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DR. MARKUS BLATZ

TECH**INITIATIVES**

ADVANCING DENTAL EDUCATION THROUGH INNOVATIVE TECHNOLOGY

OPPOSITE: As part of a new online learning initiative, a Digital Impressions website, accessible on iPads, was established with mobile apps. It currently features nine apps, including Canvas learning management system, MediaSite for online lectures and tutorials, ExamSoft for test-taking, and Browzine for academic journals.

THIS SUMMER, DR. KELLY JORDAN-SCUITTO, Professor and Chair of Pathology, helped pilot a new online testing program for students in her pathology course that allowed her to incorporate images right onto the computer screen, easily assess how well the class was learning the material, and provided students with almost immediate feedback on their performance.

The online testing program, ExamSoft, is just one of a number of new educational technology initiatives being implemented or explored to ensure Penn Dental Medicine continues to provide the best possible education and experience for students, while utilizing the latest educational methods, tools, and technology available.

"To stay at the leading edge of dental education, it's important to adapt our teaching methods to new technological standards and digital platforms," says Dr. Markus Blatz, Chair, Department of Preventive and Restorative Sciences, who last year was tapped by Dean Denis Kinane to spearhead the School's online curriculum initiatives and serve as chair of an advisory committee on the topic. "Information is being delivered very differently than even five or 10 years ago," says Dr.

Blatz. "Traditional lectures and conventional textbooks have become less effective teaching tools these days when an abundance of up-to-date information is readily available with just a mouse click."

Recorded lectures and tutorials, so-called flipped classrooms, and a full complement of mobile apps are all part of the new online learning initiative. This fall, as part of a pilot, all 120 freshmen were provided with iPads so they have a uniform platform to access all learning technology systems and applications while at Penn Dental Medicine. The Digital Impressions website accessible on the iPads currently has nine apps, including the Canvas learning management system, MediaSite for online lectures and tutorials, ExamSoft for test-

taking, and Browzine for academic journals. Others will be added as additional technology initiatives advance.

To help carry out these new initiatives and continue to stay ahead of the technology curve, two new positions have been dedicated to this effort. Chia-Wei Wu started September 2 as the School's first Associate Director of Online Curriculum Design. Wu, who holds a Master of Science in Education in Learning Sciences and Technologies from Penn's Graduate School of Education, brings expertise in blended learning systems and online learning environments, such as Massive Open Online Courses and other instructional design. He has also served as a high school chemistry teacher, which inspired him to start JSchool, a K-12 online learning platform.

In this new position, he is working closely with Maria Mejia, a five-year veteran of Penn Dental Medicine's IT department, who on July 1 assumed the new role of IT Director of Learning Technologies. In this position, she is charged with leveraging the effective use of technology opportunities in learning and teaching from the classroom to the clinic and is coordinating the efforts of the IT Learning Technologies Team.

ABOVE: To help carry out these new learning initiatives and continue to stay ahead of the technology curve, two new positions have been dedicated to this effort. Chia-Wei Wu is the School's first Associate Director of Online Curriculum Design, working closely with Maria Mejia, who has assumed the new role of IT Director of Learning Technologies.

A NEW LEVEL OF COMMITMENT

Penn Dental Medicine has been incorporating new learning technologies into the curriculum for some years, but these recent efforts and people to support them mark a new level of commitment.

"It was clear from the start that we needed a dedicated team of experts to move in this direction more forcefully," Dr. Blatz notes. Besides himself, Wu, and Mejia, the committee on online curriculum initiatives also includes Dr. Anh Le, Chair of the Department of Oral and Maxillofacial Surgery/Pharmacology and Norman Vine Endowed Professor of Oral Rehabilitation; Dr. Helen Giannakopoulos, Associate Professor of Oral and Maxillofacial Surgery/Pharmacology; Dr. Frank Setzer, Assistant Professor of Endodontics; Dr. Syngcuk Kim, Interim Chair and Louis I. Grossman Professor, Department of Endodontics; and Jeff Fahnoe, Senior Director of Planning and Operations.

In addition to assessing and implementing the most promising technology initiatives, training faculty to make the best possible use of the new initiatives is critical. On-going training sessions as well as one-on-one support is available to help faculty make the best use of existing resources and choose the most appropriate tools for their teaching goals. They can access information about training and other efforts to support faculty in adopting new learning technologies through the Learning Technologies Community Site on

Canvas. "We want to make it as easy as possible for faculty," Mejia says.

