A Pathway to Practice: Applying Findings from a Study of Preservice Teachers' Digital Literacy

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Abstract

According to the National Council of Teachers of English [NCTE] (2008) "proficiency with the tools of technology" and the ability to "create, critique analyze and evaluate multi-media texts" are among the key characteristics of 21st century literacies (p.1). Using a case study design, researchers explored the digital literacy demonstrated by fifty preservice teachers engaged in problem-based learning. The study examined the interaction and collaboration between and among fifty preservice teachers in methods classes as they created wikis as tools for identifying solutions to content-bound, open-ended problems in social studies and science. Data included interviews conducted with participants at the beginning and conclusion of the wiki project and activities documented in wiki page histories such as adding, editing, questioning and deleting information. Findings indicated that preservice teachers were facile with the skills needed for using wikis as meaning making tools and that they recognized the potential of wikis as tools for meaning making; however, they were unable to use wikis as tools for deep engagement in the process of knowledge construction. Students engaged in fact finding, but they did not engage in analyzing, evaluating or critiquing information. The students' wikis presented no evidence of critical thinking or evaluation of sources. Based on the findings of this case study investigation, this paper presentation identifies and describes essential components for designing teacher education and professional development programs, courses and assignments that will enable learners to use ICTs as tools for critical thinking. Specifically, it discusses the development of instructional goals, objectives and activities that truly necessitate the use of ICTs as meaning making tools, the types of facilitation, scaffolding and modeling that foster critical thinking when using ICTs and ways to provide multiple opportunities to use ICTs in academic settings.

1. The issue

According to the Pew Research Center (2010), Americans between the ages of 18 and 29 are using technology in nearly every facet of their lives. In fact, 75% of those surveyed have a profile on a social networking site (p.29) and approximately 55% visit that site at least once daily (p.28). Cell phone use for talking, texting and connecting was reported by 94% of respondents and 83% reported sleeping with their mobile device nearby (p.32). This group is "more networked and globally engaged than members of any similar age cohort in American history" (Zogby, 2008, p.94). They are the Millennials (Pew Research Center, 2010), the First Globals (Zogby, 2008). They are the next generation of teachers. They are the future of education.

Born between 1980 and 2000, this group makes up the majority of students currently enrolled in teacher education programs in the United States. While they may be more likely to text, tweet and friend than the Baby Boomers and Generation Xers who teach them, our research on digital literacy (Margolin, Fragnoli & Flihan, 2010) and related research describing the use of wikis among undergraduates (Cole, 2009; Lundin, 2008; Morgan & Smith, 2008; Wheeler, Yeomans & Wheeler, 2008) and K-12 teachers and students (Engstrom & Jewett, 2005) shows that they are not always eager or fully able to use real life technologies for acquiring and constructing knowledge in academic settings.

2. The study

Using a case study design, we explored the digital literacy of preservice teachers who participated in wiki construction. Participants included twenty-seven graduates enrolled in a required, integrated social studies and English methods course and twenty-three undergraduates enrolled in a required, integrated science and math methods course. Students in each course were randomly assigned to groups of five to seven students. All students were assigned to a group; however, only thirty-six students actively participated. Within each class students used wikis for identifying solutions to the same content-bound, open-ended problem. Data included interviews conducted with participants and activities documented in wiki page histories. Data analyses occurred at two levels. First, all actions within the wiki were identified and tallied. Second, the content of each action was analyzed to create a coding scheme reflecting literacy skills associated with constructing wikis such as initiating, revising, extending and editing ideas either independently or collaboratively.

3.The findings

Findings indicated that preservice teachers were proficientwith the technical skills needed for constructing wikis and recognized the potential of wikis as tools for meaning making. They were not able to use wikis as tools for knowledge construction. Students could, for example, search for and identify relevant information, but they did not critique or synthesize that information. They were able to initiate posts by uploading information and creating hyperlinks, but they did not revise or extend the information in their posts or those of others.

4. Implications for the future

While there is little doubt that the Millennials who will lead us in the future of education are technically proficient with the digital tools required for developing and demonstrating 21st century literacies (NCTE, 2008), these findings indicate that Millennials are not yet demonstrating the ability to use them as tools for literacy to “create, critique analyze and evaluate multi-media texts” (NCTE 2008, p.1). Based on the findings of this case study and the newly developing body of literature that supports them, it is clear that we must chart a path for integrating digital tools into teacher education and professional development programs in ways that will enable learners to use digital tools for engaging in the meaning making and critical thinking processes necessary in the 21st century. Prior to embarking on this pathway to practice, we urge educators to ponder four guiding questions that are essential for developing experiences that foster future educators’ successful knowledge creation through technological tools.

