CICSD

The Apprentice: A Model for Mentoring Students in Research in Communication Sciences and Disorders

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ABSTRACT: **Purpose:** The purpose of this article is to present and illustrate an apprenticeship model of student research mentoring. The aim of this model is to provide mentoring and hands-on research experience for students.
Method: Specific examples of the application of this model to the field of communication sciences and disorders, as well as advantages over other models of research, are presented. Practical advice for the successful implementation of the apprenticeship model is offered for faculty members and students.
Conclusion: Benefits of the apprenticeship model include faculty–student collaborations, a sense of accomplishment for the student, and fostering a passion for scholarship. It is hoped that use of this model will serve to stimulate students' interest in pursuing a career in academia, which is sorely needed in our field.

KEY WORDS: communication sciences and disorders, students, research, mentoring

It is widely known (and lamented) that there is a shortage of available doctoral-level applicants for academic positions in communication sciences and disorders (CSD; Busacco, 2002; Creaghead, 2002; Ingham, 2003; Madison, Guy, & Koch, 2004). This serious problem has the potential to adversely impact academic training programs; some in our field might argue that this has already begun to happen. Ultimately, this shortage of available doctoral-level applicants could slow the growth of our knowledge base and lessen our ability to educate future professionals, which would negatively impact our clients (Mueller & Lisko, 2003).

As the name of our field implies, CSD is both an academic discipline and a clinical profession. As an academic discipline, we seek to understand normal and disordered communication. As a clinical profession, we are involved in the assessment, diagnosis, and treatment of communicative (and swallowing) disorders. Ideally, practitioners in our field should be concerned with both of these aspects.

Historically, CSD has contributed new information to the field from independent research as well as through collaboration with other disciplines such as academic disciplines (e.g., linguistics, experimental psychology), clinical professions (e.g., medicine, clinical psychology), and the basic sciences (e.g., physics, biology). In order for the field to advance, it is imperative that such research (both independent and collaborative efforts) continues to thrive. However, if the trend of declining doctoral students and interest in research continues, the outlook is less than positive. Therefore, it is important for the field of CSD to foster an interest in research as well as to

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infuse opportunities to learn and conduct research into our training programs. Such opportunities are necessary so the field does not suffer from a lack of new information that is generated with rigorous scientific integrity.

Potential solutions for declining research (and researchers) in CSD include involving and encouraging our students in research as early as possible. Among numerous reasons given for not pursuing a doctorate, a lack of research interest is one of the most commonly cited (Madison et al., 2004). Students often cite limited opportunities for research training in their curricula as well as limited hands-on research experience. Unlike undergraduate curricula in other behavioral sciences such as psychology, undergraduate curricula in CSD generally require little, if any, coursework in research methodology. In addition, some students tell us that they are interested in conducting a research project but feel "lost" with respect to how to get started or even how to choose a topic or formulate a research question. Many of the problems perceived by these students may be attributed to their academic departments adopting either a strictly faculty-directed approach to research or a purely student-directed approach.

In the traditional *faculty-directed* approach to research, faculty members are actively engaged in research in their specific areas of interest. Undergraduate students may be allowed or even solicited to assist in a study, but strictly in a supporting role (e.g., data collection, soliciting participants, etc.). In a survey of research practices in CSD, Mueller and Lisko (2003) found that many respondents reported using student assistants in this capacity. Such duties might earn the student an acknowledgment on a publication or poster but are usually insufficient to qualify for co-authorship. These projects are clearly the purview of the faculty researcher, who takes primary responsibility (and primary credit) for formulating the hypothesis, designing the study, and so forth. Although this opportunity might offer the student some research training, independent study credit, and/or financial compensation, it represents a limited and potentially uninspiring research experience. Unfortunately, because of tenure and promotion requirements at the more research-oriented universities, many faculty members are simply unable or unwilling to devote time to truly collaborative and mutually beneficial research opportunities for students.

