

Ushering in the 21st Century: Technology Integration in Methods Courses

Christy G. Keeler, Ph.D.
University of Nevada, Las Vegas

Subject-specific methods courses in colleges of education focus on teaching pre-service teachers instructional strategies used to deliver content. Typically, elementary level teachers are required to take mathematics, language arts, science, and social studies methods courses while secondary-level educators take only those methods courses related directly to their primary discipline. A concern is that instructors teaching those methods courses are rarely versed in instructional technology. Yet, paradoxically, preparing teachers to integrate technologies throughout their curricula requires providing opportunities to experience subject-specific instructional strategies that use technology.

The purpose of this study was to identify means for preparing future teachers to integrate technologies into their subject-specific curricula. Using action research (Schmuck, 2006), technology integration and alterations occurred throughout the delivery of a social studies methods course over a four-semester period. The intent of the study was to find ways to increase pre-service teacher's abilities to: a.) master technology skills needed within educational contexts, b.) identify and justify ways technology can enhance productivity and instruction, and c.) integrate technologies in their future content area instruction.

THEORETICAL FRAMEWORK

The National Educational Technology Standards (International Society of Technology in Education, 2004a, 2004b) are unique from other content-area standards because they cross all subject areas. There is an expectation that teachers of all disciplines use the standards for

productivity and instructional purposes and that they prepare their students to competently use technology by integrating the standards throughout instructional delivery. Likewise, there is an expectation that teachers prepare students for success in the 21st century by ensuring they are competent in use of 21st century skills and tools (Partnership for 21st Century Skills, 2004).

Some subject-specific standards also directly address technology integration. For example, standards presented by the National Council for Teachers of Mathematics as early as 1989 noted the importance of integrating technology into mathematics curricula and included an expectation that technologies be available when teachers deliver instruction. The Council states: “Calculators, computers, courseware, and manipulative materials are necessary for good mathematics instruction; the teacher can no longer rely solely on the chalkboard, chalk, paper, pencils, and a text” (National Council for Teachers of Mathematics, 1989, p. 253). The National Council for the Social Studies Standards (1994) offers another example. It addresses the content of technology by recommending students learn about a core theme of “Science, Technology, and Society” that includes standards such as: “Seek reasonable and ethical solutions to problems that arise when scientific advancements and social norms or values come into conflict” (p. 43). In addition to curricular standards, social studies teachers are expected to integrate technology into their instructional delivery. In 1994, powerful social studies education was defined in the following way:

Integrated social studies teaching and learning include effective use of technology that can add important dimensions to students’ learning. Teachers can provide students with information through films, videotapes, videodiscs, and other electronic media, and they can teach students to use computers to compose, edit, and illustrate social studies research reports. Computer-based learning, especially

games and simulations, can allow students to apply important ideas in authentic problem-tackling or decision-making contexts. If students have access to computerized databases, they can search these resources for relevant research information. If they can communicate with peers in other states or nations, they can engage in personalized cultural exchanges or compare parallel data collected in geographically or culturally diverse locations (National Council for the Social Studies, 1994, p. 165)

Despite these expectations, teachers tend to neglect using technology in their classrooms, or they tend to use technologies ineffectively (Cuban, 2002). Teachers are simply unprepared to integrate technologies because they lack training in integrative techniques. Because the financial and time costs of re-training teachers is exorbitant, it behooves those in colleges of education to ensure teachers enter the teaching field having basic knowledge of curriculum-specific technology integration.

RESEARCH METHODS

This study involved the creation and refinement of a face-to-face social studies methods course taught at a public research-intensive university in the southwestern United States. Course development began in August of 2005 and continues in a refinement process. The technology-rich course was taught to ten sections of approximately 25 students each, two-to-three sessions per semester over four semesters. The same instructor taught all sections and engaged in reflective practice throughout the study period.

Because the intent of this study was to create a technology-rich methods course, course development involved a concentrated effort to integrate technology without sacrificing content

normally introduced in social studies methods courses. There was a pronounced effort to utilize technology whenever possible to assist in course management as well as instruction during class sessions. For example, PowerPoint slideshows substituted transparencies, blogs and email replaced land-line telephone contacts, attendance records were collected using a handheld computer, and a course website took the place of the syllabus and course outline.

The research questions for this study were:

- Can technology be effectively integrated into subject-specific methods courses without sacrificing content normally taught in these courses?
- Which technologies are most amenable for use in subject-specific methods courses?

