

JOURNAL OF LITERACY AND TECHNOLOGY
VOLUME 10, NUMBER 1: APRIL 2009

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Integrating Technology in One Literacy Course: Lessons Learned

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Teacher education has been subject to both criticism and innumerable efforts designed to reform it and to make it more relevant to teaching and learning in the diverse societies of the 21st century. A much sought after reform includes evidence of programs that utilize a more tightly holistic and integrated approach to instruction (Boyer, 1990) aimed at equipping teacher candidates with skills to teach in the information age of multiple technological literacies (Leu, Kinzer, Coiro, & Cammack, 2004). Rapid digitization of everyday practices means that we need to rethink conventional epistemology that essentially favors propositional and text-book knowledge. While today's children, otherwise known as the "digitally at home kids" (Lankshear & Knobel, 2006) or the millennials, live their lives with and through the aid of digital technologies, schools have generally remained largely print-based and lukewarm in integrating these technologies. In order to motivate these children and make learning more meaningful for them, it is imperative that teachers balance academic literacies with technological literacies (Author, 2006, 2009).

In this respect, public schools, and preservice teachers, are in danger of becoming increasingly irrelevant if they do not become technologically savvy practitioners, both helping students become technologically literate and continuously utilizing technology as an instructive tool (National Education Technology Plan, 2004). To meet the demands of teaching children in an information age, preservice and in-service teachers must acquire the 21st century skills such as participatory culture, distributed expertise, collective intelligence, sharing, experimentation, innovation and evolution (Jenkins, Clinton, Purushotma, Robinson & Weigel, 2003; Lankshear & Knobel, 2006, Partnership for the 21st Century Skills, 2004). Teacher preparatory programs therefore face increasing

challenge of providing models of authentic teaching and helping teachers develop their knowledge of the content, discourse, and content specific pedagogy which includes skills in technology use and application (Kinzer, Cammack, Labbo, Teale, & Sanny, 2006). However, reports indicate that in general, teacher preparation programs do not provide future teachers with the kinds of experiences necessary to prepare them to use technology effectively in their classrooms (AACTE Committee on Innovation & Technology, 2008; Kinzer et al., 2006). Effective preparation of teacher candidates requires significant change by teacher educators not only in their individual practices but also in their understanding of how technology can be used for legitimate purposes (Otero, Peressini, Meymaris, & Ford, 2005).

As observed by Posner (2005), experience combined with reflection results in professional growth. This paper focuses on my experiences and reflections in terms of my technology integration efforts as a teacher educator and lessons I learned from it. By reflecting on and sharing my own experiences, I hope that other educators and teachers will be informed about issues in technology integration in teacher education. The study is guided by the following research questions: What does one teacher educator's experience reveal about integrating technology in teacher education? What lessons or insights do these experiences provide teacher educators and other stakeholders in education?

Theoretical Framework

I draw from Rogoff's (1994) assertion that learning occurs as a result of "transformation of participation" in culturally valued activities and "how people develop is a function of their transforming roles and understanding in the activities in which they

participate” (p. 209). Through participation in culturally relevant activities, individuals appropriate new ideas, attitudes, skills and practices or transform and reconceptualize the old. According to Freire (1972), everyday human activity “consist of actions and reflection: it is praxis; it is transformation of the world” (p. 96). As we use tools and language to shape action, tool use changes us, even as we change the tools (Rogoff, 2003). Through integrating technology in one graduate literacy course, observing novice teachers and reflecting on my actions, I worked to transform my knowledge, skills and pedagogy as well as my students’ competencies in using technology for instruction.

Transformations involve, among other things, interrogating one’s beliefs and actions. Prior studies indicate that teachers’ pedagogical beliefs and knowledge (Abbott & Faris, 2000; Niess, 2005, 2008; Otero et al., 2005; Russell, Bebell, O’Dwyer, & O’Connor, 2003; Stolle, 2007) are important factors in their quest for technology integration. In addition, teacher educators trying to integrate technology need to develop a critical disposition toward technology (Otero et al., 2000). This implies that teacher educators should be able to develop an understanding of why, when and how to use technology for learning and the ability to model and deliver technology-infused curricula, pedagogy and assessment (Larson & Marsh, 2005). They need to help teacher candidates develop technological pedagogical content knowledge (TPCK) (Mishra & Koehler, 2006; Niess, 2005, 2008). TPCK involves “development of subject matter with the development of technology and of the knowledge of teaching and learning” (Mishra & Koehler, 2006, p.18). This framework posits that stand alone technology courses and workshops are not enough to improve teachers’ technology integration knowledge and skills. Instead, educators should utilize an integrated approach that fuses technology,

pedagogy and content. TPACK recognizes that the integration of technology should not be done in a generic sense but should be situated within authentic contexts to enable prospective teachers learn content specific ways to use technology.

It is equally important for teacher educators to be familiar with models or phases of technology implementation (LoTi) (Moersch, 1995) to help them critically assess their knowledge and competence with technology as well as how to use technology to achieve more meaningful change. Moersh (1995) identifies six levels of technology implementation (LoTi), which include awareness, exploration, infusion, integration, expansion and refinement. Barab, Squire & Dueber (2000) propose a co-evolutionary model which supports collaboration among the learner participants (preservice teachers) and the real world practitioners or in-service teachers so that they can better relate their practice to classroom context. Hooper & Rieber (1995) argue for a model that consists of five phases: familiarization, utilization, integration, reorientation and evolution. The familiarization stage is when the teacher learns to use the technology. During the utilization stage, the teacher uses technology but may have little understanding of, or commitment to, the technology as a pedagogical and learning tool. Integration occurs when technology becomes an integral part of the course in terms of delivery, learning, management, or other aspects of the class. The reorientation stage involves teachers using technology purposefully to rethink course goals, methods, structures and learning environment while the evolution stage involves teachers who continually modify the classroom structure and pedagogy to include evolving learning theories, technologies and lessons learned from experience. Teacher educators trying to integrate technology may experience obstacles. Butler and Sellbom (2002) identify the following barriers to faculty

adoption of technology. These include: (a) reliability of technology, (b) time to learn the new technology, (c) knowing how to use the technology, (d) concern that technology might not be critical to learning and (e) perception of inadequate institutional support. In this paper, I argue that effective technology integration in teacher education can be achieved when teacher educators are committed to technology-rich pedagogy and as teacher candidates are immersed in authentic activities with various technologies within classroom context.

