Hello S&T Instructors -- Welcome back to campus, to cold and to construction – as well as to what is optimistically referred to as the Spring Semester! This issue includes interviews with a couple of seasoned professors who are changing their teaching when they could be coasting, as well as two new Curators’ Teaching Professors, and information about upcoming faculty events.

Teaching & Learning With Dick and Mary

See Dick and Mary. See Dick and Mary teach. Teach, Dick and Mary, teach. After a combined 20 years of teaching in S&T’s Materials Science and Engineering Department, that’s likely what it felt like to Dick Brow, Curators’ Professor of ceramic engineering, and Mary Reidmeyer, associate teaching professor of materials science. For many years, they have taught sophomore level classes that build upon one another from fall to spring semesters – classes that they could teach with one hand tied behind their respective backs because they had “been there, done that” repeated times. Many would have said it was time for them to rest on their laurels (otherwise known as “coasting”) – and try to ignore the monotony.

Instead, Dick and Mary decided to rock the boat by experimenting with some different teaching strategies.

Risky? Sure.
Energy required? Yes, especially at the outset.

(continues on p. 2)
Uncomfortable? Undoubtedly, when these new strategies flew in the face of everything that was familiar and easy. But, they say, worth the risk and “reinvigorating” for their teaching personally.

Quasi-experiment designed
Initially, it was the duo’s frustration about their department’s senior design projects that motivated them to make some changes. By the time their students were ready to graduate, they were technically well-versed; what they lacked were the vital soft skills needed for success in their future careers.

“Effective communication is often the number one trait desired by companies,” Brow said, “You look at the surveys we get back from the employers and the problem is not, ‘Can you differentiate an equation,’ it’s, ‘Can you sell an idea?’”

Brow and Reidmeyer decided to design a quasi-experiment in their sophomore-level labs (CER 111 and 122) to see if an intervention would help their students develop better soft skills that they could then observe in their senior projects a couple years later. They wrote up a research proposal for the classroom and submitted it for a CERTI/VPAA educational research mini-grant. Their project changed the curricula of Reidmeyer’s fall lab and Brow’s consecutive spring lab so that students were doing three times as many PowerPoint presentations as they had previously, although they were shorter in duration. The crucial intervention, though, was in videotaping the students so they could watch their own presentations and self-critique. (Go here to read the full report of their project.)

Brow admits that looking at the same material year after year can become boring, which is bound to affect student learning. He found it “reinvigorating” to infuse a course with new ideas that could help student learning.

The research question for the mini-grant project was whether the lessons of effective presentations could be better learned if they were self-taught. Previous classes already included peer evaluations and comments from the instructor, yet these alone were not enough to remedy the gaps they saw in student presentation skills.

The project was piloted in fall 2012 and spring 2013. While the ultimate results will not be known for at least another year until the students from the experimental group present their senior projects and can be compared with those in the control group, Brow and Reidmeyer can point to some benefits of the project so far, both for students and themselves as instructors.

“The nice part was seeing the students’ comments,” said Reidmeyer about the self-critiques. “They made really constructive comments about their presentation -- better feedback than we can give them.”

They noted that there was a close correlation between the student critiques and the peer and instructor critiques, which were maintained from the old model. In fact, generally students were harder on themselves than anyone else was.

The project required Reidmeyer and Brow to add new technology tools to their repertoire, which they probably would not have done otherwise. They had already experimented successfully with clickers for “fast feedback” and a way to engage students more fully with the material. With this project, they were able to utilize Tegrity, a lecture-capture software, to videotape student presentations.

31 S&T Faculty Win 2012-2013 Teaching Awards

Thirty-one Missouri S&T faculty were honored in November as recipients of the Outstanding Teaching Award for 2012-2013. Each year, faculty members are selected for this award by the Outstanding Teaching Award Committee, which bases its selections on student evaluations.

Those receiving the awards were: Diana Ahmad, associate professor of history and political science; Kwame Awuah-Offei, associate professor of mining and nuclear engineering; Bonnie Bachman, professor of economics; Jason Baird, associate professor of mining and nuclear engineering; Olivia Burgess, assistant teaching professor of English and technical communication; Gerald Cohen, professor of arts, languages and philosophy; Petra DeWitt, assistant teaching professor of history and political science; William Fahrenholtz, Curators’ Professor of materials science and engineering; Darin Finke, assistant teaching professor of arts, languages and philosophy; Ralph Flori Jr., associate professor of geological sciences and engineering; Stephen Gao, professor of geological sciences and engineering; Gregory Hilmas, Curators’ Professor of materials science and engineering; Irina Iviyeva, associate professor of arts, languages and philosophy; Ronald Kohser, professor emeritus of materials science
“We found something that worked and now we can find other uses for it,” Brow says. The two plan to continue the videotaped presentations as part of these courses, and hope to inspire other faculty to consider a similar strategy.