This study used Mertler's (2006) action research method of reflective practice, experience, and artifacts to connect theory and practice for the improvement of educational practice. By developing and testing possible means of integrating technologies within the sample methods course, this study enabled a level of critical reflection and artifact collection contributing to the scientific integrity needed for quality research practice. During the two-year study period, the course underwent continual refinement in reaction feedback. Feedback artifacts contributing to this reflective process included:

- Formal teacher evaluations mid-semester and at the end of the semester;
- Informal communications including email communications;
- Audio feedback at the end of each semester;
- Student assignments completed throughout the course
- Instructor reaction to successes and failures of technology use during instruction and for student independent work; and,

- Student portfolios completed throughout the semester and submitted at the conclusion of the course.

RESULTS

Technology integration occurred in two primary formats: administrative productivity and instructional delivery. In terms of administrative productivity, course materials and grades were made available online and the instructor modeled technology-rich record keeping strategies. Instructional methods, then, were interspersed throughout the course with an expectation that students would seamlessly utilize technologies to complete course tasks. The below sections address these productivity uses including the course website and record keeping, followed by a report of instructional uses including in-class activities and student assignments.

Productivity Uses

The Course Website

A key feature to creating a technology-intensive course requires making course materials available online. Many instructors now make their syllabi and course outlines available online and some include additional course resources like lecture slideshows and assignment requirements. Often, these resources are available only to students in the course and are password protected within a learning management system (e.g., Blackboard). Though some resources in this study were made available via WebCT (the learning management system available for use with the sample course), most resources were available via a publicly accessible website (see <http://coe.nevada.edu/ckeeler/SSM/>). Only resources requiring copyright protection, most communications, and private student information appeared within password-protected areas.

I made this website publicly accessible because I realized that my goals for the course extended beyond the semester during which the course was in session. I wanted students to see the site as an ongoing, growing, and available resource they could reference in the future. As such, it was necessary to include materials within the website that could be useful beyond the course. To make the site robust, I added features that would aid students throughout the course, but would also provide adequate detail needed to replicate course strategies in students' future classrooms. For example, during one class session, I introduced learning styles using a "Hershey's Personality Type Indicator" (a humorous way to help students see their similarities and differences). One semester after taking the course, a student emailed me with the following request: "It's [student name] for [sic] SS methods last semester.... I really want to do the icebreaker you did with the chocolate bars and the personality test.... Can you send me the information or call me ASAP...I really appreciate it..." Another student emailed: "[C]ould you please email me back with your class website? I was wanting that lesson plan that you did about the boat traveling to America (it might have been the Pilgrims traveling) and you had a boat drawn on the floor and everyone had to stand on it." For both of these students' questions, I was able to respond with a single URL providing the lesson plan delivered during their class session. The lesson plan linked to all materials needed to complete the activity including a K-12 lesson example, online extension resources, a list of needed materials, and detailed activity descriptions. Creating a website that includes basic course resources like a course syllabus and outline, but links to more materials including lesson plans, audios of class lectures, lecture slideshows, resources needed to engage in the lesson activities, and links for more information, is extremely time consuming for the instructor. But, it models good instructional design, reinforces lesson

planning techniques, provides an advance organizer for student review before class, and offers a resource for students to revisit even after leaving the institution.

Through the course of this study, the basic structure of the course website did not change, but the number and quality of linked resources did change. For example, though the original site included session lesson plans, all required materials to implement those lessons, and links to lecture slideshows, it did not include audios of in-class lectures (recorded using an iPod during class sessions). These were added to assist students who missed class, and they further proved useful for students with hearing impairments. The number of embedded links also grew over the semesters. As students asked questions about resources related to specific content, it was possible to add links within session lesson plans. The links were then available to students in future semesters. Added links also were helpful when invited speakers addressed the class. When they mentioned a website, it was added to the course resource list. During later semesters, it was easy to share these websites during the speaker presentation and students did not feel obligated to quickly write down URLs during the presentation; instead, they focused on the presenter's content. Another added feature was links to just-in-time training videos. When students needed to use an unfamiliar computer program, links to video trainings were embedded into lesson plans and assignment expectations.