Methods

Transcripts from this fourteen-month study were collected from a graduate-level course in literacy at a liberal arts college in the Northeastern United States. Most students enrolled in this course were already practicing teachers often with one or two years of experience in the classroom, while some were long term or per diem substitutes. A few were full time students and worked in jobs outside of education. Participants were 65 pre-service and in-service teachers made up of four cohorts of candidates who took the course in the summer and fall of 2007, as well as the spring and summer (May/June) of 2008. Fifty-seven percent (n=37) were pre-service teachers while 43% (n=28) were in-service teachers. Ninety eight percent of the students were European Americans, while 2% were African Americans. All but two candidates were females.

Instructional context

Technology integration occurred in the context of a graduate literacy course which was primarily about literacy acquisition. This required introductory course was also a prerequisite for the majority of the other courses in the program. It covered such topics as the sociocultural theory, new literacies, cultural and linguistic variation, the reading process and historical perspectives of reading research. Course expectations included weekly reflections, group research projects and completion of two major writing assignments which consisted of long essays. Initially, technology was not integrated into this course save for one or two articles on new literacies and technologies. However, changes were implemented to accommodate the integration of new technologies. This happened incrementally in that initial attempts were evaluated which necessitated subsequent changes and diversification of projects and activities. Teacher candidates were exposed to various technological tools during the course which required them to work either individually, in pairs, or in groups to research and teach lessons that demonstrate the use of particular technologies for instruction. Students participated in different technology projects which included teaching with the Interactive White Board (IWB), or smart board as it is often called, constructing/maintaining personal blogs and group wikis, and an open ended project in which they chose from a variety of options or designed their own projects to suit their particular interests or classrooms. In-service teachers were encouraged to design projects that aligned with their classroom needs which they could immediately use with their students. For each technology project, the students wrote reflections which included affordances or constraints of using that particular technological tool for instruction and suggestions for improvement.

I approached the study using self-study as a methodological tool. Self study is a necessary pedagogical/researcher stance that can improve teaching and learning in teacher education learning contexts (Dinkleman, 2003; Hamilton, 1998; Loughram & Russell, 2002; Russell, 2002). Quality self-study is a disciplined and systematic inquiry that values professional learning and aims to develop and better articulate knowledge of practices that promote self-criticism and self-awareness of our work as teachers (Loughram, 2007). It is a recursive process of doing, thinking about what was done, making adjustments and doing again (Clark, Erickson, Collins, & Phelan, 2005).

LaBoskey (2004) lists some methodological features of self-study that include the:

- Requirement of evidence of reframing and transformation of practice.
- Need for interactions with colleagues, students, educational literature (and the researcher's previous work) to continually question developing understandings in order to 'interrogate assumptions and values.'
- Competent use of multiple methods to provide "opportunities to gain different and thus more comprehensive perspectives on the educational processes under investigation (p. 860).

Self-study aligns with the scholarship of teaching and learning (SoTL). According to Shulman (2000), "[w]e develop the scholarship of teaching when our work as teachers becomes public, peer reviewed, critiqued and exchanged with other members of the professional communities so they, in turn can build on it" (p.50). Boyer (1990), an early advocate of SoTL, had argued that scholars must build bridges between theory and practice through scholarship and communicate their knowledge effectively to students. In recent years, there seems to be a consensus that SoTL is the development of teacher

knowledge (Kreber, 2005; Meyers, 2008) which “should be informed by the knowledge of the field, be inquiry driven and involve critical reflectivity” (Kreber, 2005, p. 328). I engaged in SoTL as I systematically documented my teaching experiences, professional growth and students’ learning.

Data sources: Major data sources included course syllabi for the four semesters, students’ reflections, surveys, focus group interviews, online discussions, and my reflective journal in which I analyzed my sense making of the teaching and learning process. There were two surveys: the pre-study survey was used to collect demographic information and to assess students’ initial knowledge of literacy and technology, while the post-study survey assessed students’ perceptions and knowledge gained from the course. The post-study survey was a twelve-item questionnaire that had a mix of likert-type, essay, and short answer questions. All participants took the surveys. This instrument enabled me to capture students’ evaluation of course activities and their emergent practical theories about literacy and technology. In addition, I conducted one focus-group interview for each cohort. The focus group interview allowed me to interact directly with participants, allowing for clarification of points and probing for further information. Through the interviews, I sought information about students’ opinions on the technologies they used and their perception of the course. In addition, students’ artifacts such as transcripts from individual blogs and group wikis, technology presentations and reflective papers were also used for analysis.

Data analysis

Data was analyzed using both self-study and grounded theory approaches. Analysis through self study involved looking inwards to question, reexamine or validate my teaching in view of students' learning and feedback. Using my reflective journal, I documented instances of perceived changes both in my pedagogy and students' learning.

Grounded theory (Glaser & Strauss, 1967) is a way to generate theory from data through inductive and constant comparative analysis. Contextual nuances are used to generate theory through participants' lived experiences. Data analysis of students' artifacts was recursive and occurred in stages, during which open, axial and selective coding techniques were employed. I approached the analysis through some guiding questions to help me focus on data interpretation. These questions were; how has my pedagogy changed or evolved as a result of integrating new technologies? Were teacher candidates provided with authentic technology-using experiences? What additional changes need to be made? What evidence demonstrates students' satisfaction with their technology-using experiences? Which activities were particularly motivating? Did the candidates demonstrate an integrated knowledge of literacy, technology and pedagogy? Did they make connection between literacy, technology and everyday practice?

