Hofer, M., & Owings-Swan, K. (2005). Digital moviemaking—the harmonization of technology, pedagogy and content. *International Journal of Technology in Teaching and Learning, 1*(2), *102-110.*

Digital Moviemaking—The Harmonization of Technology, Pedagogy and Content

Mark Hofer
The College of William and Mary

Kathleen Owings Swan
University of Kentucky

Technology integration in K-12 classrooms resembles the "hammer in search of a nail" phenomenon. While increasingly powerful and accessible technology tools certainly offer promising potential to impact teaching and learning, their implementation can often be contrived or incongruent with classroom practice and discipline-specific pedagogy. Digital moviemaking provides a unique opportunity to connect powerful, yet accessible, technology integration with core content and pedagogical practice within specific academic disciplines. This paper explores the digital disconnect between student use of technology in and out of school, the typical problems with integrating technology in K-12 schools, the potential of digital moviemaking, an examination of a digital documentary project in the social studies, and a discussion of next steps.

Keywords: Technology Integration, Social Studies, Digital Images

THE TIPPING POINT

Seymour Papert (1993) writes that education is perhaps the only profession that has not changed in substantial ways over the last 100 years. While medicine and other professions have been transformed using technology, education has remained relatively unchanged by the exponential advances in computing power, access and usability (Cuban, 2001). As pockets of innovation exist around the country and around the world

---

Mark Hofer is an Assistant Professor in the School of Education at the College of William and Mary. Kathleen Owings Swan is an Assistant Professor in the Department of Curriculum Instruction at the University of Kentucky. Please contact Dr. Hofer at the College of William and Mary, School of Education, PO Box 8795, Williamsburg, VA 23187. E-mail: mjhofe@wm.edu

in which students use powerful technologies to enhance learning and as tools for inquiry, there is a significant *digital disconnect*. The Pew Institute (2002) defines this disconnect as the growing discrepancy between students' use of the Internet in rich, dynamic and authentic ways outside of school in contrast to their limited, rote use in school.

To compound this concern, technology leaders point to a technological tipping point in the not-to-distant future (Bull, Bull, Garofalo, & Harris, 2002; van Hover, Swan, Berson, & Bolick, in press). A point at which an innovation reaches critical mass and begins to spread rapidly may enable all students to have ubiquitous access to personal wireless computing devices. On the surface, this may sound like one of the many failed predictions of a technological revolution in education (Cuban, 2001). However, those pointing to this technological tipping point argue that ubiquitous computing for students is inevitable as technology continues to evolve and become more affordable (Bull et al., 2002). This assertion is supported by the principles embedded in Moore's Law, which states that the number of transistors on integrated circuits doubles every eighteen months. This increased computing capability increases functionality of devices while simultaneously lowering costs, which leads to more powerful *and* affordable electronics. While the idea of pervasive computing may widely appeal to today's students, it poses daunting challenges for schools, teachers and the traditional approaches to teaching and learning.

DIGITAL WORLD IN AND OUT OF SCHOOL

Today's students are growing up in a world very different from many of their teachers. This digital world is a place in which children are bombarded with varied forms of media that communicate an unprecedented amount and breadth of information. Rather than feeling overwhelmed with what adults often refer to as information overload, students today often thrive in this fast-paced, multi-tasking, multi-sensory world (Frand, 2000; Pew, 2002; Tapscott, 1998). Given the reliance on verbal and textual transmission of information common to many classrooms, media-saturated students who seek instant gratification and sound bytes certainly pose a challenge to classroom teachers. Students of this digital generation demand a different type of school experience than those of previous generations. Students of today want to be active in the learning process, challenging the often limited perspective of their textbooks. These students and a growing number of teachers and researchers assert the need for a different view of teaching and learning than the traditional teacher-centered model of education.