Over the course of this study, even more added resources proved beneficial. For example, adding pictures and a slideshow from a previous class session to the homepage increased the sense of community for the class. Another added website improvement related to course readings. Because one of the required texts was royalty-free, students could elect to purchase the printed text from the bookstore, or review an online version. For students facing financial struggles, this was quite helpful. For some students, however, the heavy use of online resources

was detrimental. For example, when responding to ways to improve the course during end-of-course evaluations, one student wrote: ““I would not expect or rely upon as much outside reading using technology. We all do not have as much access to technology as we would like to have.” Another student wrote: “The reading assignments were very informative, however, it was a major strain since I don’t have access to the internet daily.” Note that students did have free printing available in their college and that the readings were posted before the semester commenced.

As the study progressed, one added feature was links to classroom-ready K-12 lesson plans. While the course website always included detailed lesson plans for each class session, activities seldom perfectly mimicked methods in K-12 classrooms. With the addition of K-12 lesson plan samples, students could: 1.) use the lesson plans in their future classrooms; 2.) see the flexibility of the teaching methods as they could be used in both K-12 and collegiate environments; and, 3.) modeled lesson plan formatting.

Finally, to ensure students could successfully participate in a technology-rich methods course, the following statement was added to the course syllabus in a section called “Tips for Success”: “Regularly and competently utilize technology in your assignments. If you are not familiar with technologies introduced in class, see your instructor or review online videos such as those available at: <http://coe.nevada.edu/ckeeler/Computers/TrainingVideos.html> and <http://www.atomiclearning.com/>”

The course website proved to be an important resource for students. Though the end-of-course evaluations focused on content of the course, several students specifically noted in these evaluations that one of the most positive things about the course was the course website. For example, one student wrote: “... Expansive and engaging material. Everything could be viewed

online. Great instructional planning...” Another wrote: “I am keeping your email address and the website URL so I can email you with any social studies questions I may have when I begin teaching!”

Communication Methods

Instead of using email capabilities available within the learning management system, students were recommended to email the instructor directly. This taught them that the instructor was available outside of the learning management system; and, I believe, this contributes to their continued communications with me following completion of the course. Other course communication methods included use of blogs, cell phones, and audio files.

Blogs, existing within the learning management system to maintain student confidentiality while providing open access to all class members, were used for student-to-student and instructor-to-student communications. The blogs helped develop a sense of community for class members by allowing them to introduce themselves at the beginning of the semester and share personal information and thoughts throughout the semester. They also provided opportunities for students to work as colleagues, asking questions of the whole class (including questions relating to how to work specific technologies) and having opportunities to respond to questions from their peers. Some course sections had very active blogs while others remained relatively silent. There appeared to be a correlation between courses in which students were socially active within the course blog as well as academically active; those sections with few social communications seldom used the blog academically. This is certainly a topic worthy of further study.

Students were encouraged to email or call the instructor with any questions or concerns. On the first day of class and available from the learning management system homepage for the

course, students were provided with the instructor's personal cell phone number and informed that they would likely receive phone calls from their instructor. Instructor-initiated communications usually occurred after an unarranged absence or they followed either exceptional or poor performance in class. To facilitate these communications, on the first day of class students provided their personal contact information including their name, phone number(s), home and email addresses, and a picture. To collect this information quickly, all information was downloaded from the university system so students only had to update the information and add pictures. They updated the information either at a laptop computer station or using a handheld computer passed around the classroom. Both technologies had embedded cameras; and, data synchronization occurred following each session. Collecting this information began to create a feeling of accountability while teaching students about information access and databases. Over the study period, student telephone calls to the instructor increased each semester. Though some students called more often than others did, no students abused the privilege of having a personal cell phone number. In addition, some students chose to text message to the instructor's cell phone, a method showing their technological comfort levels.

A third communication method was audio. Following completion of formal end-of-semester evaluations, students were asked to leave audio messages using an iPod and iTalk so the instructor could receive immediate feedback (note that new semesters often commence before receiving official feedback from the previous semester). Few students chose to leave audio messages and many felt uncomfortable speaking into a microphone. Most messages were very short (approximately 10-15 seconds) and though some messages included detailed feedback (i.e., telling which readings to keep and which to delete in future semesters), most were very general (e.g., "I learned a lot in this class...").

In addition to student-generated audios, I used audio to provide feedback to students on their final course portfolios. While this method has practical application (it decreases the stress of writing on the carpal tunnel), it also teaches students the benefits of audio feedback. Surprisingly, I found that the amount of feedback I provided to students was exorbitant when compared between verbal and written methods. While students receive approximately 200-word written responses, audio feedback varied from four to twenty minutes.