Data analysis was recursive and occurred in phases. At the end of the each semester, I analyzed the data and used the result to refine my research methods, course objectives and activities. I usually started the analysis with open coding, which is the process of breaking down, examining and conceptualizing data. During this initial analysis, I immersed myself in the data, reading and rereading all data to get a general impression of the teachers' thought processes, perspectives and challenges. I generated marginal notes

for main ideas and important details. Coding schemes were developed through an iterative process of individual coding, and re-checking against the data. Codes were also generated from the research literature. I developed three coding schemes for students: course experiences, connections and integrated knowledge. These were later expanded to represent broad categories. The course experience category was divided into a sub-category that included negative and positive experiences. I documented all instances of students' expressed experiences of using technology in the course and how it impacted their learning. In the connections category, I pulled together instances where students made connections between literacy and technology or when they linked technology-use to literacy theories, students' backgrounds and classroom practice. For the integrated knowledge category, I coded instances where the candidates creatively used some technological tools to enhance the teaching of particular literacy skills. For example, I coded for creative smart board lessons, virtual books, WebQuests, videos, podcasts, among others. A separate category; actions/changes, was created for the instructor.

Categories were continuously refined as new information emerged. Axial coding was employed as I explored these categories for conditions that influenced the learning context. For example, initial data from the first semester of the study indicated that students were not satisfied with their technology experiences. Based on this knowledge, I refined the technology projects and included more hands-on activities that involve both individual research and collaboration with peers. Each semester, I followed the same process and compared both the categories and the themes from previous semesters using a constant comparison approach (Bogdan & Biklen, 1998). I also reflected on the information I collected from students such as prior knowledge about technology, growth

in technology knowledge, factors that influenced their learning with new technologies and suggestions for effective technology integration. During selective coding, attention was paid to key words used by students as they described their technology learning and teaching experiences such as *comfortable, confident, useful, useless, motivating, prepared, confused and clarified*, among others, noting contexts where they were used and activities they related to. At the end of the fourth semester, I compared and examined all data for consistency or discrepancy, and then synthesized all emerging themes. Validity of the study was facilitated through prolonged involvement with participants and triangulation of data sources. In addition, member checks were used to ensure that the participants' views were adequately represented. These measures ensured trustworthiness or reliability of the study because the major themes were consistent across the four semesters of the study.

Results

Results from this study indicated that the instructor's personal philosophy, the support system, understanding students' perspectives, modeling, and the development of a critical disposition enhanced the successful integration of technology in the course. These measures produced some learning gains. The major themes that emerged from students' data included (a) authenticity, (b) increased confidence, (c) participatory learning, and (d) learning connections.

Looking inwards: Examining my philosophy for technology in teacher education

The impact of a teacher's philosophical stance and beliefs about technology integration on actual technology use cannot be overemphasized (Ertmer, 2005). As a teacher educator, I believe that technology is very important in teacher education. New teachers should be trail blazers in using technology for teaching especially now that most children's home lives revolve around popular culture, media and new technologies. While many children are very adept at using technology for entertainment and social interaction, the literacy demands they encounter when using these same technologies for learning are different and necessitates that teachers are well equipped to thoughtfully guide students' use of technology for instruction. I also believe strongly that teacher education should be in the forefront of using state-of-the-art technologies so that teacher candidates are well prepared to integrate technology in their own classrooms. Ultimately, technology can be used to reconceptualize classroom learning in ways that can enhance instruction and mediate learning environment. My background in both literacy and technology impacted my perspectives and equipped me with the necessary background knowledge about technology integration. However, newer technologies have continuously emerged, rendering my prior knowledge outdated, but my resolve and interest in using various technologies remained unshaken. To successfully integrate technology in this graduate course, I was willing and did learn from my colleagues, experts, research literature and my students. The support system notwithstanding, my experiences suggest that effective technology integration is not a one shot linear process

but a recursive process that involve experimentation, thinking about and doing, learning from experience, refining and doing again.

Learning from initial integration effort

Prior to this study, I depended solely on the Blackboard for technology integration. The Blackboard was used to post all course readings, students' grades, assignments, and PowerPoint files. Group pages were set up with functionalities that included online discussions, e-mails, and file exchange. I realized however that while the use of the Blackboard represents technology integration of some sort, it has some disadvantages. First, students did not have access to the Blackboard once they graduated from the program. Secondly, many new technologies and online resources have continuously emerged, so depending only on the Blackboard will greatly limit students' technology experiences.

My initial expansion effort included the creation of a classroom blog for the purpose of online discussions. In addition, a technology project was added as part of the course assessment. This project required candidates to describe three major ways to use technological tools such as websites, blogs, wikis, literacy software, Swish, WebQuests among others. However, looking back at my initial approach, I realized that it was flawed, although it provided opportunity for learning and growth. There was an over reliance on the Blackboard and later a classroom blog. Hands-on activities were not emphasized, and students did not teach with these technologies but rather talked about them. Feedback from students' end-of-semester reflections revealed that most of them

did not feel prepared to integrate technology in their own classrooms. An excerpt from a student's interview buttressed this:

Personally, I don't feel as though the discussions on Blackboard or through the blog were worthwhile. It seems they were forced on us and I did not really feel invested in it and I didn't enjoy it as much. I also do not feel I am prepared to use them in my classroom because I don't know how they were set up. We don't have access to Blackboard in my school. I think the better approach is to teach us how to set up or maintain blogs and allow us to use it for our own purposes.

Another student had a different perspective of the technology integration:

I feel that this course has helped me become familiar with a wide variety of forms of technology that I did not know existed previously. I enjoyed the different uses of technology within this course. If possible, using technology more while in the classroom may help those of us who are visual or auditory learners. Just like students in elementary school, older students like us are often interested in technology and would be engaged more with those.

Notice the difference between these two perspectives. In the first reflection, the student made it clear that merely using a blog or Blackboard was not enough for her to feel confident to use technology in her classroom. The second student was happy that she was exposed to various technologies. However, there was no indication that she would feel comfortable using them in the future.