In the *student-directed* approach to research, it is the student who has a research idea, which may or may not be well formulated. The student then finds a faculty member who is willing to supervise him or her on the project, but it is the student who takes the primary responsibility for the design and execution of the study. Some students find this appealing (as least initially) because it allows them to do something that they are interested in with maximum freedom and creativity. Unfortunately, many students simply do not have the research skills or experience needed to successfully complete such an independent project (without delaying their graduation or pulling their hair out). This is especially problematic in the case of a graduate student who is attempting to complete a thesis "from scratch" while maintaining a hectic course load and clinic schedule. Considering that some master's programs in CSD are completed in as little as three or four semesters plus an externship, completing a thesis in time to graduate can be a daunting task.

From the faculty member's point of view, these student projects are often perceived as having potential disadvantages. Some students, for example, have interesting and heartfelt research ideas that are not necessarily feasible given the available resources. One former student asked me to supervise her on a study involving 100 persons who stutter (PWS) and 100 matched control participants. My response was to tell her that if she could find 100 PWS who were willing to participate in research, not only would I help her do the study, but I would also name my first-born child after her! Unfortunately, many students are not fully cognizant of the time and resources required to conduct an empirical research project involving human participants (especially in a clinical population).

Another perceived disadvantage from the faculty member's perspective is that student projects are not necessarily of much aid in meeting the requirements for tenure and promotion. In fact, some tenure committees do not give much weight to the supervision of student research projects, even master's theses, unless they culminate in peer-reviewed publications. Also, faculty members may not be genuinely interested in participating in studies that are outside of their areas of specialization. Many of us can relate to the experience of being asked (or even begged) to supervise a project that we really did not feel qualified or competent to direct, often for the convenience of the student (or another faculty member).

An alternative method of encouraging and fostering an interest in research among CSD students is to use an *apprenticeship* model, similar to those employed in psychology and the natural sciences (Blanchet, 2010). In this model, the faculty researcher is actively engaged in a line of inquiry (or perhaps two) related to his or her area of specialization. Any ongoing research projects, planned future projects, or spin-off ideas may serve as opportunities for students to

participate in real research at whatever level they are able to at that point. Ideally, the student will continue his or her participation in research with that faculty member with gradually increasing independence. For example, an undergraduate student who joins a research team led by a faculty researcher may choose to eventually lead a subsequent project as a graduate student at the same university.

I was initially exposed to this type of research model as a first-year doctoral student in psychology. Although I only remained in that program for 1 year before pursuing a PhD in CSD, I found the research experience that I gained to be invaluable. My mentor was an assistant professor on the tenure track at the time who had a well-established program of research involving children with developmental disabilities. His work involved data collection at multiple school settings off campus. By the time I joined his research team, there were several studies underway. Doctoral students at various points in their training, as well as several undergraduate students, participated in one or more studies each semester. The newer students primarily assisted with data collection; the more advanced students used their prior experience to develop spin-off projects in which they took a more active role. Some of these studies eventually culminated in theses or dissertations. All of the students involved (myself included) seemed to feel that they were contributing to meaningful research projects and were being provided with appropriate mentoring, support, and resources.

This type of mentoring approach has several advantages for both the student and faculty member. For the student, it provides an opportunity to gain supervised research experience without being required to develop a research question from scratch, and without having to take sole responsibility of every aspect of the study (as often happens with more student-directed projects). Students are able to "get their feet wet" with guidance, mentoring, and support, with the goal of gradually increasing their skill and comfort levels.

Additionally, faculty researchers usually have more of a vested interest in studies that are related to their areas of specialization. This makes it more likely that the faculty member will collaborate with the student on a manuscript that is suitable for submission to a peer-reviewed journal. Publication is especially important for those faculty who are working toward tenure and promotion, who might feel that they can more easily justify devoting time to a publishable project. The faculty member might also be more likely to devote time to a project that fits into his or her program of research, which is considered highly desirable at many institutions. It is also beneficial for the student to get his or her name on a publication, especially if he or she decides to pursue doctoral studies in the future.