Connections that lead to learning
With a little momentum behind them, the team decided to apply for funding for another research project for the 2013-2014 cycle of funding. They were awarded a grant to help “flip” their sequential lecture/lab course (CER 102 and 103) by putting some of the content online and freeing up time in the classroom for more hands-on activities.

This idea came about when Brow noted that students who had taken the lecture without the lab in previous semesters seemed disconnected and unengaged with the course. By adding more hands-on activities, especially for students not taking the lab, they hope to make those connections so more learning can occur. One of the chief issues they would like to address is students retaining more information from one semester to another, especially for the courses that directly build upon one another.

Another positive gain from the project is that seniors from Brow’s Ceramics 369 class will serve as “guest presenters” in the sophomore course this spring. Part of their senior coursework last fall was to develop hands-on activities that could be used to teach foundational concept covered in CER 103. Brow will ask those who developed the best activities to teach it to their younger counterparts, benefiting both groups.

Change agents
While teaching may be difficult in and of itself, Brown and Reidmeyer might propose that the harder thing would be to become a change agent in the classroom, especially when it is optional. The energy barrier to break to go from “easy to better,” as Brow puts it, can be daunting. “But once you do it a few times, you hone it, and then it becomes easy.”

Maybe not child’s play, but do-able.
See Dick and Mary run with it.

Next Cycle of Educational Research Mini-Grants to Be Available in Spring

The Vice Provost for Academic Affairs and CERTI will again be sponsoring a cycle of educational research mini-grants for 2014-2015. Look for the request for proposals in mid-February 2014.

Go here for more information on the mini-grant program.
Got an idea for designing a classroom educational research project? Sign up for “Tips for Writing a Successful Educational Research Mini-Grant Proposal,” to be held at noon Friday, March 7. See below for more information.

Spring 2014 Calendar of Faculty Events

The Spring 2014 Calendar of Faculty Development Events is now available online.
Faculty Development Events

CERTI will be hosting or co-sponsoring several faculty professional development events for spring 2014:

- **“A Non-Tenure Track Faculty Get-Together”**
  Noon-1 p.m., Friday, Feb. 7, Meramec/Gasconade Room

  What unique issues do non-tenure track faculty members face at Missouri S&T? You are invited to join Teaching Professor Scott Miller, materials science and engineering; and Associate Teaching Professor Jeff Thomas, civil, architectural and environmental engineering, for a time of networking, sharing and Q&A. Dessert and drinks provided. All non-tenure track faculty welcome. RSVP to hagnid@mst.edu.

- **“Making Homework More Effective,” part 2**
  Noon-1:30 p.m., Friday, Feb. 28, Meramec/Gasconade Room

  Hear from Bonnie Bachman, professor of economics; Dan Reardon, assistant professor of English and technical communication, and Don Wunsch, professor, electrical and computer engineering, about homework ideas that can be used in a variety of disciplines to develop collaborative learning and higher order thinking skills. Dessert and drinks provided. RSVP to hagnid@mst.edu.

- **“Tips on Preparing a Successful Educational Research Proposal”**
  Noon-1:30 p.m., Friday, March 7, Meramec Room

  Bring your ideas for something you’d like to try in the classroom and find out how to turn it into an educational research proposal for the next cycle of mini-grant funding. Fiona Nah, professor of business and information technology, and Nancy Stone, chair and professor of psychological sciences, will share information and answer questions. RSVP to hagnid@mst.edu.

- **“Flipping Out”**
  Noon-1:30 p.m., Friday, April 4, Meramec/Gasconade Room

  Find out how S&T instructors are flipping their instructional models and doing more hands-on activities with students in the classroom by putting some content online. Dessert and drinks provided. RSVP to hagnid@mst.edu.

- **TLT CONFERENCE**
  March 13-14, Butler-Carlton Hall

  CERTI will again be a sponsor of the Teaching and Learning Technology Conference on campus, organized and hosted by Educational Technology. The keynote speaker is Dr. Rebecca Brent, president of Educational Designs Inc. To register for this free event or for more information, go here.

---

**Four S&T Faculty Named Excellence Award-Winners**

Four faculty members at Missouri S&T will receive Faculty Excellence Awards at a ceremony scheduled for Tuesday, Feb. 18, 2014. The awards are given in recognition of excellence in teaching, research and service.

Each winner will receive a $3,000 stipend funded by industry and alumni contributions.

The winners are:

- **Michael Bruening**, associate professor of history and political science;
- **Siriam Chellappan**, assistant professor of computer science;
- **Xiaoping Du**, associate professor of mechanical and aerospace engineering;
- **Matthew J. O’Keefe**, professor of materials science and engineering.

Congratulations!

