

Thoughtfully Incorporating Technology into your Instruction with the help of TPACK

Benjamin Oberdick, Michigan State University

It all began with a class. I was in the Master of Arts in Education program at Michigan State University (MSU), and I was reading an assigned article on something called Technological Pedagogical Content Knowledge (TPACK). According to Koehler, one of its co-creators, TPACK “attempts to identify the nature of knowledge required by teachers for technology integration in their teaching, while addressing the complex, multifaceted and situated nature of teacher knowledge” (2012, TPACK Explained section, para. 1). As I continued to read the article, and learn more about TPACK, a light bulb moment happened: I realized that this framework gave teachers a structure for thinking about how to incorporate technology into a lesson plan in a holistic manner, and treated technology on equal terms with the class content and the pedagogy being employed, rather than treating technology as something to just add-on to a lesson plan that has already determined. In my time as an elementary school teacher, and also as an instruction librarian, I had seen many instances where technology was treated as an afterthought to a lesson, both by others and by myself. I enjoy technology and trying new things in the classroom, and I often wanted to try out a new technology or add in some new “cool” tool, but it often was used for a lesson that was already planned, instead of being part of the development process. Upon reflection, this approach did a disservice to my students and I was excited to find a framework that treated technology as an equal partner with the class content and the pedagogy being used, to help create an effective, engaging and appropriate lesson. I began my quest to learn more about TPACK and to see how I could incorporate it into my teaching.

Background on TPACK Framework

The TPACK framework, created in 2006 by two Education faculty at Michigan State University, Matthew Koehler and Punya Mishla, extended the work of Lee Shulman, who in 1986 claimed that “the emphases on teachers' subject knowledge and pedagogy were being treated as mutually exclusive” (Shulman, p, 19). TPACK recognizes that effective teaching requires teachers to not only be experts in the subject and content they are teaching, and be knowledgeable of the different pedagogies available to teach the material, but must also be adept at matching the appropriate technology to the teaching situation. This includes being aware when a teaching situation does not warrant **any** technology being used, which is an equally important skill since sometimes technology

can get in the way of the most appropriate and effective way to teach a particular lesson.

The TPACK framework focuses on three different forms of teacher knowledge—Content, Pedagogy and Technology—and where they intersect, in order to provide for a holistic approach to education where teachers effectively integrate these forms.

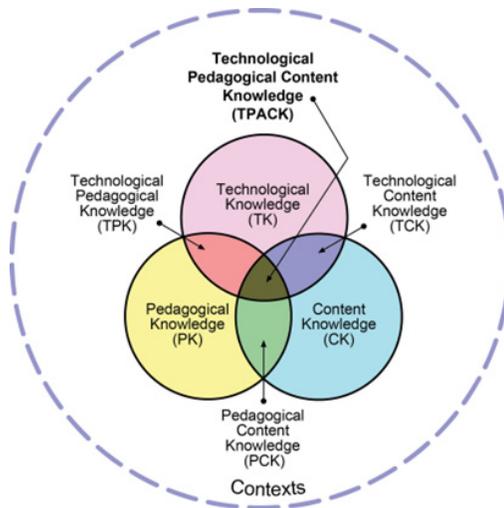
The TPACK.org website, maintained by Matthew Koehler, explains the seven components of TPACK (see Figure 1); the following is a summary of his explanation. (Koehler, The Seven Components of TPACK section):

- *Content Knowledge (CK)*: knowledge of the subject matter to be learned or taught.
- *Pedagogical Knowledge (PK)*: knowledge and understanding of how students learn, general classroom management skills, teaching approaches, lesson planning, and student assessment.
- *Technology Knowledge (TK)*: knowledge about technology, both new and old, particularly understanding information technology and recognizing when it can assist or impede the achievement of a goal.
- *Pedagogical Content Knowledge (PCK)*: understanding how to make content comprehensible to students, recognizing where students stumble in learning particular content, and identifying common misconceptions or hurdles in learning a particular subject.
- *Technological Content Knowledge (TPK)*: understanding how technology can be used to enhance the teaching of some specific content.
- *Technological Pedagogical Knowledge (TPK)*: understanding how technology can affect different teaching approaches.
- *Technological Pedagogical Content Knowledge (TPCK)*: understanding the intricacy and interplay of technology, pedagogy and content on teaching and learning.

Other Benefits of TPACK

Beyond helping ensure the proper integration of technology into instruction planning, there are other benefits to using TPACK. Most librarians, just like most teaching faculty, were not trained as teachers. For those librarians who are new to teaching, and even for many experienced teachers, teaching is an ill-structured and complex activity. And while having a background in education and teaching can make this “easier” in some ways (I went in

Figure 1:
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knowing a lot about pedagogy and how to write a learning outcome since I was a K-12 classroom teacher before becoming a librarian), teaching will always be a highly complex and dynamic activity, with a high level of variability, with no one right answer or solution, and adding technology into the mix just adds another degree to the complication; this makes a framework like TPACK even more necessary.