Apprenticeship Example

What follows is an example of a line of inquiry examining university students' perceptions of PWS. This line of research was initiated by the present author and eventually blossomed into a collaborative, multistudy endeavor involving this researcher, CSD students, and faculty from other departments (e.g., Lake, Blanchet, Levonyan Radloff, & Klonsky, 2009). Although my early research involved the effects of delayed auditory feedback on the dysarthric speech of clients with Parkinson's disease, I later became interested in how university students perceived PWS. This interest came about primarily because I am a person who stutters who also teaches at the university level.

Prior research examining individuals' attitudes toward PWS suggested a pervasive negative stereotype (e.g., Dorsey & Guenther, 2000; Kalinowski, Stuart, & Armson, 1996; Woods & Williams, 1976), although some studies also identified a small number of desirable personality traits (e.g., Burley & Rinaldi, 1986; Turnbaugh, Guitar, & Hoffman, 1979; Yairi & Williams, 1970). Some previous studies examined students' perceptions of stuttering; however, most such studies presented respondents with a hypothetical construct of a person who stutters. In other words, participants were given a written story about a person who stutters who did not actually exist, and participants had no opportunity to see or hear this person stutter. I soon discovered that there was a paucity of research examining the perceived effectiveness of an actual instructor who stutters in the context of a university course. Again, being that I was a professor who stutters and I had access to students in my classes, I welcomed the opportunity to obtain more ecologically valid data regarding students' perceptions of PWS.

Toward that end, I began a series of studies using survey methodology to measure students' perceptions of an instructor who stutters (i.e., me). During my first semester in my new tenure-track position, a graduate student expressed an interest in completing a research project, specifically in neurogenic communication disorders (my primary area of research at that time). I explained to her that, as a new faculty member, it would take some time to solicit research participation from a clinical population. A survey study with student participants would be more expedient, and given that I was planning on initiating this second line of research anyway, we agreed to use this opportunity to create a win–win situation.

In the fall of 2005, we began what I refer to as the hunting-and-gathering phase. I enlisted help from colleagues in psychology and sociology, both of whom were more experienced in survey methodology than I was. I also used this time to set up my research lab and to obtain some equipment that we would need, such as an extra computer for data entry and analysis. In the spring of 2006, this newly formed research team began the planning-and-preparation phase of the study, which consisted of conducting weekly research meetings, reviewing the relevant literature, discussing and refining ideas for the design of the study, and so on. Throughout this process, all four collaborators participated as equal team members, with each person's ideas being valued and welcomed.

By the summer of 2006, we were ready to conduct a pilot study. We used the results of this study to refine our methodology and work out some of the bugs. In the fall of 2006, we conducted the second study in this line of inquiry, with my graduate student taking the lead role; this study culminated in her directed study. In the department I was working in at the time, a directed study was essentially a thesis without a formal committee (and without the prospectus and defense meetings). This option, like the thesis option, could be chosen in lieu of two elective courses and the comprehensive examination. This mechanism was created to allow graduate students to complete a research project that is suitable for publication without the constraints of a thesis. As those of us who publish in peer-reviewed journals are aware, academic formats for theses and dissertations are often quite different from those expected for a journal article. Therefore, as many view a peer-reviewed publication as the "real prize" anyway, this directed-study option afforded students an opportunity to conduct a study that was geared specifically toward publication.

By late fall of 2007, several months after my student had graduated with her master of science degree, we submitted the manuscript for publication (Lake et al., 2009). As this outstanding student took primary responsibility for the study, she clearly earned first authorship. Fortunately for me, it did not take long for another student to approach me about participating in research. She was a junior with a strong interest in research and a particular interest in stuttering. This student did not have any specific agenda of her own; she simply wanted to help out and gain research experience before graduate school (she would eventually complete a master's thesis at another university). Therefore, with our fifth team member firmly in tow, we conducted a follow-up study in 2008. Not only did my new collaborator gain research experience and independent study credit for her valuable contributions, but she was also able to conduct a poster session with me at an American Speech-Language-Hearing convention (Blanchet, Levonyan-Radloff, Lake, Klonsky, & Butler, 2010).