Administrative Record-Keeping

I used the grade book within the university's learning management system so students would always have accurate and timely access to their progress. This system teaches students the importance of timely grading (a virtue teacher educators hope their students will practice when teaching in their own classrooms), the importance of accuracy, and the ease of using electronic grade books.

Another record-keeping technology used during the study was a handheld computer/cell phone. Because the sample course was experiential and required active participation, attendance in all class sessions was mandatory. To ensure student participation as well as make a personal connection with each student during each session, I took attendance using "Documents to Go" with a native Excel file on my handheld computer. Because the information was available on my cell phone, I could easily review attendance and contact students using a hands-free headset during long commutes. While the attendance assisted in record keeping, it also modeled one way to use handhelds educationally. Because handhelds are still relatively new to classrooms, it is important to begin exposing pre-service teachers to this technology and its educational uses early in their teacher education programs.

There are two main reasons for heavily using technologies as productivity tools within subject-area methods courses. First, the technologies ease the work of the instructor while providing up-to-date and accurate data. Second, and more importantly, teachers should be prepared to immediately begin using technologies when they enter their own classrooms. Pre-service teachers must be ready to “apply technology to increase productivity,” and “use technology to communicate and collaborate with peers, parents, and the larger community in order to nurture student learning” (International Society of Technology in Education, 2004b). This preparation begins with modeling in methods courses.

Instructional Uses

Though it is important to train future teachers to use technologies for productivity purposes, their true power, and their alignment with 21st century skills, comes when the tools and techniques are used instructionally. Moreover, though instructors can practice and demonstrate productivity methods throughout all teacher education classes, curricular integration of instructional technologies finds its panacea in methods courses.

In the sample course, instructional uses appeared in two formats. First, students utilized technologies during in-class activities allowing them to witness model uses of instructional technologies as they relate to, in this case, social studies. Second, students used technologies to complete required assignments. In some cases, technology use was required; in other cases, it was optional. When using technologies for assignments, pre-service teachers practiced both productivity skills and instructional integration skills.

In-Class Activities

In-class activities included use of concept mapping software, subject-specific software, online tools, video streaming, and digital still and video cameras. In each case, technology use was understood to be transparent and ubiquitous after an explanation and demonstration of the individual technology type. For example, students were introduced to Inspiration (concept mapping software) during the second class session. To introduce the software, the whole class created a concept map of the previous sessions' readings. This reinforced the importance of timely completion of readings, demonstrated the software, and showed how it could be used for instructional brainstorming. In addition, students saw examples of K-12 student-made social studies specific concept maps (i.e., a push-pull comparison of immigration factors and a K-W-L of the Battle of Bull Run).

Throughout the course, I demonstrated a variety of online tools. For example, when engaged in timed activities, I employed an online countdown timer. The related lesson plan included a link to this timer for students' future use. In another instance, I used a rubric generator to introduce students to creating assessment rubrics.

Other than simple instructor-led demonstration, there are times when students engage with the technologies during class time using university-supplied laptops. These lessons often require technology use demonstrations before beginning the assigned work. For example, when teaching about inquiry (a popular instructional strategy within the social studies), one learning station required review of streaming video clips. In preparation for this station, students received a demonstration of unitedstreaming™ and introduction to its social studies resources. Afterward, students moved to assigned stations and began using the technologies. The instructor remained available to assist with technical or use difficulties. In another case, students used digital video and still cameras during class time to record events of a mock trial. Because these are common

technologies, there is no need for instruction on tool use, but there is a need to describe potential uses of capturing still and video images for learning or reinforcing social studies content.

Another way students learned about digital camera use for reinforcing social studies content was through a semester-long picture-taking project. During nearly every class, the instructor or students take pictures of class activities. This helps develop a sense of community in a social studies classroom, is intrinsically motivating for students, and provides a nice documentary of events from the semester. Near the end of the semester, one student wrote: “I was wondering if you could email me the pictures you have taken of me during class. I just recieved [*sic*] a few photos of me teaching in my first practicum and I think it will be neat to put those in my portfolio and to later look at the growth and changes from my first year teaching throughout my career. I think it would be a great asset to both the portfollio [*sic*] for this class as well as the portfolio for my interview with the district.”

