Social Studies, Democracy, and Technological Pedagogical Content Knowledge: A Working Example

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The connections between social studies, democracy, and technology are complicated. Point in case, although technology is put to democratic use in a number of ways such as to help address social problems, facilitate political processes, and enable access to information; technology also divides haves from have nots and is often applied in educational settings in such a way as to actually distract from democratic and authentic learning. In this paper, I consider a specific example of how technology was used as a tool for facilitating a democratically-oriented social studies pedagogical activity. Namely, I report preliminary findings from a study that looks at how pre-service social studies teachers use technology to find specific historical materials given certain pedagogical aims. In describing these findings, I use the construct of technological pedagogical content knowledge (TPACK) as a framework and broadly conceive of social studies as aimed at preparation for and experiences in democratic life.

The idea of TPACK emerged as a way to consider the interplay of technology, pedagogy, and academic content in dynamic and productive contexts (Mishra & Koehler, 2008). At its root, TPACK reflects Shulman's (1986) notion that pedagogical content knowledge develops as teachers transform their knowledge of content for pedagogical purposes, but extends this idea by introducing technology as a dynamic component in this transformative process. In a previous publication, I have suggested that social studies teachers approach this process by engaging subject matter that is "inherently technological" and by "improving" subject matter given technological adaptations (Lee, 2008, p. 130). Work with subject matter in such contexts requires pedagogical action. I

further described (Lee, 2008, p. 130-131) ten actions that might emerge in these two contexts including,

1. locating and adapting digital resources for use in the classroom,
2. facilitating their students' work in non-linear environments, requiring students to make critical decisions about how to select their own resources and navigate through a wide variety of interfaces,
3. working to develop critical media literacy skills among their students,
4. providing students with opportunities to utilize the presentational capabilities of the Web to motivate and encourage students,
5. using the Internet to extend collaboration and communication among students,
6. extending and promoting active and authentic forms of human interaction in technology enabled social networks.
7. making use of historical source materials available through online sources,
8. promoting understandings of spatial, human, and physical systems as aided by technology,
9. expanding social experiences using technology, and
10. encouraging economic literacy through the use of technology.

These ten pedagogical adaptations of the interplay between technology, pedagogy, and content knowledge in social studies emphasize social studies as directed at democratic life. Using democracy as a frame for social studies enables us to leverage disciplinary structures in social studies toward a social studies that is practical and purposeful (Lee, 2008). Teachers who adapt a democratic frame for social studies are able to extend their considerations of content beyond academic disciplines and civics to a

democratic ideal that John Dewey called a way of life. Dewey (1927) argued that democratic life is associative, constructive, and involves continual change. Life in a democracy according to Dewey requires citizens to deliberate and reflect in a communal arena where barriers to participation are minimal and individuals act in practical and meaningful ways to improve their own life and contribute to the progress of humanity. But, what does teaching and learning look like in such a democratic context, particularly given the academic structure of social studies schooling? In this study, I would like to suggest that teaching social studies for democratic life involves actions and activities that might not seem at first blush "democratic" –as in promoting some immediate democratic goal. For example, helping a learner to understand the context of a historical letter written by George Washington might not seem democratic, yet such work in history can enable learners to, as Peter Stearns (1998) put it, "gain access to the laboratory of human experience." It is in this laboratory that we develop knowledge about democratic life, and if we want young people to be productive in their democratic lives, we must provide opportunities to experiment, try out ideas, and test various accepted understandings. Similarly, work with online mapping resources or government spending data sets might not seem on their surface essential to democratic life, but again work in these academic areas enables children access to the language and workplace of democratic life.

In the remainder of this paper, I review research on the development of focused technological pedagogical content knowledge among a group of pre-service teacher education students. This account of the development of TPACK among pre-service teachers highlights a form of academically focused social studies content for democratic life that considers information as the currency of democratic life. Specifically, the

example of TPACK highlighted here is focused on how pre-service teachers developed strategies for locating information from an online historical primary source archive. This description of preliminary findings highlights the transactional nature of TPACK by demonstrating the manner in which teacher participants exchanged considerations about technology, pedagogy, and content while struggling with a real task related to enhancing their understanding of history content and pedagogy.

