

Give Your Lessons a Tech Makeover



Use the TPACK learning-by-design method to turn a good lesson into a great one by incorporating technology that enhances—but doesn't overshadow—the learning objectives. Then tweak it until you get it just right.

The state of technology integration in K–12 schools today is something of a paradox: Access to tools and resources is continually expanding, and most teachers report interest in educational technology, yet widespread and pervasive use of technologies in classrooms remains elusive. And while it's easy to find examples of innovative and creative uses of classroom technology, systemic change has been slow to materialize. There are many possible reasons for this, including limited access to tech tools, the pressure of high-stakes testing, and the compartmentalized structure of middle and high schools that limits interdisciplinary projects. But perhaps the most fundamental and persistent obstacle to effective tech integration is the complexity of knowledge it requires.

Think about the different kinds of knowledge teachers must draw on in the planning and implementation processes. It's not enough to simply find and learn how to use an interesting tool or resource. They must also determine the right fit between the tool, the curriculum, and the learning activity. This kind of integrated knowledge is called technological, pedagogical, and content knowledge, or TPACK.

Punya Mishra and Matthew Koehler, the developers of the TPACK framework, suggest that one way for teachers to build this knowledge is through "learning by design." In this approach, teachers collaboratively design a solution to an instructional challenge. Then they put the solution to the test in the classroom, reflecting on and modifying it based on their experience. It is through this process of design, reflection, and tweaking that teachers can develop their TPACK.

While this is a great way to create new lessons, for many experienced teachers, TPACK comes into play more in "re-imagining" units they have already planned. Candace Schafer-Southard, a high school history teacher, has put many of her tried-and-true lessons through the learning-by-design process to effectively integrate appropriate technologies. Read on to find out how she successfully remade one project into a technology-infused history lesson that students would not soon forget.

—Mark Hofer

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New School, New Tools

My professional teaching experience began in a living history museum. Hands-on experiences, artifact analysis, and the inquiry method were my favorite teaching techniques. When I began teaching in a high school, I had to figure out how to adapt these methods I had used in the museum to the classroom, where my access to authentic artifacts was limited. Over time, I was able to replace those artifacts through the use of multimedia technologies. But it was a slow transition because I didn't have access to much technology at first.

That all changed in 2007, when I transferred to Warhill High School in Williamsburg, Virginia. Billed as Williamsburg-James City County Public Schools' "technology school," Warhill opened with an array of technologies, including computer labs, four computer stations in every classroom, tablets, in-room projectors, wireless keyboards, a plethora of online resources, and access to many types of software. With these new tools came the expectation that teachers would modify their lesson plans and teaching methods to include the new technologies. Fortunately, our school's instructional technology resource teacher (ITRT), Patti Bowen, was there to guide and assist the teachers with this daunting challenge.

Training and Collaborative Planning

During opening week, Bowen offered mandatory training sessions to introduce the available technology and help convert traditional classroom activities into high-tech lesson plans. First she asked us to look at our lesson plans and projects to see where technology might enhance the learning objectives. Once we had made our selections, she offered more in-depth training sessions for the technology applications we selected and worked with us to

ensure the technology did not overshadow the objective of the lesson.

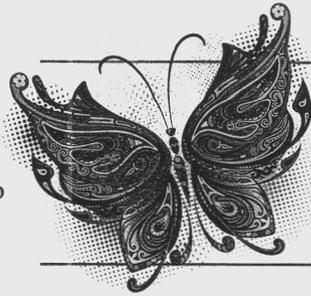
The ITRT was also available to meet with us during our planning periods to brainstorm ideas about using technology to enhance our lessons and teach us how to use the programs. This was the collaborative part of the learning-by-design method.

Old Project Meets New Tech

Eager to use the tools available to me, I looked through my old lesson plans in search of a project that would benefit from the incorporation of technology. I zeroed in on an end-of-unit project from my World History II class (1500 to the present) focusing on the monarchs of Europe during the ages of Absolutism and Enlightenment. I chose this project as my first conversion from “old school” to “techno-school” because it was successful as originally designed, but it held the promise of being even better with the addition of technology. Going into the conversion, I truly believed that the technology would enrich the students’ educational experience and improve the outcome of the project without dominating the learning objectives or the focus of the lesson.

My overarching goal for the project was to help students to not only remember monarchs from the ages of Absolutism and Enlightenment, but also have some creative fun with the information. I encouraged my students to find interesting personal stories about the monarchs that would make them more “real” and help bring them to life. My hope was that if the students could identify with the monarchs as people, they would be more likely to internalize the information and make connections.

My original approach to the project required students to create a music CD cover that highlights 10 monarchs from this era (see some examples at monarchs.wmwikis.net/CD+example). As part of the CD



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cover, students created song titles that described each of the monarchs, wrote a few sentences overviewing each monarch’s reign, created a title and illustrated cover, and wrote an introductory paragraph about the era during which the monarch reigned. It was a fun and interesting project that helped students express their creativity while learning about the accomplishments of key rulers.

I redesigned the project to include use of video and audio software to enhance the end products and expand the amount of information I asked students to include. In this new approach, the students worked in pairs to develop the CD cover as well as a short documentary on one of the monarchs. They found images and period-appropriate music online, then used either MovieMaker or Photo Story to create a 3- to 5-minute documentary focused on the featured monarch’s reign and accomplishments.