While my initial effort was flawed methodologically, feedback from students indicated that it did motivate them. It also promoted engagement with course content and

reduced the usual complaint of boredom hitherto expressed in the class. It was clear however that a hands-on, problem-based approach would better prepare candidates to use technology and equip them with the necessary skills and confidence needed to integrate technology in their own classrooms. At this point, I probably operated between the utilization and integration phases of technology utilization (Hooper & Riebert, 1995). Although technology was an integral part of the course in terms of delivery, management and learning, it was not used as an effective pedagogical and learning tool since the experience provided to students was inadequate in preparing them to teach with technology or instill confidence in them. This corroborates the findings of other researchers (Mishra & Koehler, 2006; Russell et al., 2003) that simply urging teachers to change their shaping belief or requiring them to infuse technology in classrooms will be fruitless unless we provide them with authentic contexts and numerous experiences to engage in thinking, practicing, teaching and reflecting with new technologies. One of such experiences was modeling good technology use in authentic context.

Modeling technology use

Teacher modeling in the use of technology has been cited as the single most important influence in subsequent technology use by students (Niess, 2005; Otero et al., 2005).

At different times in my technology integration effort, I modeled different uses of various technologies. Initially, modeling was very limited because I was still grappling with several issues including understanding how to use the technologies myself.

However, as I reflected on my teaching with new technologies, acquired new tools and learned to use them, modeling increased. As soon as my classroom was equipped with an

Interactive White Board, I integrated it fully into my teaching. I used it to model revision strategies, highlight articles for critique and to capture class discussion using graphic organizers. The board was also utilized for word sorts and to access the Internet quickly and more easily. The Blackboard was equally utilized. All course materials and grades, including the surveys, were posted on the Blackboard. Alongside the Blackboard, I created a personal wiki and uploaded some course materials to the wiki to demonstrate its use. At the beginning of each semester, I prepared a podcast “About me,” and played it for students. This set the stage for them to produce their own podcasts. Video cases and video clips from online resources such as the united streaming website, children and teacher websites or YouTube videos were integrated whenever appropriate. In addition, exemplary teachers who used technology were invited to the class to talk about and demonstrate what they did.

All focus group interviews and group discussions were recorded using my iPod. Group discussions were later played back for discourse analysis. In addition, the teacher candidates had the opportunity to observe an expert demonstrate how to use iPod for instruction. Prior to this time, most of the teacher candidates were not aware that iPod had other uses apart from music, but observing the instructor and another expert who demonstrated its instructional use, went a long way in changing the teachers’ beliefs about the educational value of this piece of technology. I engaged students in one-on-one conversations through their blogs. These conversations provided valuable information concerning each student’s learning and promoted better teacher-student relationship. Furthermore, journal articles or book chapters that provided good models of teachers’ use of technology were included as part of course readings. Over 90% of the participants

cited teacher modeling as important in their developing technology proficiency. This students' reflection mirrored the view of most participants:

I would definitely feel confident using an iPod in my classroom after taking this course. I had no idea that an iPod could be used for so many things! I enjoyed the technology presentation that day and saved all the materials that the speaker gave us, and I plan on playing around with my iPod and using it in my classroom. I think there is a stigma that using new technologies is difficult and complicated. However, with the demonstrations we have in class, these doubts have been alleviated.

There is no doubt that modeling the use of technologies had an impact on the way the teacher candidates perceived their usefulness. There were indications that modeling helped them overcome some fears associated with technology use in the classroom. However, modeling alone cannot guarantee that the candidates will effectively use technology or develop TPACK. Innovative activities and creative thinking were needed to move to the next stage. It was also important to understand the perspectives of the teachers on their learning.

Understanding students' perspectives

In order to continue to refine my pedagogy, I realized that students' voices were very crucial in any decisions concerning their learning. Therefore, students' perspectives about the course, the challenges they faced and suggestions for improvement were instrumental to most of the changes that I implemented. Each data source had a question that elicited

students' input about how they perceived the use of particular technologies and suggestions for improving classroom instruction.

Initially, many candidates complained about inadequate teacher modeling and hands-on experiences. With time, the concern centered on three major issues: course structure, course load, and access to various technologies outside the campus. 70% of the teacher candidates wanted some class time set aside for hands-on activities. They indicated that finding time to meet with their partners and groups was very challenging, given that some of them had full time jobs and even families. About 80% of the students felt that the workload for the class was heavier than usual because of all the technology projects, coupled with the research and academic papers required in the course. Another challenge that students identified was access to various technological resources outside the campus. As much as 80% of the in-service teachers had no access to the smart board, podcasting software and other tools in their classrooms.

All the candidates (100%) wanted to see consistency in technology integration in their future teacher education courses. Specifically, they were worried that other courses may not integrate technology which might hinder their ability to consolidate what they have learned. They wanted all courses in the program to provide them with similar technology experience so that they can reinforce the knowledge gained in the course.

Developing a critical disposition

Critically reflecting on my initial integration effort and students' concerns made me raise a number of questions, such as: How can technology enhance the pedagogical goals of this course? How can I help my teacher candidates develop technological pedagogical

content knowledge (TPCK)? How can technology be used to promote critical thinking, problem solving and classroom discourse? What course readings might provide good theoretical knowledge about the relationship between literacy and technology as well as models of good practice in technology integration? These questions made me reexamine and rearticulate the course objectives and consequently revised them, addressing the technology dimension of the course. The course syllabus was again revised and updated with additional readings on literacy/technology connections. The previous technology projects were removed, and three new ones were created. These included (a) Interactive White Board (IWB) project in which students taught minilessons using the smart board, (b) the wiki project which required a group of four to five students to set up a wiki and use it for weekly discussions and e-portfolios, (c) an open-ended technology project in which candidates worked in pairs to investigate, design and teach a lesson using a particular technology and (d) a personal blog used for online journaling and written conversation between the students and instructor. Each student also prepared and uploaded a podcast titled “About me” to their blogs.

For each technology project, candidates were required to write a critical reflection to document their experiences with learning and teaching with that particular technology. These actions produced some results. Learning became more authentic and students expressed confidence in their ability to use various technologies. In addition, participatory learning increased and students made better connections between literacy, technology and learning.

