

Examining Educational Challenges in Communication Sciences and Disorders From the Perspectives of Signature Pedagogy and Reflective Practice

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Professional programs at colleges and universities are faced with the complex problem of developing novice students, who have varying degrees of knowledge and interests,

into entry-level professionals. Virtually every discipline, including communication sciences and disorders (CSD), has aspects of its pedagogy that work well and others that are challenging for both education and

ABSTRACT: Purpose: Like other professional disciplines, communication sciences and disorders (CSD) is faced with challenges related to maximizing student development and meeting workforce needs. Challenges include the difficulty that students experience connecting classroom experiences to clinical practice, the stress that many students feel with their first clinical experiences, and the national shortage of practitioners. Ways to address these challenges through a theoretically based examination of common educational practices in the CSD discipline are suggested.

Method: Common educational practices in CSD were identified through the educational concepts of signature pedagogy (Schulman, 2005) and reflective practice (Schön, 1983, 1990). These common practices were then examined to determine if and how they may relate to challenges to the discipline.

Results: Current common educational practices in CSD fit with a theory-first signature pedagogy, although some programs are using reflective practice approaches. Considerations of CSD's signature pedagogy do appear to be useful for examining challenges in the discipline.

Conclusion: Five suggestions for moving toward a revised, practice-first signature pedagogy of CSD are discussed: Consider the impact of our signature pedagogy on challenges, make the signature pedagogy more explicit to students, incorporate evidence-based teaching, provide more undergraduate clinic experiences, and rely less on university clinics.

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the discipline in general. Presentations at the 2011 annual conference of the Council of Academic Programs in Communication Sciences and Disorders, for example, addressed a number of challenges that face our discipline with regard to student training. These include difficulties that students have connecting information between experiences, the high levels of stress that students feel preceding and during clinical training, and graduate programs' inability to meet workforce demands by producing enough entry-level clinicians (DeRuiter, 2011a; Hale & O'Connor, 2011; Ramachandran, 2011) (see also American Speech-Language-Hearing Association [ASHA], 1995, 2007, and Flahive, 2011). Despite numerous proposals and attempts to solve these challenges (e.g., DeRuiter, 2011b; Roush, 2011), they persist.

Although each educational and workforce challenge has its own unique features and solutions, there may be a contributing factor underlying all of them: our common educational practices. We provide a theoretically based analysis of this issue by addressing the following questions:

- Are institutional practices that programs in CSD typically employ to teach students, in both classroom and clinic settings, contributing to educational and workforce challenges?
- Can changes to our pedagogical practices help reduce these challenges?

The analysis begins with a description of the educational models of signature pedagogy and reflective practice and how the CSD's common teaching practices fit within them and compare to those of other disciplines. We then examine ways in which these forms of teaching may be related to each of the three challenges listed earlier. Finally, we explore the potential impacts that other forms of pedagogy, including those that are currently less prevalent within the discipline, could have on these challenges. Our purpose is to generate discussion among faculty members, students, and other constituents regarding current instructional practices in CSD. We offer suggestions that may enhance professional education and lead to research programs comparing the relative efficacy of such practices.

Educational Models: Signature Pedagogy and Reflective Practice

Different professions tend to have their own distinctive signatures for how they educate students. Shulman (2005) coined the term *signature pedagogy* to refer to the "types of teaching that organize the fundamental ways in which future practitioners are educated for their new professions" (p. 52). Signature pedagogy

is a broad description of the common educational practices that are used within a discipline and usually across the majority of university programs. It emphasizes the ways that students are taught to think and act like a practicing member of that field, as opposed to the curricular content that students must complete in order to graduate.

Signature pedagogies can be similar across disciplines or quite different (Cooke, Irby, & O'Brien, 2010; Sullivan, Colby, Welch Wegner, Bond, & Shulman, 2007). For example, the signature pedagogy of law school includes the case-dialogue method in which the professor calls on students to analyze a complicated appellate court case. Its emphasis is on developing students' abilities to think like lawyers, with relatively less concern for the day-to-day activities of practicing law. Medicine, in contrast, highlights the day-to-day decisions that physicians make in diagnosis and patient care through bedside and grand rounds experiences. Although both disciplines address theoretical and practical constructs, the differences in how they are balanced and the forms of their presentation are reflections of each discipline's signature pedagogy.

Shulman (2005) identified three primary dimensions to any signature pedagogy: surface structure, deep structure, and implicit structure. The *surface structure* is the operational organization of the learning experiences. It consists of the tangible structures, organizations, and methods of teaching and learning. It addresses questions like: How is the information being presented? What materials are being used? What are the students doing during the session? How is the instructor interacting with the students? The *deep structure* includes the assumptions that educators have about how to best impart the knowledge and know-how of the field. It is the *why* behind the actions of the surface structure. For example, why would one teaching method be more beneficial for student learning than another? The *implicit structure* reflects the principles of the discipline and prepares students to make value judgments as professionals. There is a symbiotic relationship between the values with which we teach and the values that we are conveying to our students through that teaching.