The immediate challenge is for educators to explore ways to tap into this new mindset and leverage the technologies so important and ubiquitous outside of school to engage students as learners in the classroom (Bull et al., 2002). Recent research into how people think and learn (Bransford, Brown, & Cocking, 1999) point to the need for student-centered pedagogical approaches. With its roots in Piaget and Dewey, the constructivist approach to learning calls for active student engagement in the learning process, providing opportunities for students to construct their own understanding of key concepts and information (Jonassen, 1991). National, state, and local content standards are increasingly emphasizing these types of learning experiences, notably in the inquiry approach advocated by the National Science Teachers Association. For the inquiring minds of the digital generation, the World Wide Web and powerful technology tools are ideally suited to support this type of work in the classroom. This potential, however, is often misapplied when it comes to K-12 teaching and learning.

TECHNOLOGY IN THE CLASSROOM: CONTRIVED OR CONGRUENT?

In the field of educational technology, there is often a tendency for enthusiasts to gravitate towards the latest technology trend or resource and the new potential it provides. Given exciting new developments including wireless tablet computers, virtual reality simulations, digital video on handheld devices and a myriad of other innovations, there is a natural tendency to use a tools-first approach to incorporating technology in education. The danger starting with the technology, however, is that the use of technology can be separate from, and often incongruent with, typical classroom practice and lead to forced or contrived use in the classroom. There is an old saying that asserts that when you have a hammer, everything looks like a nail. By extension, when one starts with the tool and then determines ways it might be inserted into classroom practice, it could be seen as the "hammer in search of a nail" approach to technology integration. This approach is pandemic in the history of technology and education and can be off-putting to many classroom teachers (Anglin, 1995; Cuban, 2001).

A growing number of educational technology leaders and their classroom teacher counterparts are advocating a content-first approach to technology integration (Bell, 2001). In this view, technology is seen as a tool in service to the unique challenges and opportunities to the teaching and learning of important concepts in specific disciplines. To this end, the National Technology Leadership Initiative (NTLI) has developed strategies in each of the major content disciplines, including math, science, language arts and social studies, which guide effective technology use (Berson, Diem, Mason, Lee, & Dralle, 2000; Flick & Bell, 2000; Pope & Golub, 2000; Stohl Drier, Harper, Timmerman, Garofalo, & Shockey, 2000). This content-first approach is significant in that each discipline has unique approaches and emphases. For example, many scholars in the field of history education advocate historical thinking in which a student approximates the work of a historian by building historical knowledge through the use of primary sources and conducting historical inquiry (Levstik, 1996; Seixas, 1996; Wineburg, 1991; Yeager & Davis, 1996). The use of technology through this lens would and should be markedly different than in mathematics education where the multiple representations of mathematical principles are a key concern. For example, while social studies teachers may utilize web-based historical documents used to provide insight into historical events (Berson et al., 2000), mathematics teachers would more likely gravitate towards graphing calculators (Stohl Drier et al., 2000). When starting from this disciplinary perspective, technology tools and resources are selected in relation to their potential for meeting the unique challenges of the field, leading to congruence with appropriate pedagogy, and discipline-specific goals and strategies.

DIGITAL MOVIEMAKING – THE HARMONY OF PEDAGOGY, DISCIPLINARY APPROACHES AND TECHNOLOGY

Digital moviemaking offers an opportunity to harmonize the use of technology to support student-centered pedagogy and unique disciplinary approaches rooted in discipline-specific pedagogy. Digital moviemaking can broadly be defined as the use of a variety of media (images, sound, text, video, and narration) to convey understanding. In practice, digital directors utilize user-friendly non-linear video editing software (i.e., Windows *MovieMaker*, Apple's *iMovie*) to create videos to communicate information. Students can create digital documentaries of historical figures, time-lapse movies of important scientific concepts, a digital memoir or poem, or many other types of videos. The near ubiquitous access to the necessary software (*MovieMaker* and *iMovie* are bundled free with their respective operating systems), hardware (computers with Internet

access, and digital cameras), and the open-ended nature of digital movies present powerful opportunities to design student-centered, inquiry-based projects tied to the unique goals and emphases of the various disciplines.

