Undergraduate Research: How Advisors Can Help Their Pre-Health Students Understand the Role That Scholarship and Creative Activities Play in the Admissions Process

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Introduction

Recently, I've had more conversations with my advisees about research than I have had at any time in my career. In most cases, students have read or been given oversimplified advice regarding the necessity of research in the development of a competitive application. I find that many of my students believe (falsely, in my opinion) that research is the extracurricular activity most preferred by admissions committees. What follows is the approach I use to help my students understand the role that research plays in the application and admissions process and the benefits of participating in scholarly activities. (How to find opportunities and make the most of them is another conversation.) In developing my approach, I drew not only on my experience as a pre-professional advisor but also as a research mentor. In addition, I consulted with a number of health professions school admissions professionals. Although they obviously do not speak for all health professions schools, they do provide insights into how research is viewed by some members of the health professions school admissions community.

Step 1: Understanding and Acknowledging Student Confusion

At the outset, I think it's important to acknowledge that our students' confusion about this issue is understandable. Advisors and (most) students recognize that the college years (and perhaps beyond—during gap/growth years) are the time when students will develop their applications for health professions school (**Figure 1**). Obviously, some components of an application are required, such as strong grades in pre-requisite courses to demonstrate a solid foundation in the sciences. But there are also a whole host of additional experiences, like participation in service-oriented or health-related activities and research, that may enhance a student's application but aren't explicitly required to apply. Additionally, students must demonstrate that they are developing skills and character traits (i.e., competencies) that are well-aligned with a healthcare career.

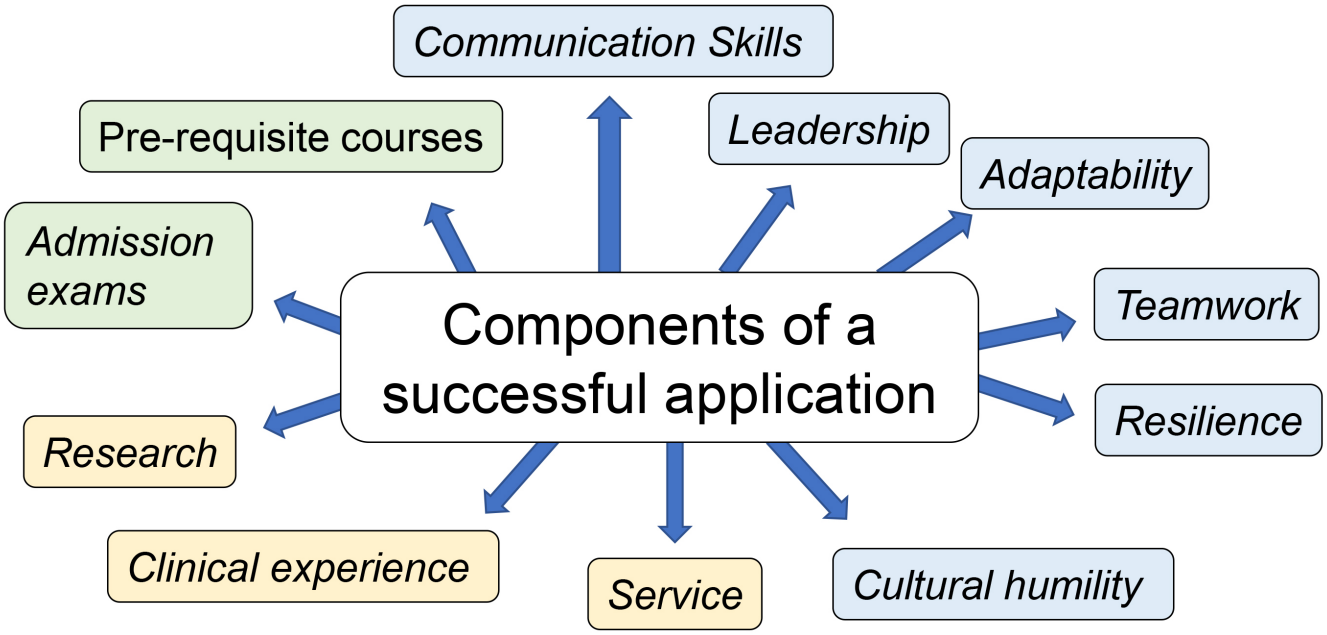

Figure 1. Components of a successful health professions school application. A successful application to professional school includes not only required experiences (green ovals) but also participation in optional extracurricular activities (yellow ovals). In addition, a successful application also provides evidence that the applicant has developed or is developing competencies critical to healthcare providers (blue ovals). Note that this figure includes examples of each element and is certainly not exhaustive.