In a similar manner, Schön (1983, 1990) discussed how a profession's educational practices can shape the abilities of its practitioners. Although Schön wrote two decades before Shulman's (2005) work, he contrasted two different views that appear to relate to the surface and deep structure of signature pedagogies. Schön's first view is *theory-first practice*. As the name suggests, theory-first disciplines address and emphasize foundational theoretical information prior to topics related to professional practice.

The alternative method, named *reflective practice*, engages students in hands-on experiences early and addresses theoretical constructs as they relate to these experiences. Schön proposed that theory-first practices worked well for professions in which the majority of decisions were analytic, logical, and consistent. He suggested that reflective practices, on the other hand, were more appropriate for educating practitioners in fields that require judgments involving complexity, uncertainty, instability, uniqueness, and value conflicts.

The Signature Pedagogy of CSD

Although multiple books and papers have described the signature pedagogies of other professional disciplines (e.g., Chick, Haynie, Gurung, & Ciccone, 2012; Gurung, Chick, & Haynie, 2009), this is the first published attempt to delineate the signature pedagogy of CSD. There have been many articles published about teaching practices within individual courses in CSD, yet we found none that collected comparative data or made generalizations across programs. This is not unusual, as neither Schulman (2005) nor subsequent authors have reported specific data within their descriptions of disciplines' signature pedagogies. Likewise, there are no specific measures defining how pervasive educational methods need to be used in order to be considered part of a signature pedagogy.

The goal of this section is to provide viewpoints about common teaching practices across CSD. The statements made here are based on our own experiences as faculty members, administrators, and associates with university centers for teaching and learning as well as on discussions with faculty members at programs around the country. The views expressed here are intended as starting points for the examination of potential connections between our most

common teaching practices and educational challenges in the discipline, rather than a definitive measure of the discipline's signature pedagogy. These views address issues across the full range of educational experiences that our students receive (at the undergraduate and graduate levels and in classroom and clinical settings) because it is the whole of these experiences that develop students into professionals. Table 1 contains the frameworks of signature pedagogy and practice type along with an overview of the discipline's current common educational practices.

The surface structure of CSD is formed by the methods used for instruction and the sequence of classroom and clinical experiences. Courses in our discipline are often taught in the traditional manner, by the instructor providing lectures to the class, out-of-class assignments, and assessment through quizzes and tests. Because many instructors in our discipline have backgrounds in clinical practice, lectures often include case examples from past clinical experiences.

A common sequence of classes and clinical experiences begins with an introductory course about the discipline. Students quickly go on to a skills-oriented course in phonetics, background courses in basic science, and overview courses in communication skills and development. Undergraduate programs are often completed with classes on the assessment and treatment of communication disorders, a course on clinical methods, and observations of practicing clinicians. Although some students receive hands-on clinical experience at the undergraduate level, observation hours are as close as many undergraduates get to working with clients. In contrast, many graduate programs quickly immerse students in clinical work while they take courses on specific communication disorders across the scope of practice.

Table 1. Associations between aspects of signature pedagogy and reflective practice with communication sciences and disorders' current common educational practices.

<i>Educational model</i>	<i>Current common educational practices</i>
Signature pedagogy	
Surface structure	Traditional methods including lecture, homework, and tests. Course sequence that emphasizes theory before practice. Limited client contact, primarily observation, until the graduate level.
Deep structure	Theory precedes practice. Minimal need for supervision just after master's degree.
Implicit structure	Importance of communication to all people. Meeting the individual needs of each client. The desire to maximize client outcomes.
Practice type	
Theory-first practice	Course sequence that emphasizes theory before practice. Limited client contact, primarily observation, until the graduate level.
Reflective practice	Instructional practices such as learner-centered teaching, problem-based learning, and service learning.

Graduate students' clinical work typically begins in a university clinic under the individual supervision of faculty and/or university-based clinical supervisors. Later, there will be clinical placements and the relative independence of the postgraduate clinical fellowship.

The deep structure of CSD is predicated on the idea that students should be well versed in theoretical constructs before they can be involved in clinical activities. As a result, our discipline follows the surface structure sequence outlined above and fit Schön's (1983, 1990) theory-first model. Likewise, we desire graduating clinicians to be able to work in a professional setting immediately, with a wide variety of client types and only a modest need for further supervision. Clinical training is a building process that usually begins with one-on-one mentorship from faculty supervisors in controlled university clinics and progresses to experiences with one or more practicing speech-language pathologists (SLPs) or audiologists in off-campus clinics.