Authentic learning

Authenticity was enhanced through blogging, wiki, group and whole class discussions as well as class presentations on various forms of technologies. In their reflection, almost all the teacher candidates (95%) indicated that having a real audience for their technology projects and a real purpose for doing it motivated them to work hard to learn about various technologies. This was echoed by one candidate when she indicated that “it was great to have a smart board presentation because that motivated me to actually play with and use the smart board first hand.” As this candidate observed, it appeared that requiring students to teach mini lessons that incorporated different technologies helped them situate technology use in authentic context. Having an authentic audience online also facilitated better writing. One candidate reflected on her writing online. “Because I participated in our wiki discussions, I revised and edited my written responses properly so that when others read it, it would make complete sense.” Others expressed support for online discussions because they were able to “read other classmates’ ideas about course materials.” In addition, a co-evolutionary model (Barab, Squire & Dueber, 2000) was promoted as some in-service teachers partnered with pre-service teachers to design specific projects for their classroom needs. Engaging in various authentic activities may have boosted the self-efficacy and confidence of the teachers.

Self efficacy/confidence in using technology

As the teacher candidates engaged in a variety of projects, they expressed confidence in using various technologies in their classrooms. During the focus group interviews, I asked the candidates to say which technological tools they would feel comfortable using

in their classrooms as a result of their course experiences. An excerpt from this student's response represented the view of most of the candidates:

I believe I would feel comfortable using many of the technological tools I was introduced to. However, the ones that I got hands-on experience with would probably be the ones I feel most comfortable using. The smart board would definitely be at the top of the list since it is something we worked with all semester. However, I also feel extremely at ease using blogs, wiki, podcast, and the wonderful website, nicenet.org. This class definitely taught me the importance and benefits to modern day technology. It taught me about the relationship between literacy and technology. The knowledge and experience I now have about technology provides support for wanting to use various technologies for teaching and my comfort level with maneuvering them.

It appeared that the teacher candidates felt well prepared to teach with technology when they were exposed to various technologies online and offline and given the opportunity to design, practice, teach and reflect on their technology-using experiences. In doing so, they learned collaborative and participatory skills.

Participatory learning

According to Jenkins, Clinton, Purushotma, Robinson, & Weigel (2006) participatory culture shifts the focus of literacy from one of individual expression to community involvement through active participation, creative expression, informal mentorship and collaborative problem-solving. Participatory culture promotes distributive expertise in which members benefit from their more knowledgeable peers. As the teacher

candidates worked collaboratively in pairs and groups to research, design and present their projects, they were involved in problem solving and peer mentoring. In their reflections, 95% of the teacher candidates attributed their success in acquiring proficiency with different technologies to their peers or group members. These views were captured by one of the teacher candidates when she explained how she acquired proficiency with some technological tools:

One thing I enjoyed in this class was working with my partner and group in many of our projects. Technologically, I was a novice but I was lucky to work with someone who was very savvy. My partner and I created a virtual book and designed a WebQuest from scratch. She put me through some of the things I needed to learn for our presentations and helped our group set up our wiki. Later, our group members took turns to maintain our wiki. I modified the front page, uploaded our weekly summaries, maintained my personal page and uploaded my podcast. Gradually, I started to work effortlessly with various technologies.

Although some groups did not have tech savvy members, they were able to jointly explore and negotiate meaning through collective intelligence and sharing of ideas. It appears then that success with various technologies depended to a large extent on distributive knowledge, experimenting with new technologies as well as observing models in authentic context. These experiences helped the candidates to make connections between technology, learning and students' background.

Making connections:

A combination of course readings, hands-on experience, collaboration and reflection helped the candidates to make better connections between literacy and technology, and understand the need and purpose for technology integration in the classroom. One candidate noted “The readings in this course gave me a whole new perspective about technology.” Another observed that guest presenters helped her see how “technology was implemented in different classrooms.” In all, most teacher candidates were able to link technology to the needs of children in the information age. They were also able to explain and justify the need for technology integration. This candidate exemplified such thinking:

I never really knew how much technology influences the learning of literacy. This course has helped me realize that we live in a constantly changing world in terms of technology and our students are bringing in all types of technological knowledge to the classroom. The ‘new literacy and technology’ theory also made me realize what schools and districts should be offering their students in terms of technology. Therefore, it is important and almost imperative that we teach our students how to use various technologies so that they can meet the challenges of today’s changing world.

This perspective was echoed by another participant when she noted that technology has influenced and changed the nature of the learners, requiring teachers to adjust or change their pedagogy:

I think technology is very important in today’s classrooms. Our students have become accustomed to immediate feedback and gratification with the use of

computers, the internet and video games. Therefore, their learning styles now encompass this particular style. Children are also extremely visual and seeing their work in different formats and styles whether it is through a web page or PowerPoint e.t.c can be very gratifying.

The recognition that technology might be better aligned to students' learning style demonstrates that the candidate was making connection between technology and learning. The teacher candidates were better able to make connections and justify the need for technology integration based on a totality of their course experiences (Author, 2008). In order to develop technological pedagogical content knowledge in literacy, teacher candidates need these integrated and holistic experiences.

Lessons Learned and Implications

My experience at integrating technology in one literacy course over four semesters supports the saying that "doing is learning." Because I had to teach students how to use various technological tools for instruction, I was forced to learn how to use these tools. Going through the iterative process of inquiry, reflection and refinement, and negotiating existing constraints within the course structure to create conditions necessary for technology integration was very insightful. Refining my course objectives, methods and materials were instrumental to continuous improvement and the evolution of my practice over time. To do that, I relied on colleagues, institutional support, research literature and experimentation to discover things myself. In addition, some of my tech savvy students assisted in teaching the rest of their classmates. My zeal could be traced to my belief in the importance of integrating technology in teacher education and the need to produce

teachers who would demonstrate competence in teaching literacy to children in the 21st century and be competitive in the labor market that is continuously shrinking.

During the course of the study, I played several transforming roles (Rogoff, 1994) which resulted in the acquisition of new skills and dispositions toward new technologies. First, I was a learner and novice, then a teacher and more knowledgeable other. Changes in participation pattern also occurred as I moved through several phases of technology utilization (Hooper & Rieber, 1995; Moersch, 1995). This was not linear but a recursive and ill-structured process that started with the exploration of and familiarization with several technologies. My initial effort was marred by inadequate understanding of how to effectively engage the students and use the technologies as pedagogical tools. However, through critical reflection and feedback from students, I refined my pedagogy, during which I engaged with both integration and reorientation phases of technology utilization. During this time, technology was used more purposefully to rethink course goals, methods, structures and the learning environment. For example, I realized that using a podcast “About me” to introduce myself was effective in modeling podcasting and getting the candidates to prepare a similar podcast about their lives and backgrounds. In addition, engaging teacher candidates in one-on-one blogging gave me better insight into their lives, expectations and academic needs. These experiences shaped my evolving practice and my resolve to explore other learning technologies such as iMovie, clickers, videoconferencing and others.

