

By Karen Work Richardson

In 2006, Punya Mishra and Matthew Koehler, then graduate students at Michigan State University, advanced thinking about educational technology with a new model of teacher knowledge when they introduced the technological, pedagogical, and content knowledge (TPACK) framework. TPACK makes the link between technology, content, and pedagogy explicit.

Using TPACK as the foundation for professional development involves asking teachers to consider the ways technologies can support numerous pedagogies and content areas. One way to do this is by playing the TPACK game invented and developed at the National Technology Leadership Summit's annual gathering in 2007.

I have used the game with groups of educators ranging from school principals and technology coaches to preservice and inservice teachers. The goal is to further teachers' thinking about the intersection of technology, pedagogy, and content. The results are sometimes surprising new ideas about integrating technology into the classroom.

Prepare the Game

To play the game, you'll need three containers, such as paper bags, hats, or baskets, and slips of paper or cards. In the first container, place slips of paper listing different content areas, such as language arts, social studies, art, and physical education. In the second container, place slips of paper listing technologies, such as blogs, spreadsheets, simulations, drawing tools, digital projectors, and document cameras. Finally, in the third container, place slips of paper listing instructional strategies such as lectures, collaborative learning, drill and practice, and project-based learning.

Although the original game suggested generating 12 examples each of content, technology, and pedagogy, you can include as many as you like. In addition, all three can be customized based on your own school or the group with which you are working. You might list the specific courses taught by the game players. For example, you could name specific math classes, such as calculus or algebra. If you are working with groups of teachers who all teach the same content, you might have them dig a little deeper into that content by including particular strands within their subject.

You could also include specific hardware and software that your school or district has adopted to encourage game players to think about the specific tools they have access to.

Many schools have adopted particular pedagogical approaches, such as those espoused by Robert Marzano, which include identifying similarities and differences; nonlinguistic representations; cooperative learning; reinforcing effort and providing recognition; summarizing and note taking; generating and testing hypotheses; cues, questions, and advance organizers; homework and practice; and setting objectives and providing feedback.

Play the Game

Once you've prepared the slips and placed them in the containers, the game begins. Players draw slips of paper from two of the three bags and then fill in the third item in a way that would make an effective learning experience for students. For example, they might select a content area and a technology, and then consider what pedagogies might make sense to create a classroom activity. Or they could select a technology and pedagogy, and then consider which content area might benefit from that combination.

Finally, players pull strips from all three bags and brainstorm a lesson that would incorporate this combination of technology, pedagogy, and content. There are certainly combinations that will not yield useful ideas, but the inability to find an appropriate lesson will help the players understand the TPACK framework.

As they work, participants should record their successful ideas, which should be placed in a shared space so they can learn from each other. I usually put them on a wiki page so participants can revisit them when they are looking for new ideas and add new ones as they develop them.

Follow-up discussions about the various combinations help participants refine their own ideas. Each time I have played the TPACK game, the groups have generated new and creative ideas for combining content, technology, and pedagogy. Here are some of the ideas that have come out of these brainstorming sessions:

- In a science classroom, as a way of supporting nonlinguistic representations, teachers and students use digital cameras to take pictures of the lab setup, and then students make audio recordings of their process as they work.
- In a history classroom, students use graphic-organizer software to brainstorm objectives for what they want to accomplish as part of a unit.

- In an English classroom, students use a wiki to take notes, collaborate with each other to determine essential information, and practice summarizing and peer editing.
- In a math classroom, the teacher uses a student response system to administer a pre-assessment to provide feedback to both the teachers and the students about their understanding of core concepts.

Reflect on Practice

Participants have indicated that the game reminds them of the variety of pedagogies and technologies available for the classroom. The game encourages them to reflect on their practice and find fresh approaches to teaching different types of content in new ways.

And, according to the feedback I've received, many are doing just that. The technology coaches report that they are using the game as part of their professional development, and it has made them more aware of the importance of content area and teachers' instructional strategies for determining how to best integrate technology.

I have also heard from teachers in different grade levels and content areas about the influence the game has had on their practice. Here are a few examples:

An elementary school science teacher is having her students keep science journals on a blog instead of in a paper notebook. Students summarize information and hypothesize about labs, and, unlike the paper-and-pencil version, the blog provides a launching pad for additional discussion. She has noticed that the blog has given less-verbal students a platform for participation.

A middle school math teacher is using Inspiration to help her students work through the process of solving two-step equations. Visualizing the process has helped make it more concrete, and they seem better able to apply it as they work on problems.

A high school English teacher has used the student response system to foster a discussion about Hamlet.

A middle school social studies teacher had his students manipulate a Venn diagram on the interactive whiteboard to review similarities and differences between the North and South in the years leading up to the Civil War.

These educators are developing new ideas for using technology in powerful ways to support learning and teaching in their classrooms.

Find out more about the summit and TPACK in general at the TPACK wiki (http://tpck.org/tpck/index.php?title=NTLS_meeting%2C_October_2007).

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