The implicit structure of education in CSD reflects our values and prepares students to make value judgments as professionals. As a discipline, we value features like the importance of effective communication for all people, the individual needs of each client, and the desire to maximize client outcomes (e.g., ASHA, 2010a). One intent of CSD programs is that students learn and project these professional values to clients, families, and the public. Students must also learn to interact with other professionals and gain experience with complex, value-laden choices, such as who should receive services. Together, these features of the discipline's implicit structure help students graduate with the knowledge and skills that extend beyond just following standard clinical procedures, allowing them to practice as full professionals.

It is important to note that there are faculty members and university programs in CSD that do not completely follow this educational model. Posters and presentations within the topic area of scholarship of teaching and learning at recent ASHA conventions, for example, included reports by faculty members who use nontraditional teaching methods such as learner-centered teaching, problem-based learning, and service learning. Likewise, there are programs that include students in clinical experiences early in their undergraduate program, and others that do not have university-based clinics. We acknowledge these forms of teaching within the discipline. We do not, however, consider them to be part of our current signature pedagogy because they are not used by a majority of instructors across the majority of programs.

Comparisons With Other Disciplines

Further understanding of the common teaching practices of CSD can come from comparing and contrasting these practices with the signature pedagogies of other disciplines, especially those that follow different signature pedagogies and reflective practices. For example, some aspects of the surface structure of CSD and music are similar. In both fields, practicum experiences occur with the student working directly with a faculty supervisor, predominantly in a one-on-one setting. CSD students see clients individually under the watchful eye of a supervisor; similarly, music students have their private lessons with a music teacher. Even though students in both disciplines may engage in group activities such as clinical teams or orchestral ensembles, they take their direction from their supervisor, not from other students. This contrasts with the signature pedagogy of areas such as architecture or studio art, where students produce work in an open environment and receive significant stimulation and feedback from other students as well as their instructors.

In addition to similarities in the surface and deep structures of our signature pedagogy and that of music, there are also significant differences. The learning of theory, for example, occurs in these disciplines at almost nearly opposite times in the educational sequence. Music students begin their education with intensive concentration on practicing to make music and early public performance. Music theory is taught at the undergraduate level, but it is clearly secondary and comes after years of concentration on performance abilities that often began at an early age. This is the opposite pedagogy from CSD in which there is a thorough grounding in theory prior to individual performance experiences. In other words, music is a reflective practice, whereas CSD is a theory-first practice. These surface-level practices reflect the deep structure assumptions of each field: Music pedagogy emphasizes the quality of one's musicianship over explanations of why such phenomena are important, whereas CSD's pedagogy promotes clinical practice and problem solving that is scientifically valid.

Another difference between the pedagogies is that music students have many periods of hands-on practice (with and without oversight from an instructor) that are punctuated by public performances. These public performances are judged by expectations relative to the student's level of maturity. In contrast, CSD students have the bulk of their clinical experiences, which are analogous to public performances in music, with actual clients. A primary difference here is that students in CSD traditionally get limited practice experience before working with their first

clients. A second difference is that although both student groups are judged by their levels of experience, students in our discipline must meet minimum professional standards and expectations from the start. It is important that the clients who are seen by beginning students receive services that are just as effective and appropriate as those delivered by an experienced clinician. For example, student clinicians must maintain clients' confidentiality, deliver services without discrimination, and document and evaluate the services they provide (ASHA, 2010a).

Although there are many commonalities between education in CSD and other allied health disciplines (like physical therapy or occupational therapy), there are some important differences here too. In CSD, students often receive initial clinical experiences in stand-alone university clinics, and their primary input comes from university supervisors. In contrast, universities do not typically have separate clinics for physical or occupational therapy, unless the university has a medical school and the clinics are integrated with a teaching hospital. Instead, most initial placements are in hospitals and other offsite clinical facilities (American Occupational Therapy Association, 1999). As an integral part of their undergraduate education, these students receive input from their faculty supervisors, the clinicians assigned to them at the clinical site, and other professionals indigenous to the hospital or clinic with whom they interact.

Examining Potential Connections Between Our Common Educational Practices and Challenges to the Professions

We examined three current educational and workforce challenges to the discipline to determine if they are influenced by our common educational practices: students' difficulty in connecting information within and between classroom and clinical experiences, the high levels of stress that students feel preceding and during clinical training, and problems with graduate programs' abilities to meet workforce demands by producing enough clinicians. These issues were chosen as exemplars of the broader pool of challenges that the discipline faces because they are challenges that have been discussed at national forums and have been directly experienced within each of the authors' work with undergraduate and graduate students.

