

Teaching Pre-Service Teachers to Integrate Technology: Situated Learning with Online Portfolios, Classroom Websites and Facebook

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Abstract

In this article we describe the evolution of an elective course designed specifically for undergraduate students in our pre-service teacher education program. This course is intended to prepare these undergraduate students as future teachers—helping them to make effective and creative uses of technology in learning settings. This course emphasizes learning to learn *with* and *about* technology, in the ever-changing context of educational technology. Generally speaking, we outline and describe three key goals of teaching young teachers to thoughtfully integrate technology into a real-world classroom. First, the course emphasizes learning to explore and learn proactively by engaging in learning by design activities. Second, students are given an opportunity to try a wide variety of innovative technologies through explorations of their own choosing. Finally, we attempt to leverage the power of online community building for learning by harnessing the ubiquity and convenience of tools like Facebook. We look into the future with great hope and enthusiasm that our pre-service teachers will lead the way in integrating new technologies into their teaching in ways that will benefit their students, colleagues, and the greater education community.

Keywords: creativity, educational technology courses, future teachers, e-portfolios, learn-

ing by design, online communities, pre-service teachers, social media, technology integration, website design

In this article we describe the evolution of an elective course designed specifically for undergraduate students in our pre-service teacher education program. This course and this article are a bit different than the other articles in this spotlight issue (which focus on graduate courses), in that the undergraduate students involved have little or no teaching experience, and come into the course without a framework for understanding how to integrate technology into a lesson or teaching practice. While most of our graduate students possess professional experience in education, and an understanding of the issues involved in learning technology, the pre-service undergraduate students in this course are just beginning to acquire this understanding. Given this, the course we discuss in this chapter is intended to prepare these students as future teachers—helping them to make effective and creative uses of technology in learning settings. This course emphasizes learning to learn *with* and *about* technology, in the ever-changing context of educational technology.

In this paper we focus on three themes as examples of our effort to make one particular course, CEP 416 (Teaching and Learning with Technology), responsive to this reality:

First, the course emphasizes learning to explore and learn proactively by engaging pre-service teachers in learning by design activities, where they use tech tools to design artifacts (short video lessons, e-portfolio, etc), while considering the broader, more abstract learning from these ‘hands on’ activities.

Second, students are given an opportunity to sample some of the wide variety of innovative technologies through explorations of their own choosing. As the course progresses, the students are asked to choose one technology and develop a plan for using it in a subject matter and grade level they aspire to teach. Through innovative and adaptive technology use they begin to cultivate a proactive, independent mindset for learning with technology.

Third, the course design takes advantage of the fact that almost all of the students are immersed in social media by harnessing, for example, the power of Facebook to create a community where students learn from each other. As we integrate coursework and communication across multiple media modes, we attempt to leverage the power of online community building for learning.

Technology in Teacher Education: Considering Context

To begin we will note the broader context of the approach that the Teacher Education program at Michigan State University uses to prepare pre-service teachers to use technology effectively in the classroom.

Kay (2006) reviewed 68 studies from different teacher education programs and described 10 different strategies adopted to teach educational technology to pre-service teachers. He found that 44% of the institutions adopted the fully integrated approach, in which no single technology-focused course is offered, whereas 29% of the institutions used the single 3-credit approach previously noted, which involves having one course that focuses on training of basic technology skills. Both of these approaches have benefits and weaknesses. A less adopted strategy that has been shown to be quite effective is the combined approach where institutions use the integrated as well as the single course strategies. Currently the teacher education program at Michigan State University leans toward the combined approach, as many of the top K-6 teacher preparation programs are beginning to.

As mentioned previously, the students in this course are undergraduates with little or no experience using technology in a classroom

context. The assignments in CEP 416 are designed to introduce a mindset that will promote effective technology use in their future teaching. For that reason, the course content described here is fundamentally different from the Master’s and doctoral work, which will be discussed in later chapters.