---

**LEAD @ S&T SHOWCASE**

S&T will showcase best practices in interactive and collaborative learning Feb. 11-12 at the LEAD @ S&T Showcase, sponsored by UM System.

Participants will come from across the state to discuss and observe S&T’s Learning Enhancement Across Disciplines (LEAD) sessions, collaborative recitations and peer-led learning groups.

This is a free event. Contact Chris Weisbrook for more information.
Lives that attest to
The Power of a Seed

Small seeds that were planted early in the lives of Missouri S&T’s two new Curators’ Teaching Professors have grown up to produce an impressive harvest.

For V.A. Samaranayake, it was his mother, a high school math teacher in his native Sri Lanka, who instilled in him an appreciation of mathematics at a young age. “She taught me tricks that people really don’t know,” said the Curators’ Teaching Professor of Mathematics and Statistics. “The elegance of those methods stuck with me.”

For David Riggins, Curators’ Teaching Professor of Aerospace Engineering, it was as a boy growing up next to Langley Air Force Base, watching the various airplanes fly overhead, that piqued his interest. NASA Langley Research Center in Hampton, Va., also nearby, was where he ultimately ended up working after earning a Ph.D. in aerospace engineering from Virginia Tech in 1988. He has continued his connection with NASA and with the Department of Defense over the years, spending most of his summers in the last decade working with the Air Force on special projects.

Interestingly, both faculty members admit to considering different career paths at one time – Riggins had an interest in journalism and creative writing, while Samaranayake considered theoretical physics or computer science – before they settled on their original passions.

Hundreds, if not thousands, of Missouri S&T students who have benefited from their instruction and training are glad they made that choice.

Both long-time instructors were awarded the Curators’ Teaching Professorship during the December 2013 commencement ceremonies. Here are some of their thoughts on teaching topics:

On being a “natural” –

Riggins and Samaranayake both claim that they aren’t necessarily “naturals” at teaching. Instead they point to a desire to communicate their passion for their subject to others. “I like seeing students who are coming in with some sort of

Quotes & Awards

“You can be a sinner; you can make all kinds of mistakes, but if you work hard at it and improve yourself, we can bring you into the fold.” – V.A. Samaranayake

University Teaching Awards:
- Outstanding Teacher Award, 2009-2013
- Faculty Service Award, 2012
- Letter of Commendation for Exceptional Teaching, 1998; 2004
- College of Arts & Science Excellence in Teaching Award, 2002
- Outstanding Student Advisor Award, 1998

“You have to like people. I like almost everyone who comes through my door.” – David Riggins

University Teaching Awards:
- Sigma Gamma Tau Outstanding Teacher Award, 1991-92
- Outstanding Teacher Award in Aerospace Engineering from Sigma Gamma Tau, 2002
- UMR Outstanding Teacher Award, 2002-03
- Dean of Engineering Teaching Excellence Award, 2004
- Outstanding Teacher Award, 2006-2011
- Faculty Teaching Award, 2011

p. 5 (cont. on p. 6)
passion,” says Riggins, who has been teaching at S&T for 23 years. “I like to see them respond and enjoy the material. I don’t know whether you call that being a ‘natural,’ but it helps me not to be ill at ease when teaching.”

Riggins’ passion specifically is high-speed flight. “Aerospace is near and dear to my heart, and aerospace propulsion in particular is my area.” He was part of NASA’s Hyper-X program when the X-43, an unmanned experimental hypersonic aircraft, set several airspeed records for jet-propelled aircraft in 2004. He takes this record-breaking type of aeronautic technology into the classroom to explain to students how physics and other engineering topics relate to real life.

“I want to bring people to appreciate and enjoy a subject that they normally would find boring,” Samaranayake says of his statistics courses. Unlike what he coins the “high priest” model of teaching – the instructor who insists on absolute precision and will not tolerate mistakes – Samaranayake sees himself more as the “missionary” type of teacher: “You can be a sinner; you can make all kinds of mistakes,” he says, “but if you work hard at it and improve yourself, we can bring you into the fold.”

Although sometimes he has been frustrated in his quest (“not everyone will be converted,” he admits), he has seen more successes than failures in his 30 years of teaching at Missouri S&T. He remembers one student who had no statistical training and begged to take his class. Although his inclination was to refuse her, he allowed the student to enroll, then offered resources that she would need to master the basics. She worked hard and became one of his best students that semester. “That taught me something,” he said.

On connecting with students --

How do you get students to appreciate statistics? Samaranayake has found that if he can show students how relevant his content is to their long-term goals, he can get them engaged. He includes real-life examples in his class presentations where the use of statistics makes a big difference. Class projects mix engineering experiments with statistical analysis. Samaranayake also shows his classes websites that advertise short courses for industry professionals costing upwards of $5,000 for one week of training. He then points out how all of the topics from the short course are included on his syllabus.