Being able to critically reflect on why, how and when to integrate technology helped me to use technology as both cognitive, management and motivational tools. Cognitively, students’ learning was facilitated by the use of technology. Technology was

used to restructure the learning environment and extend classroom boundaries in ways that would not have been possible. Constructing and maintaining blogs and wikis, designing virtual books, WebQuests, Swish, electronic portfolios, as well as learning to teach with the smart board, promoted hands-on and inquiry-based learning activities. These in turn promoted critical thinking, as students reflected on each tool, analyzing its affordances and constraints or its suitability for instruction. As a management tool, technology helped me to manage group learning because students worked in groups to set up wikis which they used to document group activities and discussions. E-portfolio was especially useful as an organizational tool for assessing students' work while the wikis facilitated the assessment of group processes and products. Online discussions and activities gave students time and place advantage, allowing them to work at their own convenience. Finally, as a motivational tool, technology was used to foster hands-on activities, engagement and motivation. The complaint about boredom or the theoretical nature of the course reduced drastically after technology was integrated in the course.

Integrating technology helped the candidates to make a better theory to practice connection. For example, the connection between literacy and technology as well as the impact of new technologies on literacy practices became more apparent as students analyzed different tools and their impact on literacy practices. As most students indicated, the realization that each new technology requires new literacies to use it effectively (Baron, 2001) helped them to rationalize the need to continue to learn about and teach with new technologies. They realized that purposeful technology use in the classroom impacts students' literacy acquisition and better prepare them for education and life in the

21st century. This understanding facilitated teacher candidates' interest and commitment to the use of technology for teaching.

Evidence from this study indicated that there was a huge difference between merely exposing students to different technologies or modeling their use versus making them teach with these technologies. Exposure resulted in students being familiar with these tools, yet they did not express confidence in using them in their classrooms. However, when they were required to teach lessons with these technologies, most of them spent hours of their private time practicing how to use them to enhance their instruction, thereby increasing their comfort level with using these tools. This led to increased confidence and self efficacy. As a result, new skills, attitudes, and values toward technology-use were developed. When teachers are confident and comfortable with newer technologies, they not only use them in their classrooms but also become advocates for their colleagues and schools. For example, some participants in this study started to negotiate with their school authorities for the purchase of Interactive White Board, podcasting software and other equipment.

So far, I have discussed the lessons I learned from integrating technology in one graduate literacy courses. The next section will discuss the implications of these experiences.

First, the importance of reflection and self-study cannot be overemphasized in any technology integration process. Educators, who want to integrate technology in their literacy courses need to constantly review, reassess and readjust their instructional decisions to meet course objectives. Teacher educators need to examine their beliefs and be willing to learn new ideas through experimentation and from experts, colleagues and

students. They should be ready to be lifelong learners in this area. Invariably, by initiating action, learning from our mistakes and from students' feedback, the propensity for growth is limitless. Teacher educators need to help their students understand the relationship between literacy and technology through course readings and hands-on projects, while at the same time be self-aware and self-critical of actions taken (Clark et al, 2005). Students should be made to write a reflective paper for each technology-learning experience. To maximize the benefit of this process, teacher candidates should be given a guideline to write quality reflections which would help the instructor to understand their thought processes, successes and challenges. Students' reflection must address how the projects helped or did not help them understand the relationship between literacy and technology.

Second, a successful integration of technology in teacher education requires that technology should not be treated as a peripheral tool but an integral tool with diverse uses and inherent potential to enhance teaching and learning beyond what the traditional methods allow (Niess, 2005). Evidence from this study indicates that teacher preparatory programs would benefit from a model that integrates technology in all courses in teacher education, not just in the methods courses. Technology integration should be done in ways that support teachers in gaining skills and knowledge in teaching different subjects with technology, instead of having a dedicated course for it (AACTE Committee on Innovation & Technology, 2008; Mishra & Koehler, 2006; Niess, 2005; Otero et al., 2005). Method courses should facilitate the reinforcement of skills already learned, as well as provide the opportunity for teacher candidates to effectively apply their technology knowledge in planning, designing, and implementing content specific lessons.

We need to challenge teachers to reconsider their subject matter content and the impact of technology on the development of that subject itself as well as on teaching and learning that subject. That is one effective way to build technological pedagogical content knowledge (TPCK).

Furthermore, effective development of TPCK would require teacher educators to provide multifaceted and holistic learning experiences situated within classroom context. TPCK cannot be achieved with a singular course activity or experience, no matter how robust the experience is. Teacher candidates need sound theoretical knowledge, especially those from the sociocultural theory, new literacies and critical media literacy. These theories will challenge their long-held beliefs and provide a necessary foundational knowledge that will help them justify the need for technology integration. Teacher candidates also need robust hands-on, problem-based approach to learning with new technologies as well as the opportunity to observe models in authentic contexts. In addition, it is important for teacher educators to help their candidates develop participatory learning (Jenkins, Clinton, Purushotma, Robinson & Weigel, 2003) in which distributive expertise would form the nexus of their learning with different technologies. These experiences can be enhanced as teacher candidates engage in creative thinking, planning, designing, practicing and critiquing different literacy technologies. Finally, technology-learning experiences must be reinforced throughout the teacher education program.

Technology integration does not necessarily make the work of instructors easier in all respects, but it does facilitate teaching and learning in remarkable ways. Modeling is very important in any integration effort just as the instructor has to continuously assess

the need or appropriateness of particular technologies for the enhancement of course goals.