Students in undergraduate programs frequently demonstrate difficulty with the recall and use of knowledge and skills from one class to another and from the classroom to clinical experiences. The theory-first structure of CSD is a segmented, bottom-up model. It is predicated on the transfer of learning

from one experience to another but does not necessarily provide a clear mechanism for such transfer. Curricular sequences, for example, are designed so that information from earlier courses contributes to learning in later academic work (e.g., courses on phonetics typically precede those on speech sound disorders, which occur before those on clinical instruction); theory-based courses occur before practice-based; and lecture-based content delivery initially dominates over direct clinical experiences. In other words, the knowledge and skills to be a professional are taught in separate courses that are intended to build on each other, but students are often unable to see the connections that faculty believe they are creating. Thus, our signature pedagogy may be contributing to this disconnect because it provides students with only a part of the whole at any given time. Students learn basic theory without parallel clinical theory and clinical theory without parallel clinical experiences to anchor and apply the theory. As a result, students tend to forget information and miss valuable connections between their curricular experiences. These students are missing out on what are considered to be important features of the surface and deep structures of our signature pedagogy.

Majoring in CSD can be stressful to students because they have committed themselves to career paths in which they have few direct experiences for building professional confidence or knowing that clinical work is appealing to them. Graduate school is particularly stressful because students with little clinical experience quickly enter into an intensive schedule of clinical work that must meet standards of professional practice from the start. This, in turn, may cause students to increasingly desire supervisors and course instructors to tell them exactly what to do. When faculty members and clinical supervisors emphasize problem solving and disciplined creativity over precise answers, students' anxiety can be heightened. The theory-first aspects of our signature pedagogy may be contributing to this stress by holding direct clinical experiences until late in the educational process. For undergraduates, this delays their experience of the implicit values of the discipline, and at the graduate level, it becomes yet another layer of knowledge and skills that must be implemented immediately.

The third challenge is the discipline's inability to meet current and future job demands (ASHA, 2006). It has been projected that 5,800 jobs in audiology and 43,800 in speech-language pathology will be unfilled between the years 2008 and 2018 (Robinson, 2010). One obvious solution to this problem is to recruit and graduate more students in the disciplines. But this solution is problematic because graduate programs are currently operating at the top of their

capacities (81.5% and 94.8% for the clinical doctorate in audiology and master's degree in speech-language pathology, respectively; ASHA, 2010b). One explanation for why graduate programs cannot increase their capacity is that they are unable to provide enough clinical experiences and supervisors for more students. This creates a bottleneck at the graduate level because there are qualified undergraduates who are unable to continue into graduate programs, which, in turn, increases undergraduate students' stress.

The signature pedagogy's concentration on training students individually in stand-alone clinics could be a part of this problem. By restricting as much of the initial clinical training to university clinics as we do, the pool of clients who students can work with is limited to the clinic's caseload. By training students individually, students often miss out on alternative methods of problem solving and potential solutions from their peers. This signature pedagogy has also led to a mind-set that clinical training and supervision is primarily the responsibility of universities, as opposed to a shared responsibility of all professionals (as seen in other disciplines, like physical and occupational therapy). As a result, university departments may be left struggling to find off-campus supervisors who are willing to take in students, especially students who have not had prior coursework in specific areas.

Taken together, this analysis suggests that connections between our common teaching practices and both educational and workforce challenges can be identified. Although further research will be necessary to specify these connections more precisely, we can begin to consider if and how changes to our pedagogical practices could help reduce these challenges.

Enhancing the Signature Pedagogy of CSD

Following the concepts of signature pedagogies and reflective practice, one can consider other educational and clinical models that may help to address the above challenges. CSD is fortunate because it has a number of aspects of clinical practice that (a) may assist with the issues raised about our signature pedagogy, (b) are parallel with recent principles in educational practice,

and (c) connect to all three levels of a signature pedagogy and features of reflective practice. These include client-centered therapy, evidence-based practice, clinical thinking, and collaboration with clients and colleagues. Table 2 presents each of these features of practice, along with their associated principle in educational practice and the level(s) of a signature pedagogy that are addressed.

Client-centered therapy. Speech-language pathology and audiology have long held client-centered therapy as the expectation for the treatment of communication disorders of many types. Much of the basis for this approach can be traced back to psychological counseling and the influence of Carl Rogers, who promoted the idea of person-centered therapy in the early 1950s (Riley, 2002). One of the guiding principles of client-centered therapy is that clients are "active participants" in determining the direction of their care (Robey et al., 2004, p. 3). This means that consideration is given to the client's desired outcomes and personal preferences as well as to the clinician's expertise and recommendations. Often, the best client-centered therapy represents shared decision making throughout the course of treatment.

