning to the extent that they are explicitly social practices. Marton and Booth (1997) also showed that learning is facilitated when reflection is explicit to the extent that students become aware of their deep learning approach. Clearly, reflective practice is directly related to the development of the critical thinking skills of a clinician. As Finn (2014) and Ng et al. (2012a) pointed out, teaching critical thinking skills advances the development of our graduates as evidence-based practitioners.

Brackenbury et al. (2014) suggested that there are a number of changes that could be made in the CSD curriculum that would make it less theory first and more conducive to reflective practice. Brackenbury et al. are explicit in that instructors should design course work to facilitate the development of critical thinking skills. They stated: “Rather, it appears that there is a disconnect between the type of learning that we expect to take place in the classroom and the critical thinking skills that we expect of students in clinical settings” (p. 76). Giving all undergraduate majors the clinical experiences of master’s students is impractical and not what is being advocated. However, we can deconstruct the formal clinical process of the master’s program and move some practice-based components to the undergraduate curriculum.

Both Brackenbury et al. (2014) and Friberg, Folkins, and Visconti (2013) provide a number of explicit suggestions for facilitating clinical thinking skills in didactic courses, such as case studies, problem-based learning, video observation of clinical sessions, junior clinician partnerships, or client simulations (Tharpe & Zraick, 2014). Polovoy (2015) discussed how students can begin therapy experiences by working with actors who simulate disorders. Friberg et al. (2013) suggested that undergraduates work through a staged continuum of skill development beginning with video observation and discussion and progressing through a sequence of progressively less structured assignments and progressively less direct support. As students gain practice skills, they reflect on what they are doing and develop their own questions. They are then positioned to seek theory because they have their own questions and a need to know, not because they want a grade. This is the essence of deep learning. It will lead to far transfer, critical thinking in clinical decisions, and clinicians who care about the evidence base of their clinical work.

Following the suggestions of Friberg et al. (2013), I recently tried out an idea for giving students reflective-practice experience with research at a very early stage. I had nine first-semester, first-year students in an honors section of a much larger class, Introduction to Communication Disorders. All nine students were given the same research project, which involved using smart phones or tablets to measure the listening environment of university classrooms following the procedures offered by Folkins, Friberg, and Cesarini (2015). The students were told explicitly what to do and were given a recipe for how to do it. Each had to do an individual project, but they could collaborate with each other for help and advice. I gave the students ideas whenever they asked for guidance, yet they had to make a number of their own decisions about how to proceed. Although there were nine students, this turned out to be about the same amount of work for the instructor as one senior honors research project. This was because I gave the students the project instead of working with them to develop their own project, and all of the students did the same thing (as recommended by Friberg et al., 2013).

Although all nine students attempted to answer the same questions in the same way, and they collaborated with each other, there was great variation among the research reports that they submitted. These reports reflected their lack of knowledge about research and scholarly writing. They left great room for improvement. These students did not realize how poor the projects were as they had not had exposure to much theory, scholarly writing, or experimental design. They also had not been required to find an independent project on their own, which is often challenging for undergraduates. They had other students to collaborate with who were facing the same challenges. Thus, these students had not been discouraged by the things that are usually frustrating for beginning researchers. Yet, both during the project...
and afterward, they were required to reflect on and question what they had done and why. In this, they were thoughtful and creative.

One of the students disliked the project and dropped out. However, even though the projects were poorly done, interviews afterward reflected that six of the eight students loved the project. They enjoyed the practice of research. They started to reflect on this practice and ask questions that they thought they might wish to answer in the future. Some of them began to consider that they might want to be researchers. They now wanted to know more about theory and experimental design. Most importantly, they now had questions of their own about the topic and wanted to do more research in the area. These students were asking the right questions. They were becoming reflective research practitioners, critical thinkers, and deep learners.

A Vision of Starting With the Specifics of Practice, not Theory

Although CSD programs generally follow the theory-first structure, one could imagine a circumstance in which a program tried to develop a reflective-practice approach. In this case, the students would begin, probably sometime in the early years of the undergraduate experience, with very structured practice in performing different aspects of clinical activities and behaviors. They would be beginners, and unlike when master’s students get their first real clients, there would be a lot of room for the mistakes that beginners make. These beginners would need explicit and direct guidance. They would not have had much theory yet, so instead of being asked to use theory to plan activities, they would be told exactly what to do and how to do it. They might not be working with actual clients, but they would be getting practice in thinking like a clinician.

Along these lines, Kummer (2013) suggested that specific techniques for doing therapy should be taught initially; that is, students should be given a recipe. Then following Schön (1983, 1987), as students gain skill doing the specifically defined behaviors, they would begin to ask questions and seek the theory to modify and expand their therapy skills. They would be thirsty for new theoretical insights that they would learn on their own, without them being assigned. Students would spend more and more of their efforts in deep learning rather than in memorizing or repeating theories as they are told.

The recipe analogy can be useful because it invites comparisons to the development of a good cook. Cooking is often taught following reflective practice. Beginning cooks start with recipes and follow them explicitly. As they develop cooking skills, they build up an understanding of what is effective, and this allows, and even encourages, substitutions in a recipe as well as modifications and improvements. The new cooks begin to experiment and innovate. They ask questions and seek theoretical understanding to answer the questions. They are performing as deep learners. The deep learning reinforces itself in that many good cooks cannot resist changing recipes to fit their own styles and preferences; that is, if they use a recipe at all. So learning to cook follows reflective practice. It begins with a detailed list of steps that leads to critical thinking and deep learning. The recipes do not hinder creativity; they foster it.

Conclusion

In the spirit of evidence-based education, it is our obligation to develop hypotheses, test them, and demonstrate that our educational approaches are the best we know how to do. Are we doing enough to be cognizant of students’ purpose for getting an education and to understand how that affects their approach to learning? Are we taking steps to maximize deep learning? Are we working to make students aware that learning to be a good learner is a developmental process: that is, that the skill of learning is not a fixed entity? Can we work to dispel other misunderstandings about learning and would that make a difference for student learning? Should we reorganize our undergraduate curriculum and courses to build in more reflective practice? Is the common theory-first design of our curriculum the best approach? Are there practical ways to expose students to critical thinking about clinical issues at the earliest stages of the curriculum? Should we give recipe-like instructions to beginning clinicians? Would this lead to more deep learning? Are these questions the most important questions for educators to be asking?

Although affirmative responses to many of these questions are supported by the theoretical principles reviewed in this article, many of the questions have not been tested empirically, at least not in the field of CSD. Doing so will be an important challenge for our evidence-based disciplines. It will allow us to know if these are the right questions to ask as we endeavor to maximize deep learning and better prepare our students to be thoughtful and creative citizens of the world as well as the most effective evidence-based practitioners they can be.

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