There are many ways large and small in which online learning and technology can be incorporated into classes. Consider flipped classrooms, in which at least some of the traditional lecture content typically is provided online and faculty and students use class time to actively engage in small group discussions or learning activities. In this model, "students are not just sitting there taking notes," Wu says. "This frees up time in class for collaboration and small group discussions. The instructor has more time to make sure there are better learning outcomes."

Educational research supports the notion that there are positive outcomes "when students teach each other and learn from each other," Wu adds.

Currently, two of the largest lectures halls at Penn Dental Medicine have cameras built in for recording lectures, but Mejia says they are getting more requests from faculty who want help producing short lessons and vignettes with higher production values and strong narratives. "A boring

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> MARIA MEJIA

lecture doesn't become more interesting just because it's online," Dr. Blatz notes.

The appeal of viewing lectures and other content online and on one's own schedule is strong. Mejia said last year alone there were 70,000 views of recorded lectures, clinical procedures, instructional videos, and other materials through the MediaSite video content management system.

In addition to allowing for more specialized use of in-class time, teaching videos offer students more control over how they view the content — giving them the ability to speed up through some sections and rewind to go back over more challenging concepts. And because they now have the

ability to track how students are viewing online content, Wu says faculty members can see which concepts or topics students are watching multiple times.

"It gives them insight into the behavior of students watching the video," he notes, which, along with other data available, allows faculty members to tailor their curricula to better meet the learning needs of students.

Meanwhile, the pilot for ExamSoft will continue throughout this academic year for all freshmen and a few sophomore courses. Dr. Uri Hangorsky, Associate Dean for Academic Affairs and Director of the PASS Program, one of those instrumental in bringing the ExamSoft pilot to Penn Dental Medicine, said there are clear advantages so far.

ONLINE TESTING OFFERS MANY OPPORTUNITIES

In addition to including images and providing important analytic feedback to faculty about the performance of both students and tests, Dr. Hangorsky says the testing more closely mirrors the national licensing exams students will have to take. "Most licensing exams today are administered online, and we want our students to be prepared," he notes. "This is the wave of the future."

Faculty and students alike seem to be pleased with the online testing, Dr. Hangorsky says. And while there are some issues that need to be addressed, he says online testing "opens a plethora of opportunities a written test does not."

Dr. Kenneth Kent, Clinical Associate Professor of Restorative Dentistry and Director of Removable Prosthodontics, was an early proponent of online testing, piloting it last spring in the course Introduction to Clinical Dentistry and Removable Partial Dentures, and this fall in his Complete Dentures. "ExamSoft offers tremendous potential for comprehensive, meaningful evaluation of our students," Dr. Kent says.

The analytics available from ExamSoft offer important feedback about how well students — individually and as a class — are learning certain topics. Test questions can be immediately validated and help discriminate between those who

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CHIA-WEI WU

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know the material and those who don't. Questions that are not working well can be quickly dropped from the test. "Data is available instantaneously," Dr. Kent says.

While the pilots for ExamSoft and the iPad Digital Impressions website continue this year, other technology solutions are being evaluated and developed — including an e-dashboard that would make it easier to track a student's progress through Penn Dental Medicine. In addition, Dr. Blatz says, "We are evaluating and slowly

implementing new online platforms and software, as part of Canvas, that allow students not only to view content, but also actively engage in online discussions, interactive polls, and virtual conferences." And beyond the undergraduate classroom, plans for offering online continuing education courses are also in development.

"These new initiatives are part of the School's broader effort to incorporate digital technologies and novel methods into our classrooms and clinics," says Dr. Blatz, "and build on steps successfully taken earlier, such as the application of electronic patient records, digital radiography and impressions, virtual simulators, and CAD/CAM technologies."

"We're building an academic technology eco-system, one that is seamless from classroom to clinic," adds Mejia. "Everything we do is driven by wanting to support 21st-century learning for dentists."

In Blatz's view, that translates into applying the best of both new technologies and established teaching methods. "In dentistry, success lies in delivering excellent direct patient care and interpersonal communication, so that will always remain a vital part of our students' education," says Blatz. "At the end of the day, I believe our curriculum will be a healthy blend of online teaching and traditional pedagogic methods." ■

—By Debbie Goldberg

RIGHT: Dr. Markus Blatz, Chair, Department of Preventive and Restorative Sciences, right, was tapped to spearhead the School's online curriculum initiatives and serve as chair of an advisory committee on the topic, working closely with Chia-Wei Wu, left, and Maria Mejia.