The academic corollary to client-centered therapy is learner-centered education. First introduced by Barr and Tagg (1995), this view places the student, or learner, rather than the instructor, front and center in the classroom process. The traditional instructor-centered perspective, the instruction paradigm, assumes that the teacher is the most important person in the room, holding all of the knowledge and needing to transmit it to the students. This is how students have been taught traditionally, and there was little change in this format in any discipline until approximately 1990. At that time, Ernest Boyer called for a re-consideration of scholarship and the beginning of scholarship directed to teaching and learning (Boyer, 1990). A philosophical shift came with the introduction of learner-centered teaching. This view advocates that the ability to empower or facilitate learning is a complex and challenging process rather than assuming that anyone with content knowledge and an engaging lecture style can teach. The new paradigm introduced the idea that faculty should focus on what

Table 2. Associations between the principles of clinical practice and of academic practice and the signature pedagogy level.

<i>Principle of clinical practice</i>	<i>Principle of academic practice</i>	<i>Signature pedagogy level</i>
Client-centered therapy	Learner-centered education	Surface and implicit structures
Evidence-based practice	Evidence-based education	Deep structure
Clinical thinking	Critical thinking	Deep structure
Collaboration with clients and colleagues	Collaborative learning experiences	Implicit structure

the students would achieve in the learning process rather than only on what the instructors would do in the classroom. Further, in the learning paradigm, the students' feedback, performance, and reactions all influence the future shape and structure of teaching (e.g., Weimer, 2002).

Much as we would not conduct therapy without attending to the responses of our clients, we should not conduct education with only limited attention to the responses of our students. There is a growing literature, collectively referred to as the scholarship of teaching and learning (SOTL), whose results suggest that learner-centered teaching leads to deeper and more lasting student learning than the traditional instruction paradigm (e.g., National Research Council, 2000; Weimer, 2006). As faculty members engage in SOTL, they purposefully undertake to examine the relationship between their actions and the learner's experiences. This would move the surface structure of our signature pedagogy toward a more learner-centered focus and model the client-centered therapy approach for our students.

Anyone who has taught undergraduate students in CSD knows how much they want learning that is relevant to clinical practice: They hunger for the touch and feel of the clinic, they wish to build up their own experience and confidence with the clinical process, and they want to know how much clinical work satisfies them personally as a career choice. If we are to be learner centered, we should develop ways that give students early experience with the clinical process. There should be initial educational experiences that give a taste of the mechanics of the clinical process. The mechanics of clinical practice, such as how to interact with a client, or how to behave in a professional manner, are part of the surface structure of our professions. They also demonstrate the implicit structure of the profession by exposing students to what clinicians value as they work with clients.

Evidence-based practice. Speech-language pathology and audiology are based on the underlying principle of evidence-based clinical practice (e.g., Apel & Self, 2003; Dollaghan, 2007). That is, they rely on the relevant research literature as the evidence to guide the evaluation and treatment of clients (Sackett, 2000). Qualified clinicians seek out evidence in the scholarly literature that demonstrates to them that the methods chosen are supported by the existing body of research. They then apply the literature to their past clinical experiences and the values and wishes of the client with the goal of maximizing the effectiveness and efficiency of their services. Unfortunately, the reliance on evidence-based practice has not historically been carried over into the classrooms in which future clinicians are being prepared (Ginsberg, 2010).

Rather, much of the education taking place in higher education classrooms, including CSD, is based on what Shulman referred to as an "impoverished model of apprenticeship" (Shulman, 2004, p. 230). Faculty members tend to teach not in a way that they know to be effective based on research, but rather in the way they were taught as students.

Instead of designing our curriculum in a way that mirrors the curriculum we had when we were students, we need to turn to the evidence base that exists to inform us of best practices in teaching. This means looking to the SOTL literature, from our own fields and beyond, to understand what pedagogical methods can be used to increase our teaching effectiveness and improve our students' learning outcomes. Recent advances in teaching suggest that involving students in real-life challenges that are slightly outside of their current knowledge and skills leads to deeper understanding and longer retention of the material. Academic service learning and problem-based learning are examples of approaches that involve this method (e.g., Bain, 2004; Fink, 2003; Kent-Walsh, 2011; Rhem, 1995; Savery, 2006; Weimer, 2002).

These findings have led faculty members in many CSD programs to alter their teaching methods. Ultimately, if these changes were to become more widespread, they would enhance our signature pedagogy as well as individual courses or programs. This is currently taking place within the SOTL literature, where increased attention is being paid to the impact of these studies on the curricular level (e.g., Tagg, 2003). At present, however, these changes are not prevalent enough to alter CSD's signature pedagogy. University faculty members preparing students should turn to the evidence base of literature regarding effective teaching in much the same way that they are expected to rely on evidence-based practice as clinicians. We need to model the reliance on the literature for evidence-based education for our students and reinforce for them the value of professionals relying on evidence in clinical practices.