Increasing Technology Fluency among Pre-Service Teachers

An essential goal for the course has been to increase the technology fluency of pre-service teachers by improving their confidence and flexible attitude toward technology. This is a purposeful pedagogical move, to ensure that these future teachers have a chance to gain a measure of technological confidence in a safe and flexible online environment. The opportunities to explore new technologies that we provide are intended to build an open-minded and independent attitude, so that pre-service teachers begin to view themselves as savvy users of educational technology. The foundational reason for our aim is to address the broader issue of technology integration in U.S. education. In fact, effective integration of technology in the classroom is one of the most significant challenges of the current state of education in the U.S. The State of Michigan, like most states, includes preparation to integrate technology and online learning in its Professional Standards for Michigan Teachers (Michigan State Board of Education, 2008).

Unfortunately, many educational stakeholders have noted that technology still finds disappointing levels of infusion and success in the classroom (Bauer & Kenton, 2005; Gulbahar, 2007). This problem of infusion and adoption has remained, despite large investments at national and state levels (Cuban, Kirkpatrick, & Peck 2001; Frank, Zhao, & Boreman, 2004). Constant technological evolution requires that new teachers not only be fluent with current technologies, but that they develop a mindset for learning new technology in ways that promote flexibility, autonomy, and creativity (Mishra, Koehler, & Henriksen, 2011). Developing this mindset means that teachers must learn beyond simple software training—they must learn *how* to learn with technology, developing confidence in working with technology and trying new things (Koehler & Mishra, 2005).

One might assume that developing this mindset is not a problem among young teachers of the “digital generation”. In recent years education and technology literature has coined the term “digital native” to characterize young



Figure 1



Figure 2

people born after the introduction of digital technology, who have interacted with it from an early age (thus, in theory, possessing a greater understanding of its concepts). By this age measure, all of the pre-service teachers in this course readily fit into the “digital native” category, as young “techie teachers”. Yet this is not necessarily the case.

Recent research has begun to demonstrate that many, if not most, people in the “digital native” age group are not as technologically fluent as previously assumed. Thompson (2012) found that the notion of a “digital native” is something of a myth, and that many young people within this age group do not necessarily have the fluid technology skills that have often been assumed or ascribed to them. We have also found this to be the case with many undergraduate pre-service teachers. Given this issue, much of the coursework included in our curriculum is intended to remedy this situation, and start these young teachers on a path to technology competence.

Building Websites and Learning by Design

The overarching goal of the projects in this course is to leverage the power of learning by design. Learning by design puts students in the position

of producers of knowledge through the process of creating an artifact (Kafai, 1995). In recent years learning by design has grown in prominence in research on learning, especially with regard to technology (Wiggins & McTighe, 2005; Peppler & Kafai, 2010).

Our approach draws upon the work on learning by design and extends this specifically to the design of a classroom website. This design project invites pre-service teacher education students to craft an expression of their vision of the kind of teacher they aspire to be. Designing a classroom website in Weebly seems to have tapped into their pent up desire to have their own classroom and teaching identity, leading many to create detailed websites with blogs, video, images, and imagined showcases of their future students’ work. The students seem to be designing not just an artifact but also designing a representation of their future “identity” as a teacher.

Students also create an e-portfolio that serves as a repository for lesson plans, resumes, and other artifacts the students have developed throughout the teacher education program. Having an online repository for this material is helpful for students in that it provides a convenient space in which to share with others the many artifacts they have created throughout the program. This project is intended

to get students started on developing the “teaching portfolio” required by the teacher education program.

A key challenge for these projects has been finding a web design tool that all students can access and easily use, which would also provide some flexibility to suit their needs and individual design preferences or personality. After several semesters of experimenting with various website authoring tools, we chose to recommend Weebly to our students for publishing their classroom websites and digital portfolios. This is because Weebly is powerful, yet user-friendly and intuitive. The system includes a simple drag and drop interface for novice users as well as a custom html/CSS coding interface for more experienced users. More importantly, the Weebly website design interface is accessible to either type of user—a layout many instructional designers strive to achieve.

Even though the majority of our students do not have classroom teaching experience before taking this course, we believe designing and developing websites allows them to explore new technologies, and reflect on prior experience with classroom technology integration, while projecting what technology use in their future classroom might look like. We also hope the reflective process inherent in website

design will encourage our students to utilize this important process in their teaching as well. Figures 1 and 2 are some snapshots of classroom websites designed by our students.