“It is useful information,” he tells students. “That’s why companies pay this much. This is what we will cover at a much slower pace and at a much lower cost to you.”

In addition, he also tries to help his students see the benefit of having a broader background that what they think they need. “What sets you apart in the engineering world?” he asks them. “When everyone is an engineer, someone with a good knowledge of statistical applications or good communication skills is going to stand out from the rest.”

Riggins makes it a priority to be available to students, but is quick to add that a successful faculty member is master of his or her own time. “You have to prioritize. You can’t let your classes consume all of your time; you can’t let your research consume all of your time. You have to be able to change gears.” For example, he might be talking to students about why they are interested in aerospace engineering one minute, and then answer a phone call from NASA the next.

Resources

Shared About Disabilities, Testing Center

What is a faculty member’s responsibility toward students with disabilities? What changes are coming to the Testing Center? How do medications affect student learning?

The 2013 Curators’ Teaching Summit discussed these and other questions in its annual fall event.

The following resources are available from the Summit:

- A video recording of the Nov. 11, 2013, session featuring Connie Arthur, of the Disability Support office; Cheryl Downey-Eber, of the Testing Center, and Ross Gubrud, of the Counseling, Disability Support and Student Wellness office.
- A Q&A from the session listed above on topics of student disabilities, medications, and usage of the Testing Center.

Another resource available on these topics is a webinar entitled, “How to Handle Disruptive & Dangerous Behavior: 10 Innovative Approaches to Addressing Mental Health Issues on Campus,” offered by Innovative Educators. The video archive will be available through October 2014 for the campus’ use.
A positive attitude and enthusiasm are also critical, he says. “You have to like people. I like almost everyone who comes through my door.

“The way to have enthusiasm is to have fun at your job as much as you can,” he adds, “despite the time constraints, which are considerable.”

**On the nature of today’s students –**

Both Riggins and Samaranayake say that their classes generally are as full of bright minds as in years past, but note some disturbing differences from previous generations.

Riggins has seen a change in motivation levels, especially when it comes to students being able to persist through difficulties. “In some ways, it seems more difficult for the average student to see things through,” he notes. “They tend to have shorter attention spans.”

To help compensate, Riggins has adjusted his teaching slightly – incorporated more examples while still covering theory and analytics – however, he has retained the traditional lecture format for the most part. “The reason I haven’t changed too much is because it works,” he says. “I measure that by feedback of students who have been out in the business and industry.”

Samaranayake, too, has witnessed some changes from years past.

“They come here with less preparation on the fundamental concepts,” Samaranayake says. “They also come with less of an understanding of how hard they have to work to get to the point (of being successful). That has changed from previous years.”

To assist students, Samaranayake has added prerequisite material on Blackboard and offers evening sessions for students who don’t have the necessary background for his courses. For his distance sections, he videotapes material, including sessions on prerequisites, and puts it on the Web – resources his local students also appreciate.

**On being named a Curators’ Teaching Professor –**

Both professors are looking forward to the increased platform they will have to serve their colleagues and departments.

“Of course it’s a real honor,” Riggins says of the professorship. “It is an opportunity to try to encourage the new faculty to improve their teaching. Teaching is kind of hard. Some people really struggle at it and some get really good at it. I hope to be able to be there as a mentor.”

Samaranayake, who has developed or co-developed a number of courses for his department as well as added distance sections to existing courses, would like to serve as “cheerleader” to help his colleagues continue to develop new courses in emerging areas in mathematics/statistics and revamp existing courses. One of his goals is to see offered a complete distance option for applied statistics.

He also wants to continue mentoring graduate students and get them to a level of being effective teachers, as well as looking forward to mentoring new faculty.

Both plan to continue their research as well, Riggins in propulsion and high-speed flight, and Samaranayake in time-series analysis, reliability analysis, and statistical methods and models as well as applications for engineering.

**Teaching awards and activities**

Riggins has received campus teaching awards dating back to 1991 through 2011 from a variety of sources, such as Sigma Gamma Tau, Committee for Excellence in faculty teaching awards. He also teaches in a number of forums for professionals in the aerospace engineering field, for which he has received several awards.

Samaranayake has received advising, service and teaching awards beginning in 1998 through the present, including the College of Arts and Science Excellence in Teaching Award in 2002, and six campus outstanding teacher awards.

He also has worked with K-12 teachers in summer institutes since 1996. He and Allan Pringle, also a Curators’ Teaching Professor, together with David Westenberg, associate professor of biological sciences, and Jana Neiss, director of the S&T teacher education program, continue to hold summer workshops for K-12 math and science teachers, in an Improving Teacher Quality Grant program funded by the Missouri Department of Higher Education.