

# Innovation and Entrepreneurship

## *Biodontics: Dental Students as Change Agents for Dental School Curricula*

*"It is not the strongest of the species that survive, not the most intelligent, but the one most responsive to change."*

—Charles Darwin (1809-1882)

Change is a complex process both for species and for institutions. Species change by mutation. If the mutations have survival value, the new mutated species survives; if not, the mutant becomes extinct. Institutions often change by adaptation; the mechanisms for adaptation are individualized and depend on the institution. For example, corporations use board meetings, governments use elections or palace coups, and religions use divine intervention. Dental school faculties, in making change to their curricula, use a combination of all 3 adaptation mechanisms. However, dental schools probably rank second only to governmental institutions in their resistance to change.

In my 30 years as a faculty member, I have seen all 3 mechanisms at work. I have attended numerous dental faculty committee meetings convened to either update or revise a dental school's curriculum. These meetings remind me of the game "3-Card Monty," in which an ace and 2 other playing cards are placed face down and moved rapidly from one position to another. The object of the game is to find the ace, but only rarely is it correctly located. Similarly, at faculty meetings convened to

consider the introduction of a new course, the existing courses are moved from one time slot to another so rapidly that tracking the changes is difficult and locating the "ace" is almost impossible. It is only later, when the syllabus for the new curriculum is completed, that the new course is found buried to the point of obscurity among the curriculum's previous offerings. In this way, curriculum revision meetings become more of a 3-Card Monty curriculum shuffle than an actual revision.

### External Mechanisms Influencing Curriculum Change

Suggestions for dental school curriculum changes are most often made by authoritative sources. For example, the American Dental Association, through the process of accreditation of US dental schools, makes recommendations for what it perceives as improvements. The American Dental Education Association (ADEA) also makes recommendations. A recommendation by the ADEA for a course in ethics resulted in several dental schools introducing this topic into their curricula. Whether these courses have been successful has been the topic of debate, with some believing that these courses, while mandatory, are not achieving their goal.<sup>1</sup>

Curriculum changes also can be initiated by organizations that provide funding for research and training. For example, in response to a recent article that argued for increased education in genetics for dental health professionals,<sup>2</sup> Francis Collins, director of the National Institutes of Human Genome Research, and Lawrence Tabak, director of the National Institute for Dental and Craniofacial Research, concurred that more emphasis on genetics education is needed in US dental schools.<sup>3</sup>



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## Dental Students as Change Agents

While dental school curriculum revisions can begin with the dental school administration, a grant from a governmental or nonprofit agency, the palace coup is most effective in bringing about curriculum change. However, the coup rarely originates from the faculty or the administration. In my experience, it is a “revolt” by the dental students that is the precipitating factor. Today, student-initiated coups can influence curriculum change more so than was possible 30 years ago.

One reason might be that dental schools provide more opportunities for students to comment about the curriculum through surveys and course evaluations. Another reason, and the one I favor, is related to the Internet. Today, students at one dental school communicate on a daily, if not hourly, basis with their counterparts at other dental schools. Through chat rooms and instant messaging, and sometimes during lectures, students share experiences and realize that changes considered radical at one school are already in place in another.

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***Because most dental students graduate without any appropriate product and technology evaluation education, they are unprepared to make informed decisions on equipment purchases and on their proper use. .***

## Implementing Change

Faced with the threat of a palace coup, or more appropriately a suggestion by students for a new course to be added to the curriculum, how might the faculty and administration respond? At most dental schools, there are 2 mechanisms available for introducing new material either making it mandatory and therefore squeezing it into an already overcrowded and compromised curriculum or making it optional: as an elective. In most dental schools adding mandatory courses can be time-consuming for the faculty because each faculty member has a personal opinion and interest. Therefore in the case of a mandatory change, the larger the faculty, the longer the implementation process can take. In contrast, most schools can introduce electives at the request of students and with the support

of a faculty sponsor. Using this mechanism, most dental schools can approve an elective in a few weeks and implement the new course almost immediately.

## What Do Dental Students Elect?

Several years ago I asked Bruce Donoff, Dean of Harvard School of Dental Medicine, what dental students want in terms of curriculum. His reply was, “Listen to the students.” Students are confused by the difference between what is taught in dental school clinics and what they see and learn about on the “outside” from those in practice. Simply put, in some dental schools, the products and services offered are not the latest, and students are seeking to close the gap.

Dental schools are only now beginning to require students to complete at least one implant case before graduation. Few dental schools expose dental students to lasers, and perhaps even fewer to computer-aided design, computer-aided manufacturing technology. Dental students are certainly aware of these new technologies and products from reading about them in trade journals, learning about them at trade shows, and seeing them used in private practices. While it is true that some of these students will learn to use these products in residency programs, others will not, and are frustrated that they are not included in their dental school education. Today, many students will graduate without having used these products, and yet will have to introduce them into their practice immediately if they are to provide the oral health care that many patients expect. Unprepared to make informed decisions on equipment purchases and on proper use, these recent graduates will be compelled to take advanced courses at additional expense.

## Including the Dental Industry in Dental Curriculum Reform

If the dental profession is to provide the best possible education for its students and care for its patients, it is imperative that the dental school curricula stay current with the latest in new products, technologies, and services. The question is how best to accomplish this goal. In the past, it was sufficient to rely on the dental faculty to keep current, either through their clinical research or through continuing education courses. However, in the last 10 years, the amount of

time a faculty member can devote to clinical research and the time allocated for continuing education has declined. One consequence is that another source of information is urgently needed to keep the faculty apprised of new developments. What other source might be available?

One group noticeably absent from the list of those making suggestions for new courses and changes to the dental school curriculum is the dental industry. Since the merger of the 2 dental trade organizations into one, now called the Dental Trade Alliance (DTA), most of the dental companies, including manufacturers and distributors, are represented by one entity. It is surprising that the DTA is not consulted regularly on curriculum, because it has access to the most recent technologies and products and, through its members' sales records, is cognizant of what is in use in private practice.

A collaboration between the DTA and dental schools would allow today's dental students to be exposed to new products and technologies under conditions where their activities can be monitored, and when necessary, corrected by those most able to provide this instruction: the clinical faculty of our dental schools.

### **Biodontics: An Elective to Introduce Curriculum Change**

The question is not "Is change in the clinical dental curriculum necessary?" but "Can we develop a method to facilitate and encourage change?" We need to experiment and find a mechanism to provide students, faculty and policy makers to introduce change into the dental curriculum rapidly and with appropriate oversight. Most of all, we need to encourage

our students, faculty, and policy makers to become innovators of educational change. One experiment in curriculum change is ongoing at the University of Connecticut School of Dental Medicine. In July 2005, Biodontics, a new 4-week educational program, was offered as an elective that provides students with exposure to new products and technologies. Biodontics is supported in part by a grant from the National Institute of Dental and Craniofacial Research, and in part by dental companies on a volunteer basis.

We hope that this course, by encouraging dental companies to participate under supervised conditions, will keep the clinical dental curriculum dynamic, thus avoiding stagnation. The goal of the Biodontics program and all innovative approaches to dental education is to be responsive to the innovative suggestions of students, faculty, and the profession and equally as important, responsive to changes in our society, especially as the demographics of our population change.

### **References**

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3. Collins F, Tabak L. A call for increased education in genetics for dental health professionals. *J Dent Educ.* 2004;68:807-808.

*Any dental manufacturing, distributing or marketing companies, as well as dental laboratories, interested in participating in the 2005-2006 Biodontics educational program should contact Edward F Rossomando at [erossoma@nso2.uhc.edu](mailto:erossoma@nso2.uhc.edu).*

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