At the end of the semester, I compile the pictures into a video with music and display these on the last day of class. The video works as a review of the content introduced throughout the semester and helps students gain a gestalt of course themes. In addition, I provide these videos in DVD format as gifts to students and use them as a resource for my personal teaching portfolio. One student wrote: “I will love the DVD and can't wait to get it in my portfolio!”

Though the sample course focuses on transparent technology integration methods throughout the semester, there are some in-class lessons in which technology takes “center stage.” In one lesson, students are introduced to curriculum specific software by playing a Tom Snyder Decisions, Decisions! simulation as a class. This introduces students to one popular social studies software package, and shows how software can be used to guide whole class instruction. During a learning centers lesson, one of the learning centers requires students play

“Where in the World is Carmen Sandiego?”, showing how instructional software can also be used with small groups and individuals to reinforce skills.

In another lesson, students are introduced to webquests by engaging in a webquest that requires them to find online social studies resources. Note that this lesson was added midway through the research period because the growth and popularity of webquests became evident. Due to the pace of change in instructional technology, it is critical that teacher educators remain abreast of developments such as these. The lesson introduces students to webquests, provides examples of social studies webquests, and requires students locate and record quality social studies websites in a social bookmarking site. I also introduce educational and social studies-specific uses of social bookmarking. Many students report the session after this lesson that they have started their own social bookmarking site. For more information on this lesson, see “Modeling Technology-Based Social Studies Instruction: A Simulated Webquest” (Keeler, Under Review).

Assignments

Students truly practice technology skills when completing independent course assignments. Some of the assignments designed for this study require students use technology instructionally, but almost all require students use technology for productivity purposes. The goal of requiring students to use technology to complete assignments is to increase student comfort level with technology. Decade-old research, such as the Apple Classrooms of Tomorrow research, supports that teachers begin the process of instructional integration by first getting comfortable with the technologies (Keeler & Langhorst, Under Review; Office of Technology Assessment, 1995).

Of the course assignments, one spans the entire semester. When students complete each assigned reading, they must post a synopsis of that reading in private blogs within the learning management system. The time/date stamp for the entry must be before the class session following the reading assignment. This ensures students are prepared for the content of the session because they read the background information for the session; and, it requires students reflect on the reading while practicing professional writing. Through the research period, this assignment changed for several reasons. The original assignment required students place their entries in private threaded discussion forums accessible only to the students writing the entry and the instructor. As blogging became more accessible, blog-based journaling techniques made the process easier on the student and instructor. A second major change was the writing expectations. Students commented that writing synopses for all readings was repetitive. As a result, the assignment alters after midterm in the semester. Once clear that students can write professionally and they adequately comprehend the material, students are given options for their reading assignments. Though they still must submit posts before each class session, they may respond to instructor prepared questions, write an individually conceived synthesis, or continue to write synopses. Many students choose to continue writing synopses because they find that these are easy to write and they provide a nice future reference. In addition, I break longer readings in half and offer students opportunities to collaborate in pairs. All students must submit reading posts, but their posts may be written partially by themselves, and partially by their partners. This requires students practice electronic collaboration and time management. As a result, collaborative entries are much more detailed than individual entries. Though each student in the pair is only responsible for reading half of the assigned reading, they tend to construct posts of much higher quality when they know their peers will be using the entry as well. Though

grading all submissions can occur electronically, it is still necessary to review all posts for content accuracy.

Students also must engage with technology to complete their readings. Most readings are available online. Though many students print out these readings, others simply read from computer monitors. To support the notion of a paperless society and align with ecological mindedness inherent in social studies education, students are only required to print a minimum number of readings. In some cases, readings appear in only audio format. When identifying podcast episodes meeting the needs for the course, these are added to the “readings” resulting in the present course iteration containing two podcasts. For some readings, students have choices in “reading” format. Students may choose to read the text, or listen to MP3 readings of the text. Though some students prefer audio, others find through this experience that they are very weak auditory learners. In fact, one hearing-able student was unable to complete reading assignments available only in audio format because the format for learning was so uncomfortable. It also became apparent that students prefer shorter podcasts. Unlike text-based media, it is not possible to skim audio files and, therefore, requires more study time. Though no students with documented visual impairments have enrolled in the course, the one student with a hearing impairment was able to be successful with the audio “readings.” For these, she was able to increase the volume to meet her needs. It would be ideal to offer all readings in both audio and text formats to accommodate both students with disabilities and those with varying preferred learning styles.