While the research literature on student-generated video is sparse, numerous studies suggest that students benefit from creating their own videos in a variety of ways. Ryan (2002) described a project in which his classroom of English language learners produced their own video tour of their school campus. He reported that the students were highly motivated and that the project spurred the students to further develop their language skills following the project. In a series of case studies using student-created video projects in Australian schools, Kearney and Schuck (2003) reported that these projects supported student-centered, authentic learning experiences in a variety of curricular areas. The researchers also suggest that students were very engaged in the work and benefited from peer evaluation and feedback and their consideration of the audience in developing their videos. In related work, Kearney and Schuck (2005) found that these projects promoted student voice and a high degree of ownership by the students in their work. Burn et al. (2001) and Hoffenberg and Handler (2001) report similar increases in motivation and student enjoyment. Digital video projects can promote student creativity (New, 2006; Reid, Burn, & Parker, 2002), accommodate students with different learning styles and ability levels (Burn et al., 2001), and connect students with their out-of-school interests (Parker, 2002). Other projects (Swan, Hofer, & Levstik, in press; Yerrick, Ross, & Molebash, 2003) demonstrate that digital video projects can address discipline-specific skills and content. In particular, Ross, Yerrick, and Molebash (2003) discussed ways that digital video projects enhanced students' development of scientific skills and processes. These benefits can only be leveraged in teaching and learning, however, when effectively and appropriately implemented in the classroom.

STUDENT-CREATED DIGITAL HISTORICAL NARRATIVES

In recent years, there has been an increasing call for modeling the use of technology in specific content area teaching methods courses (Mehlinger & Powers, 2002). This approach is a daunting challenge as the instructor has to simultaneously consider the content to be taught, the pedagogical approach employed and the use of technology. The knowledge and skills required to effectively support teaching and learning can be referred to as Pedagogical Content Technology Knowledge (PCTK) (Zhao, 2003). The purpose of the remainder of this article is to share one example of how a digital moviemaking project was implemented in a social studies teaching methods course in hopes of modeling PCTK to support the unique curricular and process goals in the social studies. This is not a report on a formal research study, rather it is meant to provide a rich description of an initial effort and results to explore the potential of digital moviemaking in this way. The article concludes with implications and future directions.

In a graduate level social studies teaching methods course, two classes of pre-service teachers were challenged to use digital images to craft a 3-5 minute historical documentary focusing on one of six topics within the U.S. Civil Rights movement of the 1960's. The purpose of the project was two-fold. First, the students had just finished studying historical thinking as an approach to teaching history and the instructor wanted the students to experience the challenging process of analysis and synthesis of historical content and to construct an historical narrative. Historical thinking encompasses a range of skills and processes related to students' abilities to understand and relate to history in a meaningful, personal way (Levstik, 1996). This entails reasoning as historians do, favoring an active involvement with subject matter, fostering an understanding not just of

past events and people, but also of personal connections to history. Engaging students in historical thinking means asking them:

> To raise questions and to marshal evidence in support of their answers…and to do so imaginatively – taking into account the time and places in which [historical] records were created and comparing multiple points of view on the scene at the time. (National Center for History in the Schools, 1996, p. 14)

These historical processes are formalized and further delineated by the National Center for History in the Schools (1996) as a set of five core skills under the broad concept of historical thinking that include (a) chronological thinking, (b) historical comprehension, (c) historical analysis and interpretation, (d) historical research, and (e) historical issues–analysis and decision making. These benchmarks provide a guide for teachers who offer their students opportunities to explore history in this meaningful way.

Secondly, the instructor wanted the students to use technology as a medium for students to share their historical analysis, leveraging the power of web-based historical documents and the ability to use a variety of media to create a rich, multimodal video documentary.

This project was implemented in two classes over the course of two 3-hour class periods with 40 students participating in the exercise. Students had access to a computer lab while in class and through a brief, anonymous survey prior to beginning the project reported convenient access to technology at home as well. The students (21 female, 20 male, median age of 23) came into the project reporting typical computer skills (searching the Internet, word processing, PowerPoint, etc.), but no experience with the creation of digital videos and little experience with searching historical archives.