Pre-health students are also aware that health professions schools are competitive. For example, the acceptance rate for medical school has hovered around 40% for the past several decades (AAMC, 2022a). In my experience, the competitive nature of the health professions school admissions process often drives students to feel like they need to do everything they possibly can to "set themselves apart." Often, rather than focusing on developing competencies, students attempting to "set themselves apart" focus on adding activities/experiences to their resumes.

Admittedly, competencies are abstract concepts, and demonstrating/developing them is hard work that requires applicants to not only reflect on where they may be deficient/need additional maturity but then form a plan to use their current activities/find new activities to help them grow. On the other hand, adding activities/experiences to a resume is much more concrete and is relatively straightforward to do when time and opportunities are not obstacles. For students focused on adding experiences to their resumes, it is only natural that they attempt to discern which activities are most desirable to admissions committees. Again, some of the possible experiences that appear in **Figure 1** are critical (like the MCAT for medical school), but what about the others—are they all important? Are some more important than others? In my experience, students frequently turn to the Internet to answer these questions.

An Internet search of topics like "Undergraduate research and medical school" or "Do I need research to be accepted to dental school?" yields an overwhelming number of search results (over 300,000,000 for both queries at the time of writing). The advice on these pages—many of which are written by undergraduate or health professions students—ranges widely. Some advice is nuanced and seemingly well-aligned with advice

offered by admissions professionals; however, other advice is more absolute—i.e., "You must do research!"—and, therefore, questionable, given the stated requirements of most professional schools and the opinions of some admissions professionals (as described later in this article). This can, understandably, lead to a great deal of confusion and even anxiety among pre-professional students… which leads me to my first piece of advice when it comes to helping students think about research: **Help advisees understand the role research plays in the health professions school admission process.**

Step 2: Helping Advisees Understand the Role Research Plays in the Health Professions School Admission Process

Of course, developing an understanding of the role research actually plays in the admissions process requires that students go beyond a superficial Google search. Reading articles from reputable sources (like *The Advisor* or the Association of American Medical Colleges), seeking out advice from experienced health professions advisors and admissions professionals, and reviewing the requirements of the health professions schools to which the student plans to apply are all appropriate ways to develop an understanding of this topic.

What is clear from a review of the admissions requirements for most professional schools is that, except in some specific cases (e.g., MD/PhD programs or specific health professions schools with a research focus), research is simply not a requirement for admission. In my experience, students generally know this, but they have come to believe that participation in research is an unspoken expectation or a "soft" requirement. Again, I think their confusion is fair, given the advice commonly offered on Internet forums and the statistics shown on reputable websites (e.g., AAMC) that suggest a large proportion of admitted students (~55% in the case of matriculated medical students; AAMC 2022b) have research experience on their resumes.

I asked Dr Jesus Vallejo, Senior Associate Dean of Admissions at Baylor College of Medicine, if his admissions committee valued research more than other extracurricular activities, and he responded, *"No. The vast majority of medical graduates will not go on to become medical researchers, even if they have a strong record during the undergraduate years. Some of the other non-research activities that applicants are involved with can be just as impressive as their research credentials."*

Admissions professionals at four other medical and dental schools I interviewed offered a similar response. Based on my own—admittedly anecdotal—experience, I would argue that research is not only not required, but it's typically not expected either. For every one of my students admitted to health professions school with research experience, I can point to one without any such experience (not too surprising, given the statistics cited above from AAMC).

If participation in research is not required (or even expected), then what accounts for the confusion? In my opinion, the importance of research experiences for pre-health students is typically oversold, and the value of such experiences is oversimplified. This is in part because research is an "easy" thing for someone to recommend to students looking to enhance their application, and, for some applicants with access to opportunities, getting involved in research is a relatively easy thing to do.