Practical Advice for Faculty

I present the following tips for faculty who are considering participating in an apprenticeship model of student research mentoring.

- ***Talk about your research in your classes.*** Many years ago, I learned how beneficial it is to let your students know what you are doing each year. Toward that end, I routinely begin the first day of each class by introducing myself and briefly describing my research. Although most students look at me like I have two heads, there is usually one interested student who will approach me after class to discuss my research. I also make it a practice to overtly solicit student participation, especially if I plan on collecting data that particular semester. I quickly discovered that most undergraduates do not realize that they are able or even allowed to participate in research with their professors. As faculty in CSD, we need to dispel this "research is for someone else" attitude that is so prevalent in our field. We all have a part to play in the implementation of evidence-based practice.
- ***Volunteer to speak to your student association.*** Most, if not all, CSD departments have a student organization, usually with a snappy acronym. At my previous institution, this group was known as the Communication Disorders Student Society. As they were always looking for speakers for their periodic meetings, I was eventually invited to come and address the constituency. What surprised me even more than simply being invited was the specific topic they asked me to address: student research! By approximately halfway through my presentation, it did not seem to be going well; one student walked out, one fell asleep, and many of the others had that glazed over look. However, I then began to mention several reasons for participating in research with faculty, one of which was the possibility of earning a strong letter of recommendation for graduate school. Miraculously, all eyes were suddenly on me. Within 2 days, I had eight students in my office asking to assist me with my research!
- ***Use the independent study.*** Like many professors, I am frequently asked by students to supervise independent studies for them. In my experience, most students who request this do not

have a specific idea in mind. They either wish to do something in CSD rather than take another elective outside of their major, or they desire something more advanced or more applied than simply another lecture course. The independent study provides an opportunity to recruit students to assist with a study that you and/or more advanced students are conducting. It is hoped that the positive experience that the student has will kindle an interest in research that will be further developed in a subsequent semester. For example, I once led an independent study seminar in cluttering with five undergraduates. One of the students conceived of an idea for a study based on one of the readings she did, and she and two other students collaborated with me on said study that next year.

- **Consider alternative research methodologies.** Although the group-difference design is considered by many in our field to be the gold standard, there are some advantages to using other designs, especially for studies involving student collaborators. For example, single-subject designs obviously require fewer participants than group-difference designs and do not necessarily involve the use of inferential statistics. This may be advantageous for students who are attempting to complete a study in time to graduate, especially those with a limited background in research design and statistics. In addition, single-subject designs are seen by many as more clinician friendly and are often appropriate for testing the effects of treatment empirically. Such studies may be appealing to students who aspire toward a clinical career as a speech-language pathologist.
- **Take advantage of grants/awards for undergraduate research.** Like most tenure-track faculty members, I am actively seeking funding, both intramural and extramural, for my research. I have found that some of the more teaching-oriented institutions are more likely to offer intramural research grants for work involving students than for faculty-only research. In addition, organizations such as the American Speech-Language-Hearing Association frequently offer grants and awards for researchers who are mentoring students. Such funds are often used for salaries for student assistants, compensation for participants, equipment, and perhaps travel expenses (for presenting findings). Again, a little extra money may help to increase a student's ability and/or willingness to undertake a research project.

Practical Advice for Students

I present the following tips for students who are considering participating in an apprenticeship model of student research mentoring.

