

With a sound pedagogical approach, the right technology, and adequate preparation, we should be able to ride these waves to a promising horizon.

In this month's letter, Dr. Rick Valachovic, Executive Director of the American Dental Education Association, looks at how our colleagues in U.S. pharmacy and nursing education and British dental education are moving their programs online.



Catching the Waves of e-Learning and Distance Education

Determining the best ways to teach future generations of dental professionals is no easy task. It's not just a matter of what we teach; it's also a matter of how we teach it.

Today's students enter our schools and programs with different expectations than earlier generations brought to their professional studies. They want Internet access to professors, course materials, and resources that support their learning. Many of them need flexibility to continue working, caring for family members, or managing other personal demands. For many educational institutions, the answer to these developments has been e-learning.

These new approaches are emerging in our own community. For example, this fall Tufts University School of Dental Medicine begins a Master of Science program allowing dentists to obtain the degree from any location in the world. In allied dental education, distance education is especially widespread. Offerings range from one or more courses to entire programs, and are most prevalent in baccalaureate degree completion and graduate programs.

This past January, the University of Michigan (UM) began offering a dental hygiene degree completion program entirely online. UM did not simply transfer its established degree completion program to the Web. Instead, the school formed teams to create entirely new courses tailored specifically for online consumption. Faculty were invited to collaborate with technology and instructional design experts to determine how best to present content online. The process was so successful that faculty are now incorporating Web-based practices into their on-campus courses as well.

Students in the program must have already completed an associate's degree in dental hygiene, so there are no clinical components that would require students to spend time on campus. However, UM does require a two-day on-site orientation. According to E-Learning Program Director Anne Gwozdek, "It's one of the best things we've done. It has provided a sense of community among the students, and they tell us that we faculty are a strong presence for them—not as teachers in the traditional sense of the word, but as guides."

UM's program is already drawing students from out of state. Gwozdek told me that 70% of dental hygienists with associate's degrees are interested in earning baccalaureate degrees, but most are unable to leave their communities and jobs to pursue higher education. This bodes well for the growth of online programs, which Gwozdek also believes will bring new blood into faculty ranks.

Some of our colleagues in the other health professions are also deeply involved in online education. Since they face many of the same challenges we face in dental education—the need to provide hands-on, clinical instruction; an increase in the number of second career students; and a worsening faculty shortage—it is useful to see what we might learn from their experiences.

Since 2001, Creighton University in Omaha, Nebraska, has offered two pathways to the Doctor of Pharmacy (Pharm.D.) degree, one on campus and one [online](#). Creighton's distance pathway is a full-time, four-year program equivalent to the campus pathway. Students take didactic courses at home over the Web and

come to Omaha for two to four weeks of intensive laboratory experiences each summer. They spend their fourth year in clinical rotations in Omaha or near their home base with affiliated clinical sites.

Although Creighton's pharmacy program is consistently ranked as one of the top private university pharmacy programs in the country, the school's initial foray into online education raised some eyebrows. "Frankly, I was skeptical when I initially heard about this program," says Dr. Chris Bradberry, who became Dean of the Creighton University School of Pharmacy and Health Professions in 2003. "But having witnessed it close up for five years, I'm impressed by the students and by the use of academic technologies. Our students have a tremendous work ethic, and they're very focused."

According to Chris, the primary impetus for developing the distance pathway was Creighton's desire to reach "place-bound" students. The distance pathway students are on average eight years older than their campus counterparts and have already put down roots in their communities. Some have degrees in another health profession and are pursuing pharmacy as a second career. Preference in admissions is given to students from rural areas with shortages of pharmacists. "Probably 50% of the counties in our state have fewer than five health practitioners of any sort," Chris tells me, "and it's similar throughout the upper Midwest."

Creighton admitted its first class of fifty students in 2001. From what Chris has heard, there were some challenges at first. The large class size created logistical problems, and the school could have used more time to ramp up the program. Some professors were resistant to the idea of teaching over the Web, and the entire faculty and staff faced a steep learning curve when it came to gaining proficiency with the new technology. It also took time to fully develop the IT infrastructure needed to run the program smoothly and offer a full range of educational experiences to distance pathway students. Since then, automation of the video capture process for online lectures and the addition of conferencing software have greatly enhanced the faculty's ability to work one-on-one with students and nurture their communication and critical thinking skills.

Last year, the applicant pool for the distance pathway doubled, leaving Creighton in the enviable position of having to choose among 500 applicants for 55 seats. It appears that the word is out that this is a legitimate program, and the fact it received full accreditation in 2006 no doubt substantiated that in the eyes of many.

An article in the *American Journal of Pharmacy Education*, "[Using Performance-based Assessments to Evaluate Parity Between a Campus and Distance Education Pathway](#)," reviewed assessment data on first- and second-year Creighton pharmacy students in both the campus and distance pathways. They were statistically equivalent in their academic and clinical performance. They also scored similarly on the licensing board exams, further validating the idea that distance education can be just as good as that received on most campuses.

One side benefit of Creighton's distance-learning experience has been its inspirational value. Nearly a dozen faculty members are taking advantage of their involvement with this pioneering venture to conduct research in teaching and learning.

Creighton's innovations have not come cheaply. Since the start of the program, the School of Pharmacy has expanded its IT staff to sixteen and hired thirty additional professors. Chris acknowledges that the expense involved may pose a formidable barrier to other universities hoping to start similar programs. In fact, Creighton remains the only university in the country offering the Pharm.D. degree via the Web, but interest in the idea is spreading nonetheless.