This project followed a similar pedagogical approach to other issues explored in the course. Students are introduced to a new idea, concept or strategy, given opportunity to explore and discuss, and then challenged to develop their own response. Specifically in this case, students were introduced to the documentary project as a four-step process:

Step 1: In groups of 2-3, students selected one of seven topics from the U.S. Civil Rights Movement (Brown v. Board of Education, the murder of Emmit Till, Rosa Parks refusal to give up her seat on a Montgomery bus, the "Little Rock Nine," the Freedom Riders, and the March on Washington in 1963) and explored a list of background resources provided by the instructor with the goal of becoming content experts. Ultimately, their challenge was to create a documentary to answer the question of legacy, specifically, "In what ways do we remember this event?"

Step 2: Students then followed along with a demonstration of Windows *MovieMaker* software by the instructor and practiced with both printed and web-based tutorials to help them understand what was possible with the software. Additionally, they were given a short tutorial on search engines as well as exploring and downloading materials from historical archives.

Step 3: Groups then collected resources (video, sound, photos, music, etc.) and storyboarded the documentary using a word processing template provided by the instructor.

Step 4: Students constructed the video using the collected resources and their written narrative to present their topic in a 3-5 minute documentary film.

SUCCESSES

Classroom observations and voluntary follow-up interviews with randomly selected students by the external researcher revealed that students had very little difficulty with any one aspect of the project and were engaged with the process, despite the fact that it

took place at the end of the semester when interest in new material often dwindles. Despite some initial worry by the instructor and a few comments by the students as the project was introduced, surprisingly few technical obstacles interfered with the groups' progress. The documentaries "premiered" to an audience of teacher educators and pre-service teachers in a film festival atmosphere complete with popcorn and Grand Jury Awards voted upon by a panel of jurors (samples can be found at http://www.ddguild.org/examples.html).

While the students were engaged in the project and reported enjoying the experience and feeling pride in their finished movies, a closer examination of the specific disciplinary skills and processes focused upon in the project, namely engaging students in the historical thinking process is warranted. To gauge the student's success in using digital moviemaking to foster historical thinking, a set of benchmarks was employed.

The documentaries were measured against the NCHS benchmarks, specifically in the students' ability to sequence events and to tell a story, skills encompassed in the historical research, chronological thinking, and historical analysis and interpretation benchmarks. The students engaged in historical research by mining historical archives and using search engines to find a diversity of primary sources that included period music, video, eyewitness accounts and photographs. As part of this process, they were also instructed to interrogate the data for the "who, what, when, where, and why" of each event. Additionally, students engaged in chronological thinking. According to NCHS (1996), chronological thinking does not equate with the memorization of historical events and the dates they occur; rather, it was the student's ability to explain patterns of continuity and change through the sequencing of historical events that the technology helped foster. Finally, in constructing their documentaries, students had to make sense of the historical content, not just in terms of sequencing, but also in terms of their analysis and interpretation of the historical record. This process involves identifying the source of historical documents, including the perspective and point of view of the author(s), considering multiple perspectives, comparing competing historical narratives, and making judgments about what is important in telling the story. A content analysis of the finished documentaries by the external researcher and the follow-up interviews revealed evidence across projects that, to at least a minor degree, students had engaged in each of these components of historical thinking.

CHALLENGES

Despite these successes, the instructor identified some disappointments and areas for potential improvement. Students at the beginning of the project were asked to answer an essential question in their documentary: "What is the legacy of this event?" or "How do we remember this event?" Post-project interviews revealed that some students who were adept at answering this type of question using a word processor had a difficult time translating those same skills to a digital environment that emphasized sound and visual aesthetics. According to classroom observations, students who struggled seemed to do so because they were seduced by the bells and whistles of the technology and lost sight of the primary goal of the assignment—to uncover the collective memory of a historical event. As a result, several projects lacked substance, specifically in the area of historical analysis, interpretation and comprehension. For example, two groups of students did their documentaries on Rosa Parks. Neither of the documentaries addressed Parks' prior experience with the NAACP, a significant omission in telling her story. Instead, students spent much of their time focused on the music that played in the background or getting an image perfectly cropped. The observer noted that more than half of student conversations sampled during class time related to the use of the software rather than on the content of

the project. The instructor expressed concern for this problem in a K-12 setting in which content coverage and student engagement with curricular concepts as the primary goal of instruction, not technology fluency.