Background on the Study

As the amount of information available online has in recent years exploded, the overwhelmingness of these resources has become plainly apparent. A 2003 study estimated that 5 exabytes of print, film, magnetic and optical storage media information was created in 2002 (Lyman & Varian, 2003). Five exabytes roughly equates to 800 megabytes per U. S. citizen. If this information were in print form, it would be about 50 books for every person in the world or a total of almost 1 trillion books. Such estimates only account for stored information and does not include temporally generated information, such as the billions of temporary pages of information from the most popular web sites such as Google and Yahoo. As of June 2006, Google reported that it has indexed over 25 billion web pages, while recent estimates put the number of individual documents on the Web at over 550 billion.[1] It is impossible to know how much of this information is educational, but without doubt the total is significant. These digital resources share the common characteristic of enabling students to learn in ways that were not possible in print modes (Counts, 2004; McClintock, 2001). Given the potential online resources present for supplementing instruction and learning, teachers need to be enabled to access and use these resources. Furthermore, this information represents a form of

currency with which citizens exchange ideas, experiences, and ultimately power in democratic societies.

Unfortunately, finding meaningful online resources can be very difficult. Most teachers do not have to worry about whether something is available; instead the issue is how to get it. This dilemma drives the research reported in this paper. I am specifically concerned with how teachers access and use historical resources from an online resource called American Memory. My research question is: What strategies do pre-service teachers use when locating and using online historical documents from American Memory for the purpose of planning instruction, and what are the implications for democratic life?

Information Seeking as Active Democratic Citizenship

The idea that information users need to be active and critical, emerged early in the research on information seeking. Active engagement is central to current media literacy theory. The Center for Media Literacy's "MediaLit Kit" exemplifies this approach by focusing on John Culkin's original idea of "media literacy." The CML media literacy framework calls for students to access, analyze, evaluate and create media messages directed at empowering young people as global democratic citizens (CML, 2002). Within the framework of media literacy, various researchers have proposed theories and models to explain information seeking activities. Ellis, (1989) proposed an early model for information seeking activities as including the following elements: starting, chaining, browsing, differentiating, monitoring, and extracting. Ellis' studies pre-dated the Web, but provided a helpful heuristic for understanding how learners locate information in digital and non-digital environments. Catledge and Pitkow (1995) conducted one of the

earliest web-related studies and identified three prototypical web-based information users; the serendipitous browsers, the general purpose browser, and the searcher. More complex models such as Wilson's (1999) cycle of information activities, which involves intervening variables that influence and activate information seeking behavior, have also been proposed to explain the way people seek and use information online. Despite these useful models, researchers have found that most information searches are initiated in common sense fashion and the problems that emerge are mostly procedural (Kuiper, Volman, & Terwel, 2005). For example, Nahl and Harada (2004) found that subject matter background knowledge informs information users' abilities to conduct productive searches for information.

In social studies, a limited body of research exists on the strategies used to find information. Delgadillo and Lynch (1999) studied information retrieval habits among college students in a history research seminar and found that students used specific strategies including tracing references, using bibliographies, using catalogs, and talking with experts. Fescemyer (2000) studied information seeking among college students in a geography class and found they used a wide variety of online and offline sources for class project work which reflected a critical awareness while at the same time employing a strategy of least resistance to information. In a study of middle school students who were seeking information for a research project, Milson (2005) found that these younger students also followed a "path of least resistance" when searching for information. The student participants in Milson's (2005) study initially used search engines such as Ask Jeeves in an effort to quickly and easily location information related to their research topic. After problems and frustrations related to the students' inabilities to find

information, the teacher introduced a series of metacognitive and metastrategic techniques to facilitate student participants' information seeking. Milson (2005) suggested that the teacher in his study was able to transfer her own knowledge and skills to students in an effort to help them develop new skills.

