

We already have new technologies at our disposal and a new type of learner ready to embrace them.

In this month's letter, Dr. Rick Valachovic, Executive Director of the American Dental Education Association, imagines how emerging technologies and the future of practice may spur the evolution of dental education.



The Not So Distant Future: Dental Education in 2050

Imagine the year is 2050 and you've arrived for your annual physical examination. It has some things in common with the one you received 40 years earlier, but the gestalt of this visit is entirely different. It includes a series of informative encounters ... with nurses, physicians, dentists, pharmacists, dental hygienists, and other professionals. They review your electronic health record and screen you for a menu of minor systems-related changes that may be very early precursors for manifest disease. While the lab analyzes your saliva for cancer, cardiovascular problems, and other systemic diseases, you talk with your primary care provider about some recent stomach pain. Your vision is screened, you have a dental prophylaxis, and then you ask whether growing a new tooth for the one you lost in a recent accident might be a viable treatment option. You leave with a dental plan, new reading glasses, a pain medication that shouldn't upset your stomach, a nutritionist's advice on improving your blood sugar levels, and an appointment to consult with a dental implant specialist via the Internet.

In some settings, we're already beginning to deliver this type of integrated care. In others, electronic health records are making it possible for providers to get a fuller, more up-to-date picture of their patients' health. In some remote communities, telehealth is bringing routine health advice and expert opinion into homes and hospitals in medically underserved areas. And by 2050, all of this and much more will have become part of the contemporary health care landscape.

That's a wake up call for health professions educators, and our member institutions are no exception. The majority of us on faculties are still teaching the same way we have for generations. That can't go on forever. Already today we have new technologies at our disposal and a new type of learner ready to embrace them. Teaching will have to change to accommodate both.

Today's dental and allied dental students and residents differ from those of us from my generation (I graduated from UConn in 1977) and others by virtue of their fluency with digital technology and their connectedness with the wider world. Pollster John Zogby, in his new book [*The Way We'll Be: The Zogby Report on the Transformation of the American Dream*](#) dubbed today's 18- to 29-year-olds "First Globals" because they are "the most outward looking and accepting generation in American history." If so, this represents a dramatic paradigm shift. These highly self-directed learners don't need us to feed them information. They have a world of information at their fingertips. This moves teachers away from their traditional role as gatekeepers to knowledge, but that doesn't make teachers irrelevant. Instead it opens up a new role for faculty as gifted mentors in both academic and clinical settings.

So what will the academy of the future look like? You may not be able to see it at all. In a wired world, where we can share information digitally, reduced costs and increased convenience may well trump the perceived benefits of bringing students, residents, and faculty together under one roof. Already two-thirds of two- and four-year colleges deliver some or all of their courses online. Twenty-percent of graduate programs did the same in 2001, and that number is on the rise. Each year more and more institutions adapt portions of their curriculum for electronic delivery. In some systems, education is distributed across campuses, allowing students to remain in

their home communities, and creating the conditions that encourage them to practice there as well.

Dentistry has not yet been quick to adopt distance learning, but our colleagues in allied dental education are already moving down that path, as are those in pharmacy, nursing, and other disciplines. (For more, see the [September 2008 Charting Progress.](#)) Some schools and programs are working toward a more distributed model, and it seems inevitable that asynchronous learning will continue to gain importance, forcing more schools and programs to follow suit.

The faculties of tomorrow will also evolve. They will become more interdisciplinary in keeping with the practice community, and they will represent expertise in areas we can only start to imagine. The knowledge needed by the clinician of 2050 will extend well beyond the bounds of what my generation learned in school. As knowledge expands with a dizzying rapidity, professors of diagnostics, genomics, informatics, and new sciences that have yet to fully develop may all play a part in educating future generations of practitioners.

What about clinical education, you ask? Virtual technologies are already under development to reduce the amount of time that our students and residents need to spend working directly with patients during the early periods of their education and training. Of course, hands-on experience with patients will remain an essential part of our educational models. While most clinical dental education is currently delivered within the footprint of academic dental institutions, by 2050 a great deal of it will have moved to sites in the community. This will be motivated in part by a desire to reduce costs, but it will also have tangible benefits for those in our academic programs and those in underserved communities. Students and residents will be able to observe and treat a greater variety of patients, and through their service clinics that serve those with limited or no insurance will have the opportunity to expose more potential recruits to careers in the dental, allied dental, and advanced dental professions.

Indeed it's possible that some academic dental institutions will eliminate their bricks and mortar facilities entirely, but that doesn't mean they will cease to exist. Our institutions will continue to coordinate and validate the educational experience, but our physical facilities may be reduced to the size of an old-fashioned telephone booth. In other words, they will become communication hubs with their professors and learners distributed in ways that suit each individual best. With a shift to the use of community-based facilities for clinical care, this reality need not be far away.

One major advantage of an arrangement of this sort would be that students and residents could learn at their own pace. Highly capable individuals who are able to pursue their educations full-time might easily attain competency in a short period of time, while others could complete their programs at a pace that would accommodate work or family obligations. So long as individuals gain the competencies they need to be competent practitioners, the duration of their education would not matter, putting to rest arguments about the appropriate length of an education program.

By 2050, I believe that our academic dental institutions will also have placed greater emphasis on positioning themselves as a resource for lifelong learning. In the past, dental knowledge was relatively static, but tomorrow's general dentists, specialists, and allied dental professionals will need to continually adapt their practices to incorporate new knowledge. [MedEdPORTAL](#), a collaboration between ADEA and the [Association of American Medical Colleges](#), is already allowing faculty, students, and residents from around the world to share content in new and creative ways. Other organizations, including ADEA, offer a range of opportunities for acquiring continuing education credits, and future offerings will undoubtedly be even more diverse. With a distributed model, it should be possible for individuals to acquire new knowledge independently and to receive highly specialized mentoring and skills training from individual professors or clinicians.

By now you may be saying that's all well and good, but how I will know that learners have gained appropriate competencies and are ready to embark on their professional careers? This concerns me as well. I believe that assessment will play an even more vital role in the educational system of the future. With less face time between professors and learners, we will need truly reliable methods of assessing competency to ensure that our students and residents are ready for independent practice in their respective fields. The [ADEA Commission on Change and Innovation in Dental Education](#) (ADEA CCI) and many of our members have been working assiduously on this last piece of the puzzle for some time now, and I'm confident that many of the tools we need already exist in preliminary form. We'll all have a chance to explore this topic further at the ADEA Annual Session in 2010 where we will focus on assessment.

Clayton Christenson, the Harvard Business School Professor known for his theory of disruptive innovation, has come out with a new book coauthored with Michael B. Horn and Curtis W. Johnson. In [Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns](#), the authors foresee an educational system in which technology facilitates customized learning for students. In their view, it's not a question of

cramming new technologies into the existing educational structures, but of allowing them to take root in a model that changes the way we operate.

I agree that our educational systems must evolve to meet the changing needs of our learners and the practice world that lies ahead. 2050 may seem a long way off, but it's not that far into the future. Change is already on the way. Let's rise to meet it.



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