



FEATURES

- 12 **THE "TPACK" FRAMEWORK**
Mishra and Koehler influence definition of technology in teaching
- 16 **PILLARS OF PROMISE**
Williams, Crespo and McCrory pave new research paths with CAREER awards
- 28 **ON POLICY**
Shakrani talks about trouble with teacher retention across the nation
- 32 **SCIENCE FOR CITY KIDS**
Calabrese Barton explores unconventional strategies with "GET City"
- 42 **TRAVELING TO TANZANIA**
Doctoral student earns Fulbright-Hays fellowship for research
- 48 **"CAMPING" IN CYBERSPACE**
College alumna creates virtual summer learning experience



SECTIONS

- 4 **UPFRONT**
- 36 **FACULTY**
- 40 **STUDENTS**
- 48 **ALUMNI**
- 54 **DEVELOPMENT**







a wider window

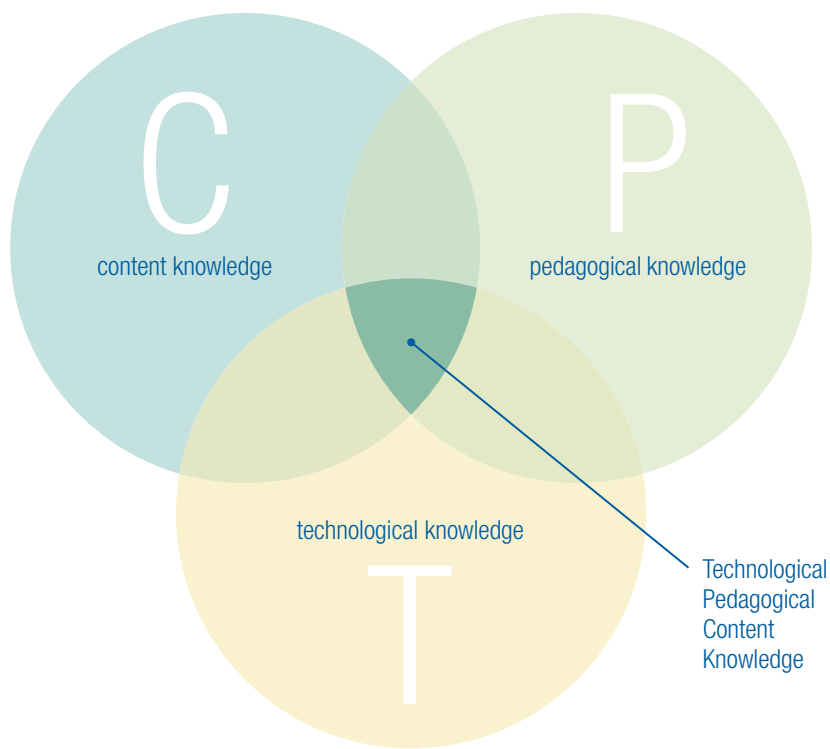
mixing technology
with teaching's
truest missions >> nicole geary

FROM TWO INNOVATIVE thinkers tucked in adjacent MSU offices and years of their collaborative experiments at the College of Education came T.P.C.K.

They are four little letters representing the fundamental components in education—*technology, pedagogy, content*—that, when inextricably linked, can create the kinds of *knowledge* teachers truly need to successfully integrate technology in their work.

At least that's how hundreds of scholars have now accepted and explored TPACK as the concept continues to round a loop of nationwide conferences.

And Technological Pedagogical Content Knowledge, a complex theoretical framework conceived by associate professors Punya Mishra and Matt Koehler, is quickly gaining a foothold for promising change within the broader teacher education community, colleagues say. ▶



“(TPCK) is likely to have a significant impact on the profession and lead to more effective uses of technology . . . by viewing (educational technology) through a different lens,” said Glen Bull, co-director of the University of Virginia’s Curry Center for Technology and Teacher Education. “The reason that it’s had such good reception is because it resonates with people’s intuition about what needs to be done. They articulated something that didn’t yet have a name.”

Solving a “wicked” problem

Mishra and Koehler, both faculty members in the Department of Counseling, Educational Psychology and Special Education, found they were equally discontented with the direction technology in teaching was taking when they met seven or eight years ago.