Research on the strategies that teachers use for finding information is limited, but informative and primarily focused on how teachers use expert knowledge to make decisions about what information to use (see Aideen, Stronge, Rogers, & Fisk, 2006). These strategies are increasingly being incorporated into web-based interfaces through social networking resources such as H-Net from Michigan State University, George Mason University's History News Network, and History Now from the Gilder Lerhman Institute of American History.

Method

In this study, I worked with pre-service teachers as they located materials in American Memory for the purpose of planning instruction. I collected data on pre-service teachers' interactions with American Memory resources through 1) participants' written instructional plans, 2) observations of in-class discussions and email communication about participants' work, and 3) meta-cognitive writing about the processes participants undertook as they developed instructional plans. American Memory is a project of United States Library of Congress. As of June 2007, American Memory had over 9 million individual documents in over 100 collections. Each collection includes four components, a framework, access aids, reproductions, and supplementary programs (Fleischhauer, 1996). One example of an American Memory project is a collection of ex-slave interviews and narratives from the Works Project Authority (WPA). This searchable

collection includes 2,900 documents from over 300 WPA writers in 24 states. The documents were written in a variety of styles including narratives, interview transcripts, and case histories. Individual documents run between 2,000-15,000 words in length (including drafts and revisions) and include information on family income, occupation, political views, religion and mores, medical needs, diet and miscellaneous observations.

Data for this study were analyzed using the constant comparative method as derived from Glaser and Strauss' (1967) original idea of Grounded Theory. The central premise of Grounded Theory is the idea that analysis occurs during data collection and that conceptual models (or theory) explaining phenomena emerge from the analysis of data and are "grounded" in the data. The constant comparative method enables the development of these models or theories. Although this study does not represent the breadth of findings needed to develop a grounded theory, the constant comparative analytical approach was used to establish findings that are grounded in the data.

The participants (N=84) were pre-service social studies teacher education students in four separate graduate level social studies courses, taught over four consecutive years. The courses were the second of two methods courses in a graduate teacher education program. Participants used digital historical resources from American Memory (AM) to conducted historical inquiries. Following this subject matter research, participants wrote instructional ideas which utilized the same AM resources. As a final exercise, participants constructed a reflective essay describing the way they used the AM resources. The courses in which the participants produced their work involved a significant emphasis on digital historical resources, including instruction in the historical methodology and the instructional use of historical resources. All of the participants had an undergraduate

degree in history or a related socials studies subject area. The distribution of male and female students was even (46% women, 54% men).

Findings

Initial findings are presented here as an opening heuristic for understanding how TPACK takes shape in a specific social studies setting. The findings were focused on strategies participants used (*technology*) for seeking American Memory resources (*content*), which they used for planning instruction (*pedagogy*). The emergent findings reflected strategies for locating pedagogically relevant historical primary sources and were not focused on the act of searching or the initial retrieval of information. The data (decisions and activities participants engaged as these processed American Memory resources toward some instructional ideas) were deliberately analyzed in the framework of TPACK and findings emerged as technical strategies for using AM materials that were embedded in content and pedagogy. The analysis of all data resulted in the development of a three-step process of engagement with AM resources that reflected the way that participants located and used subject specific historical resources for constructing instructional ideas. These engagements are nested within each other with the first strategy determining whether a specific resource would be subjected to the second and third strategies. What follows is an overview of these engagements given broadly stated themes from the data.

First Engagement: Establishing a Context

The first strategy participants used was to engage resources in order to develop a context for using a given resource. These contexts were built from curricular and secondary source-derived subject matter knowledge. Participants differed significantly

with regard to their depth of knowledge (or their prior knowledge) and thus possessed varied abilities to contextualize resources. Contextualization, as described by Wineburg (1991), involves understanding historical events in temporal and spatial contexts. Historians understand historical events as "situate[d] events in concrete spaces" (Wineburg, 1991, p. 80). As participants engaged the American Memory collections they encountered historical resources that were for the most part de-contextualized. Effective use of these AM resources required that participants understood the value of a given resource from a historical or historiographical perspective. This situated knowledge informed the decision-making processes in which participants engaged with regard to whether they planned to use the resource in their instructional planning. If participants were able to successfully construct a context for engaging the resource, a second strategy emerged relating to how the resource might be used.