Design and Creativity in Portfolio and Website Building

In having the pre-service teachers create portfolios and classroom websites, the curriculum attempts to introduce web technology through the design process. Weebly is by its very nature, a clear-cut and step-by-step tool for web publishing, which might lead one to wonder if its simplicity restricts creativity or design work. But because most of the pre-service teachers in the course have never done any sort of web publishing, or technical design work in general, it is important that their understanding of design and technology is scaffolded with guidance. The user-friendly and intuitive interface of Weebly provides this, allowing them to develop a measure of confidence with basic web design for teaching purposes.

Most pre-service teachers begin by using the templated designs that Weebly offers, simplifying the process at the outset. Yet as the project progresses, we find that several possible paths emerge. For example, some of them begin to gradually dip their toes into more creative waters by beginning to customize their own templates; taking what Weebly gives them to start with and altering the original template into a new design that suits their needs.

Another design path which occurs is that some pre-service teachers choose to retain a template for their site, yet customize and develop the content to a great degree, incorporating their own photos or creative content into the site to give it a more original and personal feel. In this way, a “scaffolded” technology allows for a range of creative options and baseline technical skills in learning to build a website. Those who are entirely novice to the activity of web design have a comfortable entry point. And those

who have a bit more fluency can go farther with it, and begin to make more creative design decisions in selecting and customizing templates will allow them to make the design more personal and detailed.

Wiggins and McTighe (2005) highlight the importance of understanding content through the process of design. Mishra and Koehler (2006) suggest that learning by design is a fundamental aspect of developing a mindset for TPACK (or Technological Pedagogical Content Knowledge—the kind of specialized knowledge that teachers who are skillful at using technology to teach subject matter have). Gaining an understanding of TPACK is a relatively sophisticated skill of expertise that takes practicing teachers some time to develop. But in some basic and foundational ways, we have tried to set the stage for this among these undergraduates, by giving these future teachers opportunities to learn technology skills via the process of design.

Techsploration: Innovative Learning through Technology Exploration

One key example of this confidence-building and exploratory type of activity is in what we refer to as “Techsploration” projects. Students complete projects in which they use technology to explore technology—layered learning if you will, at both a meta-level and more specific level. Students choose a technology of interest to learn more about, and then use a screencasting tool to develop a short video articulating how the technology might be used in future classroom settings. The video may be a tutorial for other teachers potentially interested in incorporating the technology, or instructions for students on how to use the technology. The finished videos are then embedded within the students’ classroom websites and shared.

By exposing pre-service teachers to the exploration of online technologies, our intent is to further support student-centered learning and introduce them to innovative uses of

new technology, that they might not otherwise have the chance to explore. This fosters their understanding and knowledge of technological pedagogical content knowledge (TPACK)—an integrated whole for the three kinds of knowledge in technology, pedagogy, and content (Thompson & Mishra, 2007, 2008; Schmidt et al., 2009). We encourage the pre-service teachers in this course to venture into the unknown by exploring possible usage of online educational technologies such as Weebly in accordance with their respective target K-6 audience and subject matter area. These Techsploration activities promote the understanding that TPACK does not grow out of prepackaged content materials but in self-paced iterations of envisioning, exploration, and reflection on technology use and assessment.

Integration of Multiple Modes of Media for Communication

So far we have described the ways in which assignments in this course are designed to facilitate more independent and design-based learning. But communication with peers and instructors is also a key aspect of online learning, which has evolved from online forums into the use of social media. One way we have achieved this has been to integrate communication across multiple modes of media, specifically through the use of Facebook Groups. A situative perspective on learning has guided our decisions about communication in this course. This perspective suggests that in-school activities should be *authentic*, which means they should utilize the same tools and contexts as their out-of-school counterparts (Resnick, 1987). Brown, Collins and Duguid (1989) describe authentic activities as “the ordinary practices of the culture,” and communication through collaboration could certainly be considered ordinary practice for teachers. Typically in teacher education programs, this type of situated learning happens during the internship or similar field experience, not in the teacher educa-

tion classroom. However, as Kardos and Johnson (2007) point out, school environments may fall short in providing opportunities for communication and collaboration among new teachers.