Using TPACK can also help librarians when working with their liaison faculty. Engaging in collaborative inquiry with teaching faculty can allow for new opportunities to combine what a librarian knows with what a faculty member knows and create deeper understandings and new collective knowledge. A teaching faculty member enters into this partnership with a specific content focus, bringing a set of pedagogical and technological skills to the table and the librarian possesses specific skills and knowledge as well, and provides support for the teaching faculty member's knowledge of our areas. Jayme Linton (2012), came up with a list of questions centered on the TPACK framework that can help guide this collaborative inquiry process (p.28):

- What content do students need to learn?
- What are students expected to know or be able to do related to the content?
- What resources can help students access, organize, and understand the content?
- What are common misconceptions and breakdowns in student learning of the content?
- What research-based instructional practices will best facilitate student learning of the content?
- What formative and summative assessment practices will allow the teacher to evaluate student learning and adjust instruction based on student progress?
- What adaptations of content, instruction, and assessment are needed based on student needs?

Example of an Activity

Ok, so how can you use this when you are designing and planning activities and lessons for your classes and students? Here is one activity that I have found helpful in “testing-out” TPACK. Start with a pack of sticky notes (or strips of paper, note cards, or whatever works for you). Take ten sticky notes and on each one write down an Information Literacy related topic that you might cover in class—for example, popular vs. scholarly sources, what is a primary source, how to evaluate a source, etc. Then, take ten more sheets and on each one write down a pedagogical approach that you might employ in class on each—for example, cooperative learning, collaborative learning, problem based learning, lecture, etc. Then, take ten more notes and on each write down a type of technology that you might use in class—for example, white board, clickers, tablets, phones, Poll Everywhere, Smart Board, projection screen. Remember to think broadly about technology (i.e., not just digital technologies, but analog technologies as well, such as flip charts or a chalk board) and cast a wide net. Then, pick out one note from each pile and try to create a lesson using that type of pedagogy and technology to teach that IL topic. Ask yourself:

- How does the technology support the content and the pedagogy?
- Is there another technology/application that fits the content and/or the pedagogy in a better way?
- If so, Which one? Why? How?

After learning about TPACK, and playing around with the sticky note activity for a bit, I decided to try to apply it to the information literacy sessions I frequently teach for First Year Writing class students. I picked an activity—for which I typically use clickers—where I talk about the differences between popular, scholarly, and trade sources. It was an activity that I found to be generally successful in the past, but I had decided to use clickers as an add-on without really thinking about it in a holistic way. I thought I could plan a better activity to get at this content if I approached it fresh and incorporated TPACK into the planning. So I went back to square one and rethought what content I wanted students to get out of the activity—to be able to identify and list characteristics of different sources in order to differentiate between popular and scholarly sources. After the content was set, I thought about what approach I wanted to use to teach the lesson, and what technology would be the best way for me to get there. I definitely wanted to take an active, discussion-based approach, where students would work closely together to create a list of characteristics for each

(TPACK...Continued from page 5)

of the three types of periodicals I was giving them. Also, many of the classes I teach take place in one of our classrooms that are well-suited for cooperative learning activities and I thought that I should capitalize on these advantages for the lesson.

So, after thinking through some activity ideas, and the technological choices that would fit well with the content and active approach, I decided to divide the classes into roughly equal-sized groups, and give each group a stack of sources comprised of these three different types of periodicals. After some directions and prompting, each group would work together to identify whether each source was a scholarly journal, trade journal or magazine, and also work together to figure out some characteristics of each type. Then, we would talk as a whole class about the characteristics they came up with and make a list of the three source types on the big classroom whiteboard. After trying this a few times, and tweaking things a bit, I have found this to be a better activity than my prior one because it allows students to work together to create a list of characteristics of these different periodicals which relates directly to my learning outcome for the activity. This is not to say that clickers are bad or not useful. I still use clickers in my instruction, and have found them to be extremely useful and beneficial, but for this lesson clickers would not allow me to have students create their own list of periodical characteristics, or allow for the same level of student discussion in the groups. I have continued to use this method of lesson planning and have incorporated it frequently into subsequent activities and lessons that I have designed.

Conclusion

In the end, TPACK has helped me become more purposeful in my teaching—I think about the whole lesson, not just one part of it, and have become less likely to add something to my lesson without weighing what I am truly trying to accomplish. At the same time, it has not reduced my desire or ability to try new things, because TPACK is agnostic on whether technology should be used or not—if a tool will improve my lessons (or at least potentially improve it), it allows me to make thoughtful decisions. I make sure the technology serves my teaching and my students, instead of the other way around.

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