Another attempt to integrate technology into assignments proved to be a failure. During the first semester of this study, the syllabus required students create online e-portfolios in lieu of taking final exams. I quickly learned that few students had the technical ability to create their

own websites, and fewer had the skills needed to efficiently create a full e-portfolio. This was true despite the fact that the university requires a technology course at the 200-level in which students must create an e-portfolio. Because of the lack of technical skill, I altered the assignment to be a portfolio and said I would accept e-portfolios.

As blogging technology has eased the process of creating online portfolios (see, for example, <http://coe.nevada.edu/ckeeler/Computers/Lessons/Movies/IntroToBlogger.mov>), I have begun encouraging use of e-portfolio submissions while continuing to accept paper-based submissions. I also allow students to use other media for portfolio development. Several students have self-selected to create slideshow-based e-portfolios.

Most assignments require students competently use technology. For example, the first assignment of the semester requires students develop their social studies philosophy of education. They created general education philosophy statements in earlier courses so this assignment only requires they reposition those ideas within a social studies context. A second difference from their previous philosophy of education assignment is that the product must appear in concept map format (note that I require students use Inspiration because this tool is freely available to teachers in the local school district). Students struggle with the assignment because they know little about framing their ideas in a social studies construct, but most do not struggle with the use of concept mapping software. In fact, most enjoy the opportunity to create a visual product as it offers an alternative to the usual “papers” written throughout their program and it models an instructional method they could use with their students.

During the research period, I found that some students did struggle with the technology. In particular, students who had not enrolled in college courses for extended periods tended to approach the concept map assignment with more fear than excitement. Adding just-in-time

training videos (mentioned previously) alleviated many students' fears. All students had success with the use of the concept mapping tool and many remarked on their pleasure with having used it. One student emailed the following:

I want to thank you for taking the time to explain the Inspiration software. I was so excited to have been introduced to a program that will help us be more effective teachers and students. Clearly I have not developed my philosophy for the assignment, but I am having a great time learning the variety of products Inspiration can create. At the end of class I was feeling slightly overwhelmed, but I am certain this class is going to be rewarding and has already provided resources to help me be a more effective teacher. Thus far in my education I have not utilized the technology that is available and am interested to learn more of some of the areas you mentioned in class tonight. I am still in awe about the information you post online for your students. Thank you for the guidance and introduction to the Inspiration software.

Students also use electronic templates to complete some assignments. For example, students complete a detailed social studies textbook evaluation form. Using the "Forms" option within Microsoft Word, these are easy to create and guarantee student products look uniform and address all required assignment components. In other cases, forms ensure students include all research-based components of an assignment. For example, I provide lesson plan templates for students, but do not require they use these templates because they may feel more comfortable with other lesson planning formats. I also provide templates for unit planning, but require students use these because most students have no experience with thematic unit planning before this methods course. The original rendition of this course used printed samples for student

review, not electronic forms. The printed examples led to a lack of professionalism in student products that was gained when provide electronic forms. In addition, more technically adept students learned new technical skills from use of the “Forms” feature.

In one assignment, students choose the media for reporting their results. They critically observe two social studies classroom lessons taught in K-8 environments and report their findings (based on pre-defined criteria). Though many students choose to submit projects using Dinah Zike paper-folding techniques, many others choose electronic formats. Students have chosen to submit electronically developed tri-fold brochures, newsletters, slideshows, movies, and, yes, even papers. Two students submitted audio files; one used the “Notebook” feature of Microsoft Word while the other used an MP3 recording device. Students comment that they enjoy this assignment because it allows them to learn the content while being creative in their area of preference. They also note that this gives them an opportunity to practice alternative assessment techniques they may wish to use in their future classrooms.

Finally, I encourage students to take advantage of electronic resources when completing their assignments and require they include opportunities for their students to use technology as part of their unit planning assignments. Of course, students know to complete online searches when seeking materials for use with their lessons and units. Some, however, forget to look for other online instructional resources such as games, webquests, or general tools such as the timer mentioned previously.