Clinical thinking. The ASHA Standards for Accreditation (2011) indicate that a person applying for certification through ASHA should be able to use his or her clinical problem-solving skills to evaluate and treat clients using appropriate adaptations and modifications. It is clear that academic programs are supposed to have a deep structure that prepares future clinicians to use critical thinking skills to assess and treat clients appropriately. It is not clear, however, that we are providing students with the opportunity to develop these skills in the classroom. Rather, it appears that there is a disconnect between the type of learning we expect to take place in the classroom and the critical thinking skills we expect of students

in clinical settings. It is unclear why, for so many classroom instructors, the teaching of clinical thinking skills is primarily the domain of clinical supervisors. As described earlier, this adds to the stress felt by students in their first clinical practicum experiences. If we are to improve clinical problem solving for our students, we must give them every opportunity to practice this skill in situations that relate to clinical questions but that precede independent practicum.

There are instructional practices that could be employed to introduce clinical thinking prior to independent clinical practice. For example, case studies have long been recognized as an effective tool for improving critical thinking in many fields, including CSD (Chabon & Cohn, 2011). As Wiig noted (Tanner, 2006, p. vi), "Good stories let us integrate and create coherent and harmonious mental models so that we can understand relationships and make sense of the whole." Case studies can be used to connect research to clinical practice and to help students understand the client within a context, rather than in isolation as communication disorders are often depicted in textbooks.

Problem-based learning is another method of integrating clinical thinking into the classroom in a way that helps prepare students to be practical problem solvers (Hung, Bailey, & Jonassen, 2003, p. 16). Problem-based learning is employed when students are given a problem to solve and they must both find additional information as well as think through the issues to arrive at a defensible solution. Learning outcomes are improved through the use of problem-based learning in that students retain more knowledge, find the learning experience more satisfactory, and perform better than students learning in traditional modes (Visconti, 2010). Visconti (2010) also noted that problem-based learning brings the opportunity to analyze a problem critically. Students can develop a unique and appropriate solution as they strive to find a possible resolution to a clinical problem for which there is no single right solution. The integration of increased opportunities for the development of clinically based critical thinking skills throughout the curriculum would decrease our students' frustrations. It may also shift the deep structure of our signature pedagogy from its emphasis on learning theory prior to practice toward one that is more reflective of professional practice (in which theory is used to guide and support clinical decision making).

Collaboration with clients and colleagues. SLPs and audiologists collaborate during the provision of client-centered treatments not just with clients, but also with other professionals, including physicians, physical therapists, occupational therapists, nurses, educators, and other SLPs and audiologists. It is in

the best interest of our clients of all ages and in all settings that collaboration be effective enough to promote optimal outcomes for those we treat (Peranich, Reynolds, O'Brien, Bosch, & Cranfill, 2010). It is an accepted standard of our discipline that we function as effective collaborators in our work environments; thus, we should foster the development of collaborative skills during graduate school. Unfortunately, the reliance of graduate programs to center their practicum offerings in stand-alone university clinics makes this more difficult. Students may not receive experience with collaboration until late in their graduate program, yet this is an essential implicit value of a practicing professional in CSD.

Students may voice a preference for working individually on classroom projects. They may express concerns that they are busy, it is hard to coordinate efforts on group projects, and that others might not carry their weight in the group. These are not only the realities that students face in completing group work; they are also the realities that colleagues face in working collaboratively in almost all professional settings. If we want students to learn how to work effectively with others, they should be educated in this process. In order to be collaborative colleagues, we must teach our students to be collaborative learners. Problem-based learning is one way to increase student collaborations (Visconti, 2010). This method of teaching not only asks students to use newly acquired knowledge in real-life applications; it typically asks them to come together and work in a group.

Collaborative skills can be developed in the classroom through a variety of collaborative learning techniques. The choice of collaborative learning activities must be made by the instructor in concert with the learning objectives for the topic or course and should be structured in a way that supports learning of the content as well as the opportunity to identify the value of working with others. Cooperative learning activities can be completed by teams of two or more students. They can include simulation exercises, role-playing clinical scenarios, problem solving, peer teaching, discussion groups, and writing groups (Barkley, Cross, & Major, 2005).

The evidence for the effectiveness of using cooperative learning activities in the classroom is strong (e.g., Barkley et al. 2005; Umbach & Wawrzynski, 2005). In addition to the value of practicing collaboration, the use of these teaching methods is associated with increased student engagement, knowledge, and practical competencies with the material (Barkley et al., 2005; Umbach & Wawrzynski, 2005; Potts & Ginsberg, 2008). These opportunities allow students to learn how to be collaborative professionals while being collaborative learners. They also allow our

signature pedagogy to mirror our professions more accurately at the implicit structure level. As students move from stand-alone clinics within universities to real-world settings, they quickly learn the value of collaboration in the schools and health care facilities. Additionally, clinical supervisors in these settings make significant contributions to the educational process by helping students develop their collaborative skills. This is critical, as the implicit level of our signature pedagogy needs to reflect the values of practicing professionals.