Second Engagement: Delimiting Resources

The second strategy employed by participants involved the personal delimitation of specific resources given its empirical characteristics. Delimitation involved a vetting, after a resource was located and contextualized, to determine the resource's value given participant-sensitive characteristics such as length, reproductive quality, complexity, relevance, and consistent accessibility. When delimiting resources, participants were making decisions about whether they were able to use the resource in their own learning. The delimiting process resulted in the acceptance or rejection of specific resources. For example, if participants thought they did not have enough time to read a resource or if they thought the resource was poorly organized, they were very likely to stop any serious engagement with it. Participants used descriptive text and organizational information

which framed the presentation of resources within American Memory collections as a source for making their delimitations. All of the American Memory collections include document lists and in most cases narratives about the collection and even summaries of individual resources. Participants, in part, used this information to make their decisions about whether to engage the resource. A decision to use the resource meant that participants would engage the resource at an even deeper level resulting in a third strategy for finding and using the resources.

Third Engagement: Pedagogical Elaboration

The third strategy involved the pedagogical elaboration of the resource. In this process, pre-service teacher participants began to think about how the resource might be adapted and tailored for specific student use. This process drew on participants' pre-existing and developing expectations about the learners for whom they were preparing the lesson. When elaborating the resources, participants were beginning to think about how the lesson would take form given their expectations for the amount of time they might spend on the lesson, the subject matter curriculum restraints on the topic, and their general ideas about student access to the resources. All of these considerations relate to what Shulman (1986) has described as a process of pedagogical reasoning. The elaboration process began when participants pedagogically engaged the resources. This engagement related directly to whether the participants planned to actually use the resources in their instructional plan.

Conclusion

Each of the three processes described above (contextualizing, delimiting, and elaborating) involve participant pre-service teachers finding and deciding to use digital

(online) historical source material in an instructional setting. These three processes were nested within one another and were mostly sequentially dependent. If a participant did not have the prior content knowledge or was otherwise unable to develop a contextualized understanding of a particular resource which they encountered, they typically would stop any serious engagement with the resource. If the participants' were able to continue their engagement, they began a two step process of determining the personal costs associated with using the resource (delimiting) and determining the pedagogical worth of the resource (elaborating). The delimiting process emerged as participants considered limitations associated with their own prior knowledge, their ability to contextualize the resource, and the general technological quality of the resource. If the resource was considered generally unusable due to length, text vernacular, quality of the reproduction, or any other technical limitation, participants were likely to disregard it. These delimiting actions were linked to the participants' abilities or inabilities to engage the resources. If the participants' felt comfortable enough with the resource to continue, they began to consider its pedagogical characteristics, subjecting the resource to various learner-centered elaborations.

The preliminary findings presented in this paper challenge the artificial divisions sometimes established between subject matter and pedagogy as well as between technology and subject matter. In this small study, subject matter and pedagogy were found to be dependent on one another as were subject matter and the technological affordances of American Memory (i.e., access to resources and the presentation of these resources). These findings may enable teachers and teacher educators to more effectively find and utilize primary historical resources on the Web for facilitating K-12 student

learning. In a sense, the findings present TPACK as an active dynamic body of knowledge that emerges in authentic and meaningful contexts. Additional deeper descriptions of TPACK in practice will aid in the continued development of our knowledge about how technology can promote meaningful democratic social studies.

References

Aideen J., Stronge, W. A. Rogers, & Fisk, A. D. (2006). Web-based information search and retrieval: Effects of strategy use and age on search success. *Human factors, 48*(3), 434-446.

Catledge, L. D. & Pitkow, J. E. (1995). Characterizing browsing strategies in the World Wide Web. Retrieved Online July 20, 2006 from http://www.igd.fhg.de/www/www95/papers/80/userpatterns/UserPatterns.Paper4.formatted.html

Center for Media Literacy. (2002). *CML MediaLit™ Kit - A Framework for Learning & Teaching in a Media Age*. Retrieved online July 20, 2006 from http://www.medialit.org/bp_mlk.html

Counts, E. L. (2004). The technology of digital media: Helping students to examine the unexamined. *Educational Technology 44*(5), 59-61.