A focus on authenticity is very essential. Teacher educators should not just prescribe how to use various technologies for their students but should provide authentic contexts and opportunities for them to develop the skills to create or design integrated instruction using technology. Teacher candidates should be made to weigh the affordances and constraints of different technologies before implementing their use in the classrooms. In addition, educators trying to integrate technology in their courses need to consider course load. Technology integration and projects take a bit of student's time and must be factored in the course design. A slight reduction in course content or assignments would create a balance between content learning and the learning of technology skills. Students might feel overwhelmed or may not have enough time to practice using various technologies if technology projects are simply added to existing course structure without considering course load. It is also necessary to introduce technology in an incremental manner starting with simple to complex ones.

Limitation of the study

This study is limited in scope because only one course and one instructor were involved. This will limit generalizing its findings. In addition, because I was a participant observer and a researcher at the same time, I played insider/outsider roles simultaneously. These multiple roles could lead to a blurring of the researchers' role and could cause potential ethical problems. Merriam (1998) argues that ethical dilemmas usually arise in the collection of data and dissemination of findings where a researcher

takes a totally interactive, collaborative stance. To reduce this ethical dilemma, I consciously reminded myself of my role as a teacher researcher and the need to make the invisible become visible.

Suggestions for further research

This study focused on the experience of one teacher educator at integrating technology in one course and in one setting. While this gives a snap shot of the processes involved and the challenges of integrating technology in teacher education, further studies will be needed that would involve many teacher educators from one or several colleges, in order to get a more holistic view of the processes and challenges of integrating technology in teacher education. In addition, both in-service and preservice teachers participated in this study. It was not clear though, if the in-service teachers effectively transferred the skills they learned from the course to their classrooms. It may be pertinent to observe and study the classroom of in-service teachers after they completed courses that integrate technology, to see which skills and ideas they would transfer from their teacher education courses to their classrooms. This is the same with preservice teachers. Observing this group in their future classrooms would inform educators if the effort at integrating technology in teacher education yields benefits for teachers. Finally, it may be pertinent to study teacher candidates' perspectives about the skills needed to develop technological pedagogical content knowledge (TPCK).

Conclusion

Effective teacher education in the 21st century cannot be realized until teacher education programs are committed to equipping teachers with the skills necessary to effectively teach with technology. This depends to a large extent on teacher educators' beliefs about the efficacy of technology, ability to model technology use and requiring teacher candidates to teach with technology. Obstacles such as fear, time to implement technology pedagogy and other problems would be reduced or eliminated if educators constantly reflect on their teaching and students' learning and continually modify their instruction based on these reflections. My conviction is that learning to teach with new technologies is and should be a lifelong process. As new technologies continue to emerge, we need to constantly update our knowledge in order to improve on our technological pedagogical content knowledge and those of our students.

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**Developing Digital Literacies and Professional Identities:
The Benefits of ePortfolios in Graduate Education**

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Recently, groups such as the American Association of Colleges and Universities and EDUCAUSE have addressed ePortfolios in documenting university-level learning outcomes, and university writing program administrators have similarly focused on portfolios and ePortfolios in course, program, and student self-assessment. Yet less emphasis has been placed upon the role of ePortfolios in graduate education, whether it be to help either business-industry or academy-bound graduates form a professional profile online. An ePortfolio, as Yancey (2004) has suggested, helps to “remediate” the self, allowing the student designer to use multimodal literacies to construct a relationship between technology and identity. For Yancey, an ePortfolio supplies an expansive space for students to develop into professionals “who can make multiple connections and who create depth through multiplicity and elaboration...who can work in visual and verbal and aural modalities...” (p. 751). Similarly, these latter goals of working with multimodal media to produce equally multimodal genres typically reflect programmatic objectives in both technical communication and rhetoric, though the audience for these genres may differ significantly between the workplace and the academy.

Undoubtedly, many graduate students struggle to balance their duties as students, research assistants, teaching assistants, and with jobs outside academe. In addition, they construct professional identities by becoming members of disciplinary organizations, conference participants and attendees, as well as authors of publications. Because of the visibility afforded by ePortfolios in students’ job searches and the many roles they play within an academic setting, we advocate ePortfolios as a powerful way to profile these professional roles for both academic and professional audiences. To document the role ePortfolios can play in graduate student professional development, we rely on a case-

study approach of several graduate student portfolio developers in our Master's Program in Scientific and Technical Communication as well as in our Ph.D. in Rhetoric and Writing and have received permission to discuss artifacts and include screen captures. To ground these possibilities in practice, we will examine these students' rhetorical choices and expansion of their technological literacy through the process of portfolio design and development, as well as their development of a professional identity for both academic and professional audiences. As Selfe (2004) argues, teachers of writing are "paying increased attention to new media texts because students are doing so—and their enthusiasm about reading/viewing/interacting with and composing/designing/authoring such imaginative texts percolates through the sub-strata of composition classrooms" (p. 44). The attention to this new media in the form of an ePortfolio not only serves a professional development function but also enhances students' technological literacy through the design and development process. Given the equally multi-faceted role of ePortfolios, we shall also discuss the implications of ePortfolios in program-based advising and assessment within graduate programs, including documenting achievement of learning outcomes and inevitably becoming tools for placement and overall student success.

Portfolios, Identity Formation, and Multimodality

Given our status as English faculty, we rely primarily on research within the area of technology and writing studies to guide our discussion, but also upon other resources that equalize emphasis on the need for multimodal literacy acquisition and the role ePortfolios play in graduate student professional development and identity formation. In this context and in others, the concept of portfolios in general and ePortfolios in

particular is not new, as many disciplines have experimented with this genre at the course and program levels (B. Cambridge, et al., 2001, D. Cambridge, et al., 2008). Such academic contexts include tenure and promotion review processes that often dictate a portfolio-driven approach to documenting teaching, research, and service achievements. Other academic spaces for portfolio development include the undergraduate writing curriculum, including first-year composition and technical communication, the latter stressing the application of various project management and document design competencies to specific business and industrial settings. These and other contexts for portfolio development suggest that graduate students with a range of career goals can also benefit from a portfolio's abilities to foster the types of self reflection and assessment that they will encounter as future faculty likely to use such portfolio processes with their own students.