Toward a Revised Signature Pedagogy of CSD

The signature pedagogy of CSD has taken many years to develop to a mature state, and it is ubiquitous in its influence on our clinical education programs. It is the backbone of our professions, but it is not perfect. As Schulman (2005) reported, signature pedagogies are fluid. They change in response to needs from demands on student learning and the interests of many stakeholders in the clinical practice. In the interest of promoting a discussion toward revising the signature pedagogy of CSD, we offer the following five suggestions. Although extensive details for achieving each suggestion are not listed, they will require careful consideration of philosophical, financial, and administrative implications, as well as customization to the characteristics and circumstances of individual programs. For example, any change to the signature pedagogy of CSD must meet the standards of the professions as defined by ASHA's Council on Academic Accreditation in Audiology and Speech-Language Pathology. It should be noted, however, that one of the purposes of accreditation is "to encourage, where appropriate, scrutiny and planning for change and needed improvement" (Council on Higher Education Accreditation, 2010, p. 6). We recognize that there will likely be a variety of opinions about these suggestions and hope that any disagreements can be used to spur productive dialogue.

Solutions to large educational concerns within the discipline need to consider the impact that the signature pedagogy has on those problems, and vice versa. There are a number of important academic challenges faced by our discipline. If we are to fully address these challenges, we should consider how our signature pedagogy contributes to the concerns and how enhancing the signature pedagogy may alleviate the issues. Administrators and faculty members in CSD should consider the impact of the signature pedagogy on educational concerns. Potential solutions should be discussed in light of how they relate to the surface, deep, and implicit structures and to our emphasis on

theory-first practice. Grounding our solutions in these frameworks or our clinical models will help ensure that our signature pedagogy accurately reflects our field while preparing students for professional practice.

It is not the case that solutions that do or do not follow the current signature pedagogy necessarily reflect better practice. Yet, this relationship may have an impact on how much change is necessary and how accepting individuals will be in making these changes. Ideas that contradict the current signature pedagogy can be presumed to be more likely to meet initial resistance. Therefore, we need to conduct research-based, deep analyses as we contemplate changes to our common teaching practices.

The signature pedagogy should be made more explicit to students in how it relates to clinical thinking and problem solving. Overt discussions between faculty and students about our signature pedagogy should take place throughout the curriculum. Undergraduate students entering the field need to learn not only what SLPs or audiologists do, but also how they think and why they make the choices they do. It is important to maximize the opportunities for knowledge and skill development that are available in both the classroom and clinical experiences at all levels of training (as outlined in the ASHA Standards for the Certificate of Clinical Competence [2009]) and transfer their learning from one context to another. Students should learn how their training compares to related disciplines and how this leads to different viewpoints. Such analysis would help students collaborate more effectively with colleagues from other disciplines in later experiences. Such cross-discipline awareness may also be of assistance to faculty when working with administrators who are from other fields.

A better understanding of the signature pedagogy of CSD may decrease students' desire for the one "correct" solution to complex clinical problems. As Shulman wrote, "Signature pedagogies are pedagogies of uncertainty.... Interestingly, learning to deal with uncertainty in the classroom models one of the most crucial aspects of professionalism, namely, the ability to make judgments under uncertainty." (2005, p. 57). Likewise, Schön (1983, 1990) argued that experiencing these types of uncertainty throughout their educational experiences results in professionals who are better at decision making and learning from and within their own experiences. As students increase their understanding of the signature pedagogy of the field, they can use the pedagogy to help make decisions. By engaging in student-centered learning activities, such as problem-based and service learning, students get firsthand experience with what it is like to be a member of the professions, including the role that uncertainty plays in daily clinical practice.

More evidence-based and learner-centered education should be considered within the signature pedagogy. For most faculty members, evidence-based clinical practice is central to what they teach. It is so infused into the curriculum of CSD programs that it may now be a part of our signature pedagogy. Yet, in contrast to their use of evidence for clinical practice, few faculty members in the field consider the teaching and learning literature when developing their educational practices. In relation to learner-centered teaching, if we maintain our reliance on the traditional instructor-dominant paradigm, then we are likely to continue to see disconnects in student learning between classes and from the classroom to the clinic. Both learner-centered and evidence-based models demonstrate to students the relevance of integrated knowledge. The task of solving complex clinical problems requires students to explore numerous options and make connections across multiple areas of knowledge and practice, which should result in increased retention and abilities. Table 3 demonstrates how proposed educational changes like these can alter the signature pedagogy and practice type of the discipline. Changes like these are not necessarily easy. They require a careful review of the SOTL literature, may conflict with traditional teaching methods, and can be unlike students' prior educational experiences (e.g., Doyle, 2008).