Contrast this with a recommendation for developing an abstract competency like cultural humility. In my experience, it is a challenge to help students understand the concept of cultural humility, let alone help them develop a concrete plan to grow in this area. As a result of these sorts of challenges, students looking for ways to boost their application find it easier to sign up for a defined experience, like research, assuming that the activity in and of itself will add value to their application. But I would argue that this is a shallow view of research (or any extracurricular activity, for that matter) and what it takes to add value to an application. **Advisors can counter this mindset by encouraging students to think about research as an extracurricular activity that can help demonstrate a number of competencies, as opposed to "a box to check" or as an activity that on its own will give them an advantage.**

Step 3: Helping Students Focus on Competency Building

The Association of American Medical Colleges (AMMC) has endorsed 17 premed competencies for entering medical students (AAMC, 2023). The list describes the competencies desired in medical school applicants, but these competencies apply equally well to applicants to any health professions school or program, and any experience, research or otherwise, should be examined through the lens of these (or similar) competencies. In other words, what makes any experience, not just research, valuable is more than the activity itself; it is the competencies the experience helps the student demonstrate or develop.

So which competencies does research help a student develop? Again, I put this to admissions professionals (**Table 1**). What is apparent from their responses is that, just like any other extracurricular activity, the value of research derives from the fact that it gives students an opportunity to develop/demonstrate competencies.

Table 1. Competencies That Can Be Demonstrated or Developed Through Participation in Research

Name	Position	Institution	Competencies
Dr Felix Morales	Associate Dean, Admissions	Texas Tech University Health Sciences Center School of Medicine	• Independent learning • Drive • Determination
Dr Judianne Kellaway	Associate Dean, Admissions and Outreach	Long School of Medicine at the University of Texas Health Science Center at San Antonio	• Teamwork • Collaboration • Critical thinking • Problem-solving • Time management • Discipline • Capacity for improvement • Responsibility • Motivation • Resilience • Integrity • Probably many more!
Dr Barbara Miller	Assistant Dean, Recruitment and Admissions	Texas A&M University School of Dentistry	• Organizational skills • Problem-solving/critical thinking • Analysis • Scientific writing • Laboratory hand skills (e.g., fine motor skills for surgeries) • Teamwork • Communication skills—especially behavioral, psychological, and public-health-related research projects)
Dr Jesus Vallejo	Senior Associate Dean, Admissions	Baylor College of Medicine	• Inquisitiveness • Ability to stick with something that isn't an instant win • Organized thinking • Leadership skills • Communication skills • Collaborative skills

Step 4: Asking Students To Reflect on Their Motivation To Do Research

Once students are convinced that research is not required and instead is an activity that provides opportunities to develop/demonstrate important competencies, then they need to decide if research is an activity they should pursue. **Advisors should encourage students to interrogate their motivations for engaging in research.**

My first questions to research-curious students are: Does research sound exciting? Do the techniques sound like something you would enjoy, or is the topic something you would appreciate learning more about? I think these basic questions are really important for two reasons: First, admissions committees are not assessing the value of the experience based on the fact that students "did it" or even on the time they spent engaged in the activity. The value of the experience lies in the ability of students to explain what they learned and how the experience aligns with their stories. According to Dr Judianne Kellaway, Associate Dean, Admissions & Outreach, Long School of Medicine at UT HSC San Antonio, *"The [admissions committee] assesses the value of research from the perspective of the applicant, not our committee's opinion. A person might spend a long, long time in research, but how do they convey the lessons and meaning to us? That is most important."*

Second, research is hard. To be successful, students must believe in the inherent value of the work and have an intense commitment to seeing it through (Burks and Chumchal 2009).

If students are simply participating in research to "check a box," it is unlikely they will be engaged at the level needed to do good work or that they will be able to "sell" an admissions committee that they derived anything meaningful from the experience. In fact, I try to explain to my students that it is really easy for people in the field (i.e., research practitioners) to spot students who have a superficial understanding of their work. In terms of the impact of a research experience on their candidacy, a lack of commitment renders their participation neutral and, in some cases, can actually hurt by giving the impression that students are immature, insincere, or unengaged with the activities they have listed on their applications. At this point in the conversation, some students express relief that they can build a strong application without "research," while others remain interested.

