

Strategies for Making Research More Accessible to Dental Students

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Abstract: Increasing student involvement in research has potential rewards for both faculty and students. Both groups have demands on their time, interest, and commitment that frequently result in low student research activity. Dental schools can make research more accessible to students by increasing student understanding of the importance of research, establishing rotating research positions, providing compensation, pursuing projects that interest students, and providing time in the curriculum for research by restructuring the basic sciences curriculum during the first two years of dental school. No attempt to make the research process easier or more accessible should compromise the integrity of the scientific process, but increasing students' research involvement will pay long-term dividends for dental schools and the profession.

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During a joint meeting of the American Dental Education Association's Councils of Deans and Students in 2004, a panel discussed research at U.S. dental schools and the importance of student involvement. This article is based on ideas I presented during that meeting. As an overview, this article has three primary messages: 1) research is essential for the future and vitality of dental education; engaging students in the endeavor has many positive rewards for both the school and student, 2) but many obstacles keep students from participating and 3) schools can make the process more accessible to students.

The purpose served by research varies based on which party is asked—dental school faculty or students. Both groups would support the following purposes: further the science of dentistry, increase the base of scientific knowledge, and make new discoveries leading to improved patient care. While these reasons for research are laudable, both schools and students approaching research also have some additional motives. Dental school faculty would possibly include the following as reasons for supporting student research programs: development of critical thinking in students, furthering school-mandated research objectives, providing mentoring for students, and faculty recruitment. Based on my experience, dental students would list the following reasons for doing research in school: gaining experience

in a laboratory, expanding knowledge in a particular field of interest, or testing the waters for a research career. Perhaps not surprisingly, however, most students appear to pursue research in preparation to apply for a residency program, make faculty contacts, and receive financial compensation.

While the reasons behind supporting student research programs differ somewhat for faculty and students, they are not mutually exclusive. The needs of the educational institution must be met while at the same time accommodating the student researcher. However, no attempt to make this process easier or more accessible should compromise the integrity of the scientific process.

The first step in making research more accessible to students is a solid institutional commitment to research. Good student research programs represent a large commitment on the part of the school, as it has been estimated that a program including only 25 percent of a class could cost over \$100,000 annually.¹ With budget shortfalls ever-present, a tangible result from such a commitment would do much to improve an institution's willingness to support research on a larger scale. Rosentiel and Johnston¹ found in an alumni survey completed at seven to ten years postgraduation that those who had done student research were three times more likely to complete advanced training, five times more likely to become dental faculty, and 31 percent more likely to

be financial donors to the school. With a continuing low amount of graduating seniors entering academic dentistry, there is great potential for recruiting new faculty through research.

To many students intent on entering private practice upon graduation, research may seem daunting, boring, and removed from “real” dentistry. The attitude that an institution takes toward research will shape the attitude of the student. If research is promoted as a viable facet of the education experience, rather than additional punishment some students take on, then it will be more palatable to students. Bertolami² asked the question if dental schools share the research vision of their parent institutions. In reviewing a list of 3,000 universities that had received NIH support prior to 2002, he classified about 150 of those institutions as research intensive. Of those, only forty-five included a dental school as part of their university structure, usually as a component of an academic health center. When looking at these research elites, it is notable that several of these universities have closed dental schools in recent years (Northwestern, Emory, Georgetown), but not one has opened a dental school. Do dental schools share the research vision and commitment of their parent institutions? Gaining or improving that vision will show dental students that research is valuable and temper student attitudes toward research.

Increasing student involvement in research could have very promising rewards, but making the endeavor more accessible, even easier, is necessary to getting more student interest. Here are some suggestions, discussed below, as to how research could be made easier:

- increasing student understanding of the importance of research
- ready-made, rotating research positions
- compensation
- interesting projects
- TIME, TIME, TIME

Many students know that there is some connection between research and patient treatment, but few probably know what that connection is. A solid understanding of the role that research plays in developing clinical procedures and materials would shift student thought from the traditional view of lab research into the realm of treatment. Faculty can help increase this understanding by applying research in laboratory and clinical settings. Faculty are busy, and when faced with a question of why a student should cut a prep one way versus another way, use a certain material, or use a specific instrument, find it easier and faster to say something like “that is the way that

works best for me” or “that is how everybody does it.” If faculty members could take the additional time to reference a particular study or theory that supports their advice, it would help students see the role that research plays. Another way to increase understanding is through introducing research in the first-year curriculum in a non-stressful and interactive manner. At Virginia Commonwealth University, all dental students take a scientific inquiry course during the first semester. This pass/fail course places students in groups that study research related to common questions the public has for dentistry. The groups find and analyze research in primary journals and present their findings at the completion of the course in oral presentations. Students are able early in the curriculum to see that research answers many questions they will face as practitioners.