Currently Angel is the university-supported platform for facilitating online learning (though this is subject to change in the impending future). Recently in this course, we replaced the Angel forums with an experimental Facebook Help Group. The decision to use Facebook as a replacement for the Angel forums was based on survey data from previous semesters, which indicated that nearly 100% of students enrolled in the course already had and actively used a Facebook account. Thus, the move to Facebook was based on the hypothesis that students might be more apt to use a technology with which they were already communicating and collaborating—which proved true. Students voluntarily used the Facebook Group to assist one another in solving technical problems, to answer course related questions and to share supplemental materials.

And, with regard to college students, “the most popular social media website for college students is Facebook, and research shows that anywhere between 85 and 99% of college students use Facebook (Junco, 2012, p. 162).” Similarly, the motivation for experimenting with replacing the Angel forums with Facebook was, in fact, its popularity and familiarity among students.

Our rationale for adopting the social medium Facebook extends beyond its popularity, though. We are using Facebook as an online space in which to situate collaborative activities for pre-service teachers, similar to those of practicing teachers. In a recent study on the experiences of new teachers, Kardos and Johnson (2007) found that many new teachers report feeling isolated and unsupported in their first years of teaching, and that they did not have many opportunities to collaborate despite, in some cases, working in schools with mandatory induction

programs. The most successful schools, in a study by Newman and Wehlage (1995), were those that allowed teachers the most opportunities to collaborate and help one another (as cited in Kardos & Johnson, 2007).

According to a 2010 Pew Internet research study, nearly half of all adults in America use a *social networking site* (SNS), with 92% of them on Facebook. After two semesters of use, our anecdotal evidence suggests that the move to Facebook was successful for supporting collaboration. Students have used the Facebook Group forum with much greater frequency than Angel. This is especially interesting in light of the fact that Angel forums offer a more versatile environment for communicating and collaborating than a Facebook Group. For example, the Angel forums afford users the ability to view, sort and search messages in a variety of formats while Facebook simply aggregates messages in a linear format. The affordances offered by the Angel forums should have made it a logical choice for students to communicate and collaborate, and yet students only became active once the forum was moved to Facebook.

As Granger, Morbey, Lotherington, Owston, & Wideman, (2002) put it, “Like effective leadership, the importance of collaboration cannot be overestimated: teachers need each other—for team teaching and planning, technical problem solving assistance and learning.” The asynchronous nature of the Facebook system provides both a tool and an environment where communication and collaboration can be enacted online independent of physical and spatial constraints.

Putnam and Borko (2000) caution that asynchronous electronic communication among teachers may require “the establishment of new norms and strategies for interacting (p. 11).” Interestingly, our students seem to have established their own norms and ways of using the Facebook group. Given that communication and collaboration are so essential to the work of

teachers, we argue that Facebook may hold potential as an environment in which we might also cultivate best practices for communication and collaboration among pre-service teachers, and provide an authentic context in which to situate this learning.

Conclusion

In this article we have discussed the following themes: learning to learn independently and proactively by using tools to design artifacts (short video lessons, eportfolio, etc); learning about technology through self-paced exploration; and harnessing the power of social media to create a community where students collaborate and learn from each other. Within our course, pre-service teachers’ use of social media in collaborating with one another to solve problems is a pedagogy they can use in their own future teaching. These social tools allow the creation of virtual communities of practice in the cloud.

This undergraduate course reflects our attempt to situate pre-service teacher learning in an environment where they are able to learn about design, explore innovative new technologies, and use social media to collaborate and reflect in ways that could potentially carry over into later professional practice. By modeling professional practices where pre-service teachers are learning to learn with others, we aim to teach these new teachers in ways that will carry over into their future classrooms.

We look into the future with great hope and enthusiasm that our pre-service teachers will lead the way in integrating new technologies into their teaching in ways that will benefit their students, colleagues, and the greater education community.

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