Step 5: Encouraging Students To Think About Research Broadly

Regardless of their reaction to my questions about their interest in research, I encourage all students **to think about "research" broadly, as any scholarship or creative activity focused on any discipline**. Thinking broadly about possible research projects should make it easier for students to imagine incorporating research into their applications in a way that is true to their professional interests and goals and/or to their personal stories.

I often start this conversation by asking my students explicitly: How does research align with your professional story, goals, or interests? Answering this question requires that students first reflect on their professional stories, goals, and/or interests. While talking through why they want to pursue their proposed research area or what type of research they might pursue, I encourage students to "forget" about what they assume will be most impressive to an admissions committee. This is important because some students are overly focused on clinical research or even basic science research with a perceived link to clinical research. While these areas of research are important and often well-aligned with many students' professional goals, they are not available to all students and may not be the best fit for all students, given their actual interests.

Again, if viewed from the lens of competencies, many different types of scholarly pursuits can be valuable and offer opportunities for students to develop critical thinking, leadership, and teamwork skills, in addition to providing them with experience working with primary literature and statistics as well as building their oral and written communication skills. All of these skills have a steep learning curve, but they are transferable to just about any area of science, making them much more valuable than the specific content knowledge a student may gain from the experience.

To help students think more broadly about possible research areas, I often share anecdotes about former students. A few examples of research projects/scholarly activities pursued by my former students and their corresponding profiles appear in **Table 2**. Notice that these students all pursued different research projects, but each project was well-aligned to their interests and goals.

Table 2. Profiles of Former Students and Their Research Projects/Scholarly Activities

Student Profile	Research Project/Scholarly Activity
Holder of a prestigious scholarship for BIPOC students. Developed a mentoring program for young women of color at a local high school.	Developed a mentoring program with high school students interested in STEM that assessed their sense of belonging in STEM and understanding of the college and financial aid application process. Data were used in a senior thesis and to justify additional study of the benefits of the mentoring program.
Indian Health Service (IHS) Scholarship recipient. Interned at an Indian Health Service Clinic. Minored in history.	Informally surveyed healthcare practitioners at several IHS clinics to better understand the challenges and opportunities faced by both practitioners and patients in these clinics. Used the information to develop a personal understanding of IHS clinics and their patients' needs, allowing the student to write a meaningful and authoritative personal statement.
Environmental science major. Interested in the intersection of environmental and human health.	Assessed mercury concentrations in biota from two rivers to develop inexpensive approaches to identifying contaminated ecosystems. Data were used in a senior thesis and a peer-reviewed publication.
Art major. Emergency department intern (where exposure to trauma and death is common). Apple store employee (i.e., customer service and relationship-oriented).	Developed a portfolio of paintings and a senior thesis exploring how contemplating mortality can strengthen relationships and lead to a more fulfilling life.

Dr Valerie Parkas, Senior Associate Dean of Admissions and Recruitment, Icahn School of Medicine at Mount Sinai put it well when she said, *"Students should pursue scholarly endeavors in the area 'that is their thing.' Reflect on your interests within medicine. Are you most interested in the development of new treatments, healthcare policy, healthcare delivery? Engage in scholarship in an area aligned with your goals. Don't be afraid to be creative, you should be able to show capacity for scholarship and creativity, no matter your area of interest. For example, if you volunteer at a free clinic, could you develop a survey to help understand how it's going for the patients? If you find that you can't think of an area of passion within healthcare or an issue that drives you—then you have a bigger problem and may need to spend some more time reflecting on your interest in the field."*

Conclusion

In summary, pursuing research and other scholarly activities can be an exceptionally meaningful activity—but we should **help our advisees understand the role research plays in the health professions school admission process**. Specifically, we should remind them that research is not required. Instead, we should **encourage our students to think about research as an extracurricular activity that can help them develop pre-professional competencies, as opposed to "a box to check" (i.e., an activity that on its own will give them an advantage).** We should also **encourage them to interrogate their motivations for engaging in research**, and for those students who are motivated by a genuine interest in the subject matter or just a desire to learn more about the process, **encourage them to think about "research" broadly**. Students will be most successful (at both the task and incorporating it into their applications) if they choose a project that is well aligned with their interests or goals, even if their work is outside of the clinical or biomedical sciences.

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