Testing It Out

The learning curve for me in this lesson transformation was tremendous! Before I could expect my students to use the technologies successfully, I needed to learn how to use them myself. The ITRT helped me get started with the software. Then I went through every step that my students would be taking while working on the redesigned project: I selected a monarch, completed research online, wrote the narrative, located the visuals and period music, and documented my sources. I used Audacity to record the narrative and download the musical selection, and then I exported the audio into MovieMaker along with the visuals to create the final documentary.

The experience I gained from completing the project as the students would was invaluable. It allowed me to write detailed directions for the class to follow, determine the pacing of the project, troubleshoot problems with implementation of the programs, and answer students’ questions based on my personal experiences. Completing my own project, though, was only the beginning. Once I finished my sample documentary, I began the preplanning for my classes, which included:

- Determining the dates
- Reserving the computers
- Identifying useful websites and bookmarking them online for ease of student access
- Reserving time with the media specialist to teach students how to use databases and print resources for their research
- Writing the project plan
- Creating handouts for the students

The Students’ Turn

On the first day of the project, I distributed detailed directions to the students that included a pacing guide (goo.gl/5sUjzO) and grading rubric (goo.gl/w3wFbM). I then showed the students the example project I had created (goo.gl/svKGCf), followed by a brief discussion of my requirements and expectations for quality.

Next, I gave a brief lesson on how to use the software programs as well as the media center resources available. Then the students selected their partners, brainstormed documentary ideas, and decided how to divide project responsibilities. We progressed through the project in the following sequence:



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The benefits to our students are well worth the effort and apprehension on our part.

Day 1: Introduction, sample project, topic selection, initial brainstorming

Day 2: Creation of CD cover, including images, song titles, and descriptions; research, including image search

Day 3: Polishing and recording of narrative, beginning of MovieMaker project, importing audio

Days 4–5: Production of films and finalization of CD cover

Day 6: Student film screening

Differentiating by Skill Level

One of the classes that completed this project was designated gifted and talented (GT), and the other was a class with heterogeneous ability levels. Both classes completed the project successfully but used different software at different levels. The GT section completed the full project using MovieMaker and Audacity, while the heterogeneous section used PhotoStory.

Since the GT section progressed at a faster pace and had a few extra days to devote to the project, they were able to complete the project in a more complex way, using software that provided more advanced features. The heterogeneous class needed the shortened version of the project and the more limited movie creation software to keep up with the pacing of the course. Both groups, however, were able to meet the learning objectives while developing and applying different modes of creative expression. Both were focused on their research, excited about finding quality images to represent their monarchs, and intent on creating interesting CD covers.

The main differences I noticed between the groups was the depth of

learning each achieved, the vocabulary they used in the narratives, and the lengths of their documentaries. The GT students included more information in the descriptions accompanying each song title and went well beyond my requirements to include more personal information and interesting stories about their featured monarchs in their documentaries. The students in the heterogeneous class included the required information but focused more on basic facts and omitted some stories about the monarchs that had perhaps been more difficult to uncover in their research. The GT students' narratives included vocabulary that was more academic and similar to historians' language, while the students in the heterogeneous section used intermediate-level vocabulary.

Good Results

I admit that I had reservations about incorporating unfamiliar technology into an already successful project. I was apprehensive about my ability to use the software and concerned about the project's pacing. Mostly, though, I did not want the use of technology to overshadow the learning objectives. I'm happy to say that my fears were unfounded.

Using the new programs enhanced the project and helped the students create a better overview of each monarch for the class to enjoy. Students actively sought more information and interesting facts to include in the documentary portions of their projects. As a teacher, I enjoyed seeing my students get so engaged and discovering how incorporating pedagogically appropriate technology could enhance a curriculum-based project.

Allowing the students—who, as digital natives, thrive on technology—to be creative within the parameters I gave them resulted in a memorable learning experience and some well-rounded finished projects.



I used a rubric to assess student work on the project. The best projects showed creativity and included information that showed the monarchs as real people. Each group presented their CD case and video (MovieMaker or PhotoStory) to the class. This helped students see the monarchs in a variety of ways, and it served as a review before the test.

At the end of the unit, the students completed a traditional multiple-choice and short-answer assessment. The classes that completed the movie project outperformed my previous classes that did this lesson the original way by an average of eight percentage points. That shows me that students learn at least as much from this new way of teaching the project. But most important, many have repeatedly told me that the remade project was the highlight of the course for them.

Lessons Learned

Like the majority of the faculty, I came to Warhill to take advantage of the technology. Some of my colleagues were overwhelmed with the prospect of effective tech integration and did not pursue more than we had to. Others maximized the opportunity and continued to find ways to incorporate more technology into their lessons, either by retrofitting or creating new lessons that use tools in pedagogically appropriate ways.

The learning-by-design process has been challenging for me at times too. At first I was concerned that the tools would become the lesson rather than enhance the lesson. Then I was worried that if I gave the students too much creative license, they would not produce the desired results, and the project would not end up enriching their

understanding. But I discovered that the benefits to our students are well worth the effort and apprehension on our part.

We did have some technical difficulties, but they were easily solved. For example, when students failed to save their progress in secure folders, other students unfortunately were able to tamper with them. We rectified this by reminding the students to save their work in the proper place. We also had initial problems with uncharged laptop batteries, which I addressed by bringing in power strips so students could plug in their machines before they lost any work.

I also found that being conscientious and choosing the right technology to enhance a lesson is critical to success. Allowing the students—who, as digital natives, thrive on technology—to be creative within the parameters I gave them resulted in a memorable learning experience and some well-rounded finished projects. I was surprised at how amazingly creative they are and how they were able to take their projects in directions I had not imagined while still meeting their instructional objectives.



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