When addressing alternative assessment for social studies classrooms, I introduce grading and rubric generators and show students examples of rubrics created using online tools. I highly encourage students to use these tools when they create the required rubric accompanying their assessment assignment. One surprising finding during this study was that many students each

semester feel uncomfortable using online rubric generators. Their hesitancy is not because of their inability to use the tools, but because they feel they are “cheating” by using these easily available resources. I regularly hear students encouraging one another to use these resources because “it makes it so easy,” but I find that I must reinforce the recommendation by stating that our goal is to create successful learning opportunities, regardless of whether that means using a process that eases their load. I remind students that the results of these tools include copyright notices and that they will have to significantly modify the computer-generated rubrics to make them align with the assessment they created for their students.

Other than the course outline, the one course website feature that probably most attracts students is a page called “Exemplary Student Works.” With student permission, I post assignments of students who engage in exemplary work. Future students may visit these examples as they prepare their own unique products. Many students also feel it is an honor to be asked to have their products posted on this webpage and are excited and humbled when asked to have their work included.

DISCUSSION

Though action research does not result in analytic generalization (Blichfeldt, 2006), this research does evidence that opportunities for successfully integrating technology into social studies methods courses exist. Furthermore, these methods are seemingly transferable across all content area methods courses. For example, content methods courses tend to teach about adjunct materials including audio-visual material. To introduce this material, instructors may opt to present video clips using video-on-demand or audio via podcasts or MP3 files. Additionally, methods instructors tend to address means of identifying content-related resources. In a technology-intensive methods course, this process can be taught by having students complete a

webquest that requires them to identify online resources. The activity can go one step farther by requiring students evaluate and record their findings using social bookmarking techniques (Keeler, Under Review). A third technique for integration is particularly useful in elementary-level methods courses. Elementary-level methods instructors tend to introduce examples of learning stations. In addition to typical learning station examples, instructors might add computer software (allowing students to practice using the software on laptops), handheld computer games and simulations, and other computer-based educational toys (e.g., LeapFrog products).

Students in methods courses even realize the usefulness and transferability of instructional technology techniques. When asked at the end-of-semester a question about positive learning gains in the sample course, one student wrote: “Focused on integrating technology into all subjects. Practical methods and lessons... Great use of technology. Many instructional strategies.” Pre-service teachers clearly realize that the tools they learn are useful for many educational purposes and they are grateful for the opportunity to learn about and have opportunities to use the tools.

In addition to the above examples, this study identified many more means of integrating instructional technologies into methods courses. Some of these include:

- Use of concept mapping for brainstorming and student assignments;
- Use of electronic readings in addition to paper-based readings;
- Electronic availability of previous exemplary student works for current student examples;
- Universally available access to course materials (including class slideshows and referenced materials) and lesson plans;
- Immediate availability of audios of class lectures;

- Access to just-in-time training videos to assist students in utilizing technologies;
- Use of templates to complete assignments;
- Blogging as a means of answering student questions and providing peer-to-peer support while building classroom communities;
- Use of blogging for students to reflect on their readings;
- Demonstrations of software and other tools that teach or reinforce skills or strategies (e.g., Google Docs when peer editing in language arts classes, Tom Snyder's Decisions, Decisions! for use in social studies);
- Use of online tools (e.g., timers, rubric generators); and,
- Display of photo documentaries of student experiences throughout the semester.

In future iterations of this course, I will begin using publicly available blogging technology (as opposed to solely relying on blogs existing within learning management systems) for sharing public information, provide exemplar assignments in graphic and HTML formats instead of in second-generation formats, and identify ways to increase peer-to-peer academic communications within course blogs. I would also like to further explore copyright issues to identify means of decreasing the number of places students must look for needed resources.

A complication with using these technologies in methods courses is that their use requires technical training during time that should be dedicated directly to the content of the course. Though some students come knowing to use the technologies introduced in this study, many do not. Instructors must counterbalance the need to teach the technology with its usefulness in their given content area. Through this study it has become clear that even though students may know

how to use specific technological tools, they seldom know how to utilize those tools in educational environments, and even fewer students have ideas on how to use technological tools to enhance and reinforce content learning.

CONCLUSION

As colleges of education prepare 21st century teachers, they must accept the responsibility of integrating technological tools throughout their curricula. This includes ensuring that content methods instructors teach instructional strategies that seamlessly connect 21st century tools with 21st century content. While it is still necessary in many institutions to continue to teach a course on integrating technology into schools from a generalist perspective, it is no longer acceptable for higher education institutions to leave this responsibility solely to their educational technology faculty. All faculty members must prepare students for the 21st century and all methods courses must teach strategies enabling pre-service teachers to transparently and ubiquitously integrate technologies into their future classrooms.

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