Undergraduate students should be included in the clinical process from the start of their program. Not all disciplines wait until students have completed many years of classroom education before they are included in professional activities. Fields such as architecture, the performing arts, and teaching typically include

students in real-life, professional settings early on in their training. These students are highly supported and are not expected to perform at a professional level, but they are directly engaged in the occupation. In the past, CSD included more professional experience prior to graduate education than it currently does. Prior to graduate degrees being required as terminal for professional practice, undergraduates routinely saw clients both on and off campus. Now, many students entering master's programs have had no direct clinical contact hours.

As noted above, decoupling clinical learning from practicum that occurs only in graduate programming would be expected to increase the extent to which students understand and internalize the student learning outcomes in our clinical curriculum. In the early years, for example, undergraduate clinical experiences could emphasize observation and assistant-like duties. Later, undergraduate students could work with graduate clinicians in more active, but still supportive, roles (e.g., as conversational partners). Doing so should (a) help acclimate students to the procedural activities of clinical practice at an early stage; (b) enhance students' early exposure to critical thinking, clinical decision making, and values of the professions, thereby helping them apply and integrate theoretical information and reduce the stress and uncertainty of waiting so long to develop their clinical skills; and (c) reduce our reliance on our university stand-alone clinics for the bulk of clinical learning.

Clinical experiences should rely less on stand-alone university clinics. As outlined above, graduate programs are limited in the number of clinical experiences they can provide to students, which results in

Table 3. Associations between aspects of signature pedagogy and reflective practice with proposed revisions to communication sciences and disorders' common educational practices.

<i>Educational model</i>	<i>Proposed revisions to common educational practices</i>
Signature pedagogy	
Surface structure	Learner-centered methods emphasizing what and how students are learning. Early exposure to and experiences with clients. Evidence-based selection of teaching methods.
Deep structure	Prepare students to use critical thinking skills for assessment and treatment. Minimal need for supervision with master's degree.
Implicit structure	Importance of communication to all people. Meeting the individual needs of each client. The desire to maximize client outcomes. Collaboration with clients and colleagues.
Practice type	
Theory-first	None.
Reflective practice	Instructional practices such as learner-centered teaching, problem-based learning, and service learning. Use of professional experiences to promote content/theoretical learning. Early exposure to and experiences with clients.

fewer students being accepted into programs than are needed to meet professional demands. Relying on stand-alone clinics contributes to this issue because university clinics tend to bring in far fewer clients than off-campus clinics. Also, stand-alone clinics tend to expose students only to SLPs and/or audiologists. As a result, students have little interaction with the other professionals whom practicing clinicians work with on a regular basis (e.g., occupational therapists, physical therapists, physicians, social workers, and teachers).

Stand-alone university clinics need to be integrated into other options for clinical learning, but they do not need to be eliminated. Instead, these clinics should be enhanced with other forms of clinical teaching. For example, CSD programs could collaborate with local agencies so that students could participate in their clinics across multiple semesters. The student may start by observing and then assisting with tasks and progressively move toward direct assessment and intervention experiences. Or, class members could make multiple visits to an agency, where the instructor and agency clinician could work together to scaffold learning experiences. In either case, students would be exposed to clinical experiences early in their programs and be able to develop their skills over time. The agencies would benefit by having the same student(s) across multiple visits so that they would not have to retrain new students constantly.

Conclusion

In the time since Shulman (2005) and Schön (1983, 1990) first introduced the concepts of signature pedagogy and reflective practice, a number of disciplines have examined their common teaching practices and how they might be improved (e.g., Chick et al., 2012; Gurung et al., 2009). The views expressed here are a first attempt at discussing this within the discipline of CSD. Based on our own experiences and reflection, we have made the case that educational and workforce challenges to the discipline are connected, in at least some ways, to our common teaching practices. We hope that this discussion will spur more specific research into our teaching practices and their connections to challenges like those discussed here.

The signature pedagogy of CSD is successful, as thousands of new clinicians graduate every year and enter the workforce. Nonetheless, we believe that the discipline should consider changing aspects of our signature pedagogy so that it can help resolve, rather than contribute to, educational concerns that we are facing. We suggest that faculty members and university programs work to enhance student learning by

making educational experiences that match those of Schön's (1983, 1990) concept of a reflective pedagogy; through learner-centered education, evidence-based education, critical thinking, and collaborative learning experiences. We recognize and support our colleagues who are currently teaching in these ways and encourage others to follow in this direction.

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