Delgadillo, R. & Lynch, B. P. (1999). Future historians: Their quest for information. College and research libraries 60(3), 245 -259.

Dewey, J. (1927). *The public and its problems*. Shallow Press: Athens, OH.

Ellis, D. (1989) A behavioural approach to information retrieval system design, *Journal of Documentation*, 45(3), 171-212.

Fescemyer, K. (2000). Information-seeking behavior of undergraduate geography students. *Research Strategies 17*(4), 307-17.

Fleischhauer, C. (1996). Digital historical collections: Types, elements, and construction. Retrieved Online July 27, 2006 from http://memory.loc.gov/ammem/elements.html

Glasser, B. G. & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine.

Hölscher, C., & Strube, G. (2000/6). Web search behavior of internet experts and newbies. *Computer Networks, 33*(1-6), 337-346.

Kelly, M. (2008). Bridging digital and cultural divides: TPCK for equity of access to technology. AACTE Committee on Innovation and Technology (Ed.), *The handbook of technological pedagogical content knowledge (TPCK) for educators* (pp. 31-58). Mahwah, NJ: Lawrence Erlbaum Associates.

Koehler, M. J., & Mishra, P. (2008). Introducing TPCK. AACTE Committee on Innovation and Technology (Ed.), *The handbook of technological pedagogical content knowledge (TPCK) for educators* (pp. 3-29). Mahwah, NJ: Lawrence Erlbaum Associates.

Kuiper, E., Volman, M., & Terwel, J. (2005). The web as an information resource in k-12 education: Strategies for supporting students in searching and processing information. *Review of Educational Research, 75*(3), 285-328.

Lee, J. K. (2008). Toward democracy: Social studies and TPCK. AACTE Committee on Innovation and Technology (Ed.), *The handbook of technological pedagogical content knowledge (tpck) for educators* (pp. 129-144.). Mahwah, NJ: Lawrence Erlbaum Associates.

Levin, D., Arafeh, S., Lenhart, A., & Rainie, L. (2002). The digital disconnect: The widening gap between Internet-savvy students and their schools. New York: Pew Internet & American Life Project.

Lyman, P. & Varian, H. L. (2003). How much information. Retrieved February 8, 2006 from http://www.sims.berkeley.edu/how-much-info-2003.

McClintock, R. (2001). Experience and innovation: reflections on emerging practice with new media in education. *Journal of Educational Computing Research, 25*(1), 95-104.

Milson, A. J. (2002) The Internet and inquiry learning: Integrating medium and method in a sixth grade social studies classroom. *Theory and Research in Social Education 30*(3), 330-353.(Hölscher & Strube, 2000/6)

Nahl, D., & Harada, V. (2004). Composing Boolean search statements: Self-confidence, concept analysis, search logic and errors. In M. K. Chelton & C. Cool (Eds.), *Youth information-seeking behavior: Theories, models and behavior* (pp. 119-144). Lanham, Maryland: Scarecrow Press.

Shulman L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4-14.

Stearns, P. (2008). Why study history. Retrieved March 01, 2008 from the *American Historical Association* at http://www.historians.org/pubs/Free/WhyStudyHistory.htm

Stronge, A. J. Rogers, W. A. & Fisk, A. D. (2006). Web-based information search and retrieval: Effects of strategy use and age on search success. *Human factors, 48*(3), 434-446.

Wilson, T. D. (1999) Models in information behaviour research, *Journal of Documentation*, 55(3), 249-270.

Wineburg, S. S. (1991). Historical problem solving: A study of the cognitive processes used in the evaluation of documentary and pictorial evidence. *Journal of Educational Psychology 83*(1), 73-87.

[1] "The Deep Web: Surfacing Hidden Value," *BrightPlanet LLC*, available at http://brightplanet.com/technology/deepweb.asp (18, Oct 2005)