Another challenge uncovered in the content analysis of the documentaries related to the often shallow treatment of the content of the documentaries. Fifteen of 22 movies could be described as electronic encyclopedia entries rather than creative and insightful treatments of the topic. This tendency to focus on heritage over history (VanSledright, 2002) is common in engaging students in this kind of work, yet may be exacerbated by the use of the digital moviemaking software and the tendency for students to focus on style rather than substance.

CONCLUSIONS AND IMPLICATIONS

Although this is a preliminary effort and the findings cannot be generalized, we are encouraged that the engaging and flexible nature of digital moviemaking projects offers great potential to ground the use of technology in discipline-specific content and processes. This experience, however, has led us to reflect deeply on the pedagogical approach utilized in the project.

To help ensure that students stay focused on the content and processes embedded in the project and not get carried away with the technology, it is important to consider the scope and sequence of teaching not only with the historical thinking skills embedded in the project, but also how to align these with the scope and sequence of learning technology skills. Analogous to the writing process, teaching technology is much like teaching students how to compose a critical essay for the first time. It needs to be done in stages, broken down with appropriate scaffolding. Additionally, the outcomes need to be modest in the beginning phases with the understanding that technology might eclipse, in this case, some of the historical thinking benchmarks. However, with more exposure, the technology and content goals may be slowly inverted so that the technology will likely fade to the background as proficiency increases.

Moreover, it is the view of the authors that innovative practice with technology and teaching should be explored in a university setting similar to that noted above before applying it to the K-12 classroom. By trying the project in a university course, the researcher will develop intuitions about the implementation process, the challenges with the technology, and other logistical issues. In addition, the theoretical and research frame can then be refined before implementation in the K-12 classroom. The implementation at the university, however, is a necessary, but insufficient, step in the process. Without trying the project in a real classroom, it is difficult to advocate its wider use in education. To this end, the authors have refined the project for implementation in a fifth grade classroom in Lexington, Kentucky (Swan et al., in press) and are planning other iterations. Only in this type of authentic setting can real understanding of the potential and challenges of digital documentaries be understood.

Finally, the flexibility of designing a digital moviemaking project to simultaneously engage students in learning content and processes and practicing discipline-specific skills can also be an impediment. It is a challenging endeavor for a teacher to manage and scaffold multiple layers of learning in this type of project. Until the body of research grows in this area, it would be advisable for researchers and practitioners to share their findings, techniques, successes and challenges to assist classroom teachers to harness the potential of digital moviemaking to effectively connect technology, pedagogy and content.

REFERENCES

Anglin, G. J. (1995). *Instructional technology: Past, present, and future*. Englewood, CO: Libraries Unlimited.

Bell, L. (2001). Preparing tomorrow's teachers to use technology: Perspectives of the leaders of twelve national education associations. *Contemporary Issues in Technology & Teacher Education. 1* (4), pp. 517-534. Norfolk, VA: AACE.

Berson, M., Diem , R., Hicks, D., Mason, C., Lee, J., & Dralle, T. (2000). Guidelines for using technology to prepare social studies teachers. *Contemporary Issues in Technology & Teacher Education 1*(1), 107-116. [Online]. Available: http://dl.aace.org/9013

Bransford, J., Brown, A., & Cocking, R. (1999). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Research Council and National Academy Press.

Bull, G., Bull, G., Garofalo, J., & Harris, J. (2002). Grand challenges: Preparing for the technological tipping point. *Learning and Leading with Technology, 29*(8), 6-12.

Burn, A., Brindley, S., Durran, J., Kelsall, C., Sweetlove, J., & Tuohey, C. (2001). The rush of images: A research report into digital editing and the moving image. *English in Education, 35*(2), 34-47.

Cuban, L. (2001). *Oversold and underused: Computers in the classroom.* Cambridge, MA: Harvard University Press.

Flick, L., & Bell, R. (2000). Preparing tomorrow's science teachers to use technology: Guidelines for science educators. *Contemporary Issues in Technology & Teacher Education 1*(1), 39-60. [Online]. Available: http://dl.aace.org/9010

Frand, J. (2000). The information-age mindset: Changes in students and implications for higher education. *Educause, 35*(5), 14-19.