- **Start as early as possible.** If you are interested in participating in research, it is generally better to start sooner rather than later. You certainly do not have to wait until your senior year before participating in research with faculty and/or other students. You probably have much more to contribute to a research project than you realize.
- **Get to know your faculty.** The best way to find out which faculty members are conducting research is to simply ask them. Do not be afraid to approach a professor to discuss your areas of interest or ideas. There is nothing that researchers enjoy more than discussing their research with a genuinely interested party (except, perhaps, getting a grant or getting a paper accepted for publication). Also, when a professor discusses something in class that captures your interest and imagination, consider the possibility of initiating a research project in that area. It is much more enjoyable to devote time to a project when it is something that you are truly passionate about.
- **Be flexible.** Some students are interested in conducting research in a specific area of interest (e.g., autism) but are unable to find faculty specializing in that area who are able or willing to supervise their project. Unfortunately, many CSD departments are shorthanded when it comes to doctoral-level faculty. Therefore, it may be worth considering working with a professor who has a different area of expertise (e.g., fluency disorders), especially if he or she is active in research. Remember, gaining experience and developing your research skills should be the primary objectives. You might end up becoming interested in an area of our field that you never considered before.
- **Be open to the possibilities.** One plausible reason for the current shortage of academic faculty in CSD is that most students enter the major because they are primarily interested in a clinical career. Although that is certainly a noble pursuit, it is worth considering obtaining research experience nonetheless. Some of the many benefits of participating in research include becoming part of a team that is working toward a common goal, meeting other students with similar interests, developing your writing skills (definitely a plus when it comes to writing clinical reports),

and acquiring statistical and/or computer skills. Remember, most graduate programs in CSD require a research methods course.

- **Think about graduate school**. Reading comprehension, writing, and quantitative skills that are developed through research participation will come in handy when it comes time to take the Graduate Record Examination. Of course, there is also the sense of pride and accomplishment that one experiences when presenting his or her work to his or her peers (e.g., at a regional or state conference). In addition, many universities offer academic scholarships, and research experience is a great way to increase the likelihood of being considered favorably for such awards. As we all know, a little extra money certainly helps in graduate school.
- **Consider completing a thesis.** Many students do not consider becoming involved in research during their undergraduate years because they do not plan on choosing the thesis option when they enter graduate school. However, if you do have an interest in research, there are several benefits of completing a thesis. First of all, most programs will waive two elective courses and the comprehensive examination requirement for students who choose this option. Some students find it much more interesting to apply their skills to a project that they are truly passionate about rather than taking more lecture courses that they may not have any interest in. Due to the academic shortage in CSD, especially in many smaller programs, students often have few (if any) electives to choose from. Also, choosing the thesis option means that you will not have to worry about taking the comprehensive exam. While most of your classmates are stressing out over comps, you can be finishing up a project that will bear fruit in the future (e.g., a publication, presentation, award, etc.). Contrary to what some students believe, the PRAXIS exam is significantly different from comprehensive exams in many graduate programs, in terms of both format and scope. Therefore, studying for the PRAXIS alone does not necessarily lead to success on a comprehensive exam.
- **Do not underestimate the benefits of publication.** Whenever I discuss a research project with a student, the topic of publication usually comes up fairly early in the conversation. Usually, the student's reaction is a mixture of surprise, confusion, and apprehension. He or she typically does not even consider the possibility of submitting his or her work for publication and often expresses a somewhat apathetic attitude toward the very prospect. However, exploring this possibility even before beginning the study is advantageous. Besides the fact that publication is certainly a feather in your cap, any professor on the tenure track will naturally have a predilection for projects that are at least publishable. Many students are unaware of tenure and promotion requirements and do not realize just how important it is for faculty to publish in peer-reviewed journals. If you at least express a willingness to eventually submit your work for publication (even if it is after you graduate), your mentor may have more of a vested interest in your project. This is definitely a good thing, as you always want your collaborators to feel as if the endeavor is a win–win situation.

Conclusion

As alluded to throughout this article, it is imperative that academic faculty in CSD take steps to actively involve their students in research as early in their academic careers as possible (i.e., at the undergraduate level). Benefits of this include faculty–student collaborations, a sense of accomplishment for the student, and fostering a passion for scholarship (Mueller & Lisko, 2003). I hope that this will serve to stimulate students' interest in pursuing a career in academia, which is sorely needed in our field. Such mentoring requires strong commitment on the part of training programs, particularly faculty members who are engaged in research. Ultimately, all members of the CSD community have a stake in the doctoral shortage, and we all can (and must) be part of the solution (Scott & Wilcox, 2002). If done with care and foresight, this process can be mutually beneficial and rewarding.

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