Many students come to school with little or no experience with laboratory-based biomedical research. The idea of going lab to lab and asking professors to have mercy and allow them to do something that they know nothing about can be frightening to many. Schools can create environments that allow promising students who are interested in research to transition into a research program. One example is a rotating position in a laboratory. First-year students can spend a specified amount of time in training that is blocked out in their schedules so it does not compete with coursework; then as sophomores, they can serve as assistants to upperclassmen; and finally, they can work as a researcher with their own project. This is only one idea, but schools can gather interested professors and create a program that recruits students to research, rather than having students try to recruit professors to their cause. A well-organized student research group, led by faculty, may be an excellent tool for advancing student research at dental schools.

Students are busy in school, but have lives outside of school as well. Many have spouses and children, leading to an increasing burden of debt that potentially does not even cover their expenses. For financially strained students, any extra time is most likely to be spent with family or working a part-time job to support them. Compensation thus is not only an enticement, but a necessity for some students. Compensation can come in the form of a stipend, wage, or scholarship, but some students may also become interested in goal-oriented compensation, such as publications or chances to attend conferences.

If a student is interested in a research idea, conducting a research project will be an easier and better experience. This is not necessarily because the

project is easier, but because anything is more bearable if the person wants to be involved. In speaking with classmates, I heard many say that they did not want to do research because they did not want to be at a microscope all day. The scope of research is so much larger than that, but many students are not aware of research options. The University of Connecticut Dental School held a workshop on product-oriented research³ that exposed students to ways they could participate in the development of new products that could enter the market. The students in attendance completed a survey that showed they would be interested in this type of research. Survey results showed that students who had quit working in basic science labs said that they would return to research and even do research past graduation if their work could visibly influence their treatment of patients. Recently there has been a large emphasis in the ADEA Council of Students on educational research. Many students have responded positively to the idea that they can investigate the educational process at their own school or nationally. Not all students are made for the basic science lab, but many students can be made aware that such research is only one aspect of the greater whole.

Perhaps the largest impediment to students doing research is time. There is not enough time in most curriculums to accommodate a substantial research experience. Some possible resolutions are allowing students to test out of early basic science courses, offering elective credit for research, or mandating research periods. It is my opinion that, to really change the time structure, there needs to be massive curriculum reform, particularly in the first two years of dental school. The prerequisites to application for dental school have not changed in years, and many basic science courses could reasonably be moved to the pre-dental course load. This would decrease redundancy in the dental curriculum, improve the quality of applicants, and most importantly allow students more time, ideally for research or clinical experiences.

Many of the basic science courses teach specific elements of the same systems. To set a background for lectures, professors will teach or reteach a system in order to then focus on details. The result is that a system such as the GI tract is taught with much overlap in biochemistry, anatomy, physiology, histology, and microbiology, among others. If the above basic science courses were moved to before dental school, it would do much to decrease needless repetition and to increase time for directly relevant dental issues. Portions of these classes do have dental specifics and also need emphasis for the cur-

rent dental board examinations. To facilitate those academic needs without refilling the time void left by moving these classes to the undergraduate years, a dental sciences course could be created. Such a course could meet a few times each week and in an integrated manner cover the dental-relevant material that was previously taught in multiple courses. Using a team-teaching approach, students could spend their time reviewing what they have already learned before dental school and focus on dental issues in the basic sciences. Thus, not only is time created for research, but students are able to really gain an understanding of scientific principles.

The large benefit of moving many basic sciences out of the first and second years is extra time for more enriching educational experiences (such a move at Virginia Commonwealth University could create eight to ten hours of new time per week). The benefits of such an approach are better applicants to dental school, decreased course redundancy, and increased understanding of the biomedical basis for oral health and oral pathology by students. Students need time if they are going to do research; better structuring of the basic science curriculum in dental school would give it to them.

The goals of this article were to demonstrate the utility of large student research involvement and propose ways to make research more accessible to dental students. While some of the ideas presented may be viewed as optimistic or idealistic, the fact is that traditional and outdated educational policies need not be the norm. If schools really want more students to do research, they can make it happen by making it easier for students to participate. Increasing student research will produce better clinicians, better scientists, and better professionals.

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