4.1 Why use technology?

Wikis, blogs, Garage Band and Comic Life are just a few examples of the digital tools that learners are using in their lives outside of school. As these tools are appropriated for educational purposes, we must examine our motivation for using technology in classroom contexts and establish the goals and objectives we hope to achieve through technology. Upon completion of our own study, we reflected on our students’ tendency to focus on the quantity of information they contributed to the product rather than the quality of information or the collaborative process of problem solving. We grappled with whether or not our assignment objectives were clear. We wondered if wikis were the best choice for achieving the objectives related to problem solving. Similarly, participants in Cole’s study (2009) reported feeling that wikis were not relevant or necessary to the course or to their learning. These findings indicate that digital tools should not be used simply because they are trendy, convenient or simply available. Educators should utilize technology when they can integrate it with content and pedagogy in ways that are meaningful and essential for achieving student learning goals and objectives (Harris & Hoefer, 2009; International Society for Technology Education [ISTE], 2008; Mishra & Koehler, 2006).

4.2 What support is necessary?

Several studies indicated that learners experienced difficulty using the technical skills required to construct a wiki such as creating hyperlinks, browsing and uploading (Cole, 2009; Engstrom & Jewett, 2005). Others noted that wiki users also experienced difficulty due to uncertainty about the expectations of the assignment (Wheeler, Yeomans & Wheeler, 2008). While participants in our study expressed no confusion over the assignment and demonstrated the technical skills required to construct a wiki, their ability to utilize these skills for meaning making was in its nascent stage. In initial interviews, students understood digital literacy as synonymous with digital tools such as computers and search engines. They needed support to engage in thinking processes associated with knowledge construction. While students never engaged fully in these processes, final interviews demonstrated a shift in their thinking about being digitally literate. After the assignment was completed, they talked about the importance of "creating information" and described it "a process" that required more than being "technologically savvy."

These studies serve as a caution against believing "the myth of the 'digital native'" (Mindlin, 2010, p.12) and assuming that students who have grown up using technology will be able to use it for school purposes. We must remember that learners may not be encountering a particular tool for the first time, but they may be encountering that tool for the first time in the classroom. Educators must support the refinement of learners' technical digital skills as well as the development of their critical thinking skills by providing scaffolding and modeling that promote analysis, evaluation and synthesis which are hallmarks of literacy and necessary for the construction of new knowledge (ISTE, 2008; Jenkins et al., 2009; Mindlin, 2010).

4.3 Can we create new knowledge?

ISTE standards call for teachers to use their knowledge of technology, content and pedagogy to promote and support student "learning, creativity and innovation in both face-to face and virtual environments" (2008, p.1). In short, teachers are asked to promote the construction of new knowledge. Researchers such as Cole (2009), Engstrom & Jewett (2005), Lundin (2008), Morgan & Smith (2008) and Wheeler, Yeomans & Wheeler (2008) described wikis as inquiry tools that can promote student-centered knowledge acquisition and construction through the seeking, sharing and revising of ideas. While this may be true, their examination of wikis and ours shows that this does not always happen. Students in our study engaged in fact finding. Their wikis presented no evidence of new knowledge.

If learners are to construct new knowledge, assignments and projects utilizing technology to achieve curricular and instructional goals must convey the creation of new knowledge as a necessary and explicit outcome. Directing learners to use digital tools such as wikis to describe, explain or identify is not likely to move them beyond the solitary act of fact finding. Instructing learners to debate, hypothesize and discuss will promote interaction and collaboration as they question and synthesize facts in order to construct new knowledge.

4.4 How will we establish community?

Interacting and collaborating while using digital tools is essential for the knowledge construction process (ISTE 2008; Jenkins et al., 2009). Many describe wikis as collaborative (Cole, 2009; Engstrom & Jewett, 2005; Lundin, 2008; Morgan & Smith, 2008; Wheeler, Yeomans & Wheeler, 2008); however, the lack of interaction and collaboration between and among our preservice teachers during wiki construction was striking. Our students initiated 224 individual posts consisting of newly acquired information from digital sources, but only extended 69 existing posts created by classmates. Theses extensions occurred without comment and consisted of the addition of information rather than the revision of ideas. Similarly, Cole (2009) reported low participation among students in her study. Participants cited unwillingness to share and critique ideas and lack of confidence in their work as reasons (p. 144).

Educators should encourage students to engage freely in the collaborative process by creating discourse communities in the digital world just as they do when meeting students in person. The atmosphere must be facilitated, collegial and cooperative. Ideas of teachers and students must be welcomed, equally valued and respectfully challenged so that they can be refined and extended. Feedback in the form of probing questions and critique must be frequent and consistent.

5. Finding answers

The identification of clear curricular and instructional goals and objectives, the provision of instructional scaffolding and modeling, the creation of new ways of knowing and the establishment of a supportive community of learners are important aspects of effective learning contexts. Therefore, the four questions we pose to teacher education and professional development programs are questions all educators should consider before embarking on any pathway to practice whether or not it includes technology. Our study and the work of those cited here indicate that when we ask learners to appropriate their everyday digital tools for school purposes, we must ensure that technology is promoting and enhancing these aspects of effective contexts rather than displacing or replacing them.

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