What advice does Chris have for other health professions schools thinking about starting online programs? Start early, start small, and be prepared to make a substantial IT infrastructure investment. "We owe a great deal of our success to the strength of our IT infrastructure. It gives us the ability to do what we want pedagogically and to use our own communication model. These things would not have been possible if we had tried to work within the university's IT infrastructure."

This fall, Creighton is starting a distance program for occupational therapy students at the request of the [University of Alaska Anchorage](#). A pilot group of eight students has already begun its studies. Creighton has hired preceptors in Anchorage to oversee clinical training and lab work, and the University of Alaska has hired a full-time faculty member to act as a liaison with Creighton.

Creighton's decision to launch a distance pathway precedes a faculty shortage in pharmacy education, but our colleagues at King's College London Dental Institute (KCLDI) embarked on a similar initiative in response to a faculty shortage. [KCLDI](#) is the largest dental school in the United Kingdom. It is leading an effort to ensure best practices in dental education by creating a virtual learning environment that seamlessly integrates all components of the teaching and learning process.

The project is called the [International Virtual Dental School](#) (IVIDENT). It aspires to become a self-sustainable, nonprofit enterprise that will deliver all aspects of dental education through a flexible online environment.

IVIDENT's Flexible Learning Platform (FLP) will give associated schools and organizations access to a globally distributable learning resource. This will initially focus on the smaller specialties such as Oral Radiology, Anatomy of the Head and Neck, Basic Pathology, Human Disease, and Oral Medicine. The current KCLDI distance learning master's programs will also benefit from using IVIDENT's [integrated tools and systems](#). The FLP will give educators the capacity to create, control, and maintain educational content; record and monitor student assessments; and communicate with and support students. Students will have access to lectures, tutorials, examinations, a virtual library, and support services. Although students will still need to do the clinical components of their education on site in a blended clinical environment, IVIDENT will eventually integrate robotics and virtual reality devices that can accurately record students' progress and provide feedback. In collaboration with the University of Michigan, 3D virtual world tools such as "Second Life" will also become an option.

IVIDENT's developers envision that partnering institutions will be able to optimize their use of teachers and resources by minimizing repetitive tasks, allowing faculty to focus their talents where they are most needed. IVIDENT is also designed to foster collaboration across schools, so that faculty can share expertise, contribute teaching resources, and ultimately reduce the teaching load.

Can IVIDENT alone address the faculty shortage, especially in the most hard-pressed specialties, while ensuring the best practices in dental education? I recently caught up with Dr. Patricia Reynolds, Professor of Dental Education and Director of the Centre of Flexible Learning in Dentistry at KCLDI. She told me that IVIDENT does not claim to have all the answers. Nevertheless, she is convinced that limiting ourselves to traditional approaches will not suffice in a modern educational world.

IVIDENT is currently piloting its initial FLP within KCLDI and it will be further tested with the founder partner institutions in England, the Universities of [Portsmouth](#), Bristol, and Belfast, and the Eastman Dental Institute of University College London. When fully developed, IVIDENT plans to extend its resources to schools in the developing world. This is very much in the spirit of the International Federation of Dental Educators and Associations, commonly known as IFDEA, whose Global Knowledge Centre (GKC) pools international intellectual resources and expertise for the worldwide dental education community, including [a listing of all known "open courseware"](#) (free course content and materials) focusing on dentistry and health.

Now let's cross the Atlantic one more time, landing in the port of Baltimore. As you may know, distance learning and the use of simulation have become well established in nursing education. Perhaps you have also heard that nursing schools face an acute faculty shortage that is seriously limiting enrollments, so again our community may have something to learn from their experience.

[The University of Maryland School of Nursing](#) (UMSON) boasts one of the most technologically advanced facilities in the country. UMSON has twenty-four simulation labs, the equivalent of a 124-bed hospital. They include everything from an operating room to a neonatal intensive care unit. The school also offers almost eighty online courses. I wondered if this high-tech approach helped UMSON overcome its need for more faculty, so I asked Dean Janet Allan.

"Online courses are wonderful for reaching students living far from a campus or with work schedules that are difficult to manage," she told me, "but they don't increase faculty capacity. In fact, they do just the opposite." UMSON has a ratio of one faculty member to twenty-five students in its online courses because they incorporate interactive learning techniques that are labor-intensive for faculty but key to effective, high-quality instruction. By contrast, a campus-based pathophysiology course is offered in a lecture hall to 170 students with one teacher and one teaching assistant. "Online courses don't save money, and I think people are starting to realize that," Janet said.

UMSON also televises courses to satellite campuses, where it has about 300 students. This approach does save on faculty time, but Janet says students are less receptive to learning this way. "The convenience of online courses is what students want."

This perception echoes IVIDENT Director Pat Reynolds' view that e-learning methods are becoming the norm, and that (ready or not) we need to adapt to this reality. In her view, "E-learning requires a cultural shift in teaching methods, with a blended approach preferred. The institution and teachers must also shift from a 'sage on the stage' approach to a 'guide on the side' whilst keeping the student at the center of the experience."

I have no doubt that dental education on our continent will soon wade deeper into

the distance and e-learning waters as well. We should be alert to the experiences of our colleagues, so we aren't tossed about in rough seas. With a sound pedagogical approach, the right technology, and adequate preparation, we should be able to catch the e-learning wave and ride it to promising horizons in dental education.



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