The call for teachers in K–12 and

higher education to incorporate the Internet, PowerPoint and other digital technologies kept up its constant drumbeat, but the question of what educators really need to know to make instruction with technology meaningful, and how they learn those skills, was a still-emerging debate.

To Koehler and Mishra, it was a “wicked” problem they were passionate about solving.

It’s wicked because, simply, there is no easy answer. Instead, effective use of technology for teaching and learning involves “incomplete, contradictory and changing requirements bound by complex interdependencies.”

Technology can be a powerful window for student learning, whether by bringing Web-based professional development to practicing teachers or asking kids to capture images of nature for science lessons with digital cameras.

Choosing which technology to use, however, must not be directed by the latest advance or recommenda-

tion but rather through an informed hands-on decision by the practicing teachers themselves, Mishra and Koehler argue. More importantly, the decisions must be framed specifically based on what they are teaching (the content) and what method they plan to use (pedagogy).

Building on college resources, Shulman’s ideas

The pair found a rich environment for testing their ideas in the College of Education, where leaders have increasingly emphasized the need for faculty development in the area of technology use. With strong support from Dean Carole Ames, their research was incorporated into courses during which tenure stream faculty and educational technology master’s degree students were charged with designing every component of an online course, Web site or presentation—all in a highly contextualized manner.

The “learning technology by design” approach was working, they determined, with a pile of artifacts, survey data and journal articles to prove it.

That was when, in the midst of two supporting grants and a major book co-edited with MSU Professor Yong Zhao, Koehler and Mishra compiled their evolving findings into a larger theoretical framework.

Technological Pedagogical Content Knowledge, which has morphed into the easily pronounced acronym TPACK (“tee-pack”), adds a modern and logical twist to a concept presented by a giant in the education fields 20 years ago.

Lee Shulman’s thinking of Pedagogical Content Knowledge, that knowledge of teaching methods must be applied to the teaching of specific content, has made a dramatic influence on education. Now president of The Carnegie Foundation for the Advancement of Teaching, he was a professor of educational psychology at MSU’s College of Education from 1963 to 1982.

Building on that model, Mishra and Koehler argue technology is now an equally important ingredient that shouldn’t be kept in isolation. Rather, TPACK—nicknamed the ToothPiCK model by one affectionate fellow faculty member—emphasizes the new kinds of knowledge that lie at the intersections.

Teachers who understand and negotiate the relationships between content, pedagogy and technology then gain a different form of expertise that’s greater than a disciplinary expert (say, a historian), a technological expert (computer scientist) and an experienced educator.

They begin thinking of technology not as a transmission device but as a catalyst to enhance learning that wouldn’t be otherwise possible.

“It has become this snowball”

TPACK is not necessarily an entirely new idea, but the term has been increasingly used by those in the educational technology field since Mishra and Koehler published their definitive description in the June 2006 edition of *Teachers College Record*.

“In some ways, it’s a beginning. There was no framework before; people were just trying different things,” Koehler said.

“It has become this snowball which has sort of picked up heavily at the national level,” said Mishra.

Among their most notable experiences was a forum during the February 2007 annual meeting of AACTE, or the Association of Colleges of Teacher Education. Interested in the framework’s potential for more widespread implementation, AACTE had commissioned a collection of papers to explore TPACK’s “parameters within and between multiple curriculum areas, varying teaching and learning contexts, and in use with both preservice and inservice teachers.”

The *Handbook of Technological Pedagogical Content Knowledge for Educators*, pre-released as a monograph, is now available for purchase with a first chapter written by Koehler and Mishra.

“We’re seeing lots of people starting to align their research to (TPACK),” said Bull, who also has a chapter. “Things like the AACTE handbook will go a long way toward bringing it to the foreground.”

Meanwhile, the October 2007 National Technology Leadership Summit, which brings together leaders from 10 major teacher educator content associations, focused on the concept as a major study topic. The Koehler-Mishra model, as it’s sometimes called, also will have a heavy presence at the upcoming SITE, or Society for Information Technology & Teacher Educa-

tion, conference in March, where the pair has been invited to present a keynote address on TPACK and creativity. This conference also will include more than 20 presentations by other scholars from across the United States, based on the TPACK framework.

They have jokingly been called the “toothpick guys” but it appears TPACK is establishing a foundation for the educational technology field that’s far from fragile.



View the TPACK wiki for more information at tpack.org