Hoffenberg, H., & Handler, M. (2001). Digital video goes to school. *Learning and Leading with Technology, 29*(2), 10-15.

Jonassen, D. H. (1991) Objectivism versus constructivism: Do we need a new philosophical paradigm? *Journal of Education Research, 39*(3), 5-14.

Kearney, M., & Schuck, S. (2003). Authentic learning through the use of digital video, in W. Au and B. White (Eds.) *Proceedings of the Australian Computers in Education Conference.* [CD-ROM].

Kearney, M., & Schuck, S. (2005). Students in the director's seat: Teaching and learning with student-generated video, in P. Kommers and G. Richards (Eds.) *Proceedings of Ed-Media 2005 World Conference on Educational Multimedia, Hypermedia and Telecommunications*. Norfolk, VA: AACE.

Levstik, L. S. (1996). Negotiating the historical landscape. *Theory and Research in Social Education, 24*, 393-397.

Mehlinger, H. D., & Powers, S. M. (2002). *Technology and teacher education: A guide for educators and policymakers*. Boston: Houghton Mifflin.

National Center for History in the Schools (Ed.). (1996). *National standards for history.* Los Angeles: National Center for History in the Schools.

New, J. (2006). Film school: The silver screen inspires young minds to think big. *Edutopia, 1*(9), 20-23.

Papert, S. (1993). *The children's machine: Rethinking school in the age of the computer*. New York: Basic Books.

Parker, D. (2002). Show us a story: An overview of recent research and resource development work at the British Film Institute. *English in Education, 36*(1), 38-44.

Pew Institute (2002). *The digital disconnect: The widening gap between internet savvy students and their schools.* Washington, D.C. Retrieved November 5, 2003 from, http://www.pewinternet.org/reports/toc.asp?Report=67

Pope, C., & Golub, J. (2000). Preparing tomorrow's English language arts teachers Today: principles and practices for infusing technology. *Contemporary Issues in Technology & Teacher Education 1*(1), 89-97. [Online]. Available: http://dl.aace.org/9012

Reid, M., Burn, A., & Parker, D. (2002). *Evaluation report of the Becta digital video pilot project*. Coventry: Becta.

Ross, D. L., Yerrick, R., & Molebash, P. (2003). Lights! Camera! Science? *Learning and Leading with Technology, 31*(3), 18-21.

Ryan, S. (2002). Digital video: Using technology to improve learner motivation. *Modern English Teacher, 11*(2), 72-75.

Seixas, P. (1996). Conceptualizing growth in historical understanding, in David Olson & Nancy Torrance (Eds.) *Education and Human Development*. London: Blackwell.

Stohl Drier, H., Harper, S., Timmerman, M., Garofalo, J., & Shockey, T. (2000). Promoting appropriate uses of technology in mathematics teacher preparation. *Contemporary Issues in Technology & Teacher Education 1*(1), 66-88. [Online]. Available: http://dl.aace.org/9011

Swan, K. O., Hofer, M., & Levstik, L. (In press). And action: Students collaborate in the Digital Directors Guild.

Tapscott, D. (1998). *Growing up digital.* New York: McGraw-Hill.

van Hover, S., Swan, K.O., Berson, M. J., & Bolick, C. M. (in press). Implications of ubiquitous computing for the social studies curriculum. *Journal of Computing in Teacher Education.*

VanSledright, B. (2002). *In search of America's past: Learning to read history in elementary school*. New York: Teacher's College Press.

Wineburg, S. S. (1991). On the Reading of historical texts: Notes on the breach between school and academy. *American Educational Research Journal, 28(*3), 495-519.

Yeager, E. A., & Davis, O. L., Jr. (1996). Classroom teachers' thinking about historical texts: An exploratory study. *Theory and Research in Social Education, 24*, 146 66.

Yerrick, R., Ross, D., & Molebash, P. (2003). Promoting equity with digital video. Learning and Leading with Technology, 31(4), 16-19.

Zhao, Y. (2003). What teachers need to know about technology: Framing the question. In Y., Zhao (Ed.) *What should teachers know about technology? Perspectives and practices*. Greenwich, CT: Information Age Publishing.