Given these diverse contexts, Kimball's (2003) delineation of portfolio types into *working, professional, academic, and presentation* represents a continuum that moves from the private to the public. We rely on Kimball because we believe it important to view these portfolio types as recursive stages along a continuum (Siemans, 2005) rather than as classifications. Yet while these stages are useful in identifying the primary function of a portfolio, the purposeful sampling of artifacts and reflections that define a portfolio are seldom so singular in purpose, and in fact, the ePortfolios we profiles in this article in varying ways address all four of Kimball's types. Nevertheless, a portfolio's purpose drives not only content but also format and delivery. For instance, despite the ability to digitize all aspects of the academic job market search, much of the "portfolio" process continues to be primarily print-based, from the initial cover letter and *curriculum*

vitae to the submission of a dossier—references, transcripts and other artifacts—with the inclusion of an electronic portfolio still an “optional” part of the application. But regardless of the hybrid aspects of academic and professional job market protocols, there are clearly benefits to electronic portfolio development: work can be viewed in its original medium, there exist a wider range of performance indicators, and there are multiple and more immediate audiences.

Besides these audience-based advantages, graduate student professional development in technology-based literacy and communication is significant, not merely because of the need to document technical competencies--web-authoring, digital imaging, and related skills--but also because of the communicative contexts that allow graduate students to view technological documentation as a rhetorical choice that impacts *ethos* and professional identity. Combining the idea of remediated self and identity, Bolter and Grusin (2000) note that “New media offer new opportunities for self-definition” and that when identity is remediated it allows us to “understand a particular medium to other past and present media” (p. 231). They explain that “The remediated self is also evident in ‘virtual communities’ on the Internet [or in an ePortfolio], in which individuals stake out and occupy verbal and visual points of view through textual and graphic manifestations, but at the same time constitute their collective identities as a network of affiliations among these mediated selves” (p. 232). Such a remediated self is increasingly evident through various digital tools that allow users to not only construct a personal identity but also establish connections with other members of the discourse communities. For example, in providing synonyms for ePortfolios, Skiba (2005) refers to these digital dossiers as “virtual identity collections” (p. 246), promoting the idea that through the

gathering, reflecting, and assessing one's own work, an identity emerges. Supporting Skiba's idea that the collection reflect the identity of the creator, St. Amant (2002) claims that the first commandment in his article "The Ten Commandments" is "Thou shalt have a portfolio" (p. 10) and concludes that "until the interviewer meets you in person, you are your portfolio" (p. 12). While St. Amant uses humor to express his point, the necessity of a portfolio is clear from his perspective as a technical communication scholar.

Similar to discussions in technical communication, the National Council of Teachers of English approved guidelines developed by the Multi-Modal Literacies Management Team (2005). Two particular statements are particularly relevant to our support for ePortfolios:

1. Integration of multiple modes of communication and expression can enhance or transform the meaning of the work beyond illustration or decoration.
2. With the development of multi-modal literacy tools, writers are increasingly expected to be responsible for many aspects of the writing, design, and distribution processes that were formerly apportioned to other experts.

In applying these statements to ePortfolios, we see a strong connection between ePortfolios and multimodality, equally well represented by Kimball (2003):

Using the Web as a portfolio medium builds on some of the key strengths of portfolio pedagogies. Most obviously, whereas traditional, paper portfolios have concentrated on presenting written work, web technologies allow portfolio authors to include graphics, audio, and video, giving them

more options for showing what they [students] have accomplished. But even more importantly, the linking inherent in the web matches the goal of tightly integrating the elements of a portfolio and adds opportunities to connect the portfolio to the rest of the world. (p. xvi)

As we stress within the remainder of this article, ePortfolios certainly helped to foster multimodal literacy acquisition among our students. Although students have been able to employ all four of Kimball's portfolio functions—working, professional, academic, and presentation—we foreground the professional and academic functions in the following student portfolios to document how ePortfolios can showcase (or, based on Kimball's language, “present” disciplinary outcomes in both technical communication and rhetoric programs.

Professional Portfolios Models

One distinct advantage of ePortfolios is that their artifacts, if updated and revised, maintain an existence that extends beyond the context that led to their creation, even as we acknowledge the importance of that original context. Notable examples for us include two Master's students in our Scientific and Technical Communication program, Li Yue and Wei Cen. For both international students, there were exigencies that led to their electronic portfolio development. Their program required students to produce a portfolio based on both projects produced in coursework and during an internship experience. Similar to a thesis defense, degree completion culminated in a practicum where in addition to an oral presentation to peers and faculty advisors, each student submitted their portfolios in both print and electronic form. To prepare for the electronic part of this process—one that included web-authoring, flash animation, digital image editing, and

general online design skills—both students enrolled in a three-unit independent study with co-author #2. In addition to the portfolio itself as a final product, each student completed an annotated bibliography of portfolio development research within the field of technical communication; a series of workshops on various technical skills required to complete the portfolio (e.g., Adobe Acrobat, Dreamweaver, Flash, and Photoshop); a review of sample portfolios on the web to determine common design features and artifact choice; and a final reflective essay to overview design choices and how they contributed to the overall portfolio quality.

In this sense, the independent study functioned as a capstone experience for both Yue Li and Cen Wei in ways that are consistent with Johnson-Eilola's and Selber's (2001) recommendations for the role of portfolios in graduate education in technical communication. Although the grade that was attached to the independent study certainly created a sense of exigency and motivation to succeed, equally important was the sheer opportunity to develop the portfolio in a one-semester or, for Yue Li, twelve-week summer session timeframe. This process included developing color schemes, visual themes, and navigation structures. In the case of Yue Li, her portfolio (Figure 1) relies on side and top navigation that is consistent in placement, color, and type. Particularly significant about Yue Li's portfolio is her clear self-identification as a technical communicator.



Figure 1. Yue Li Portfolio Interface.

Throughout the portfolio development process, co-author #2 served as a consultant, meeting with each student to discuss progress and receive status reports similar to the project management cycles common to the technical communication curriculum. And because both co-authors had team-taught a computer utilization course for undergraduates, co-author #1 also served as an advisor, working individually with Wei Cen as she developed familiarity of sophisticated applications that allowed her to develop a consistently and easily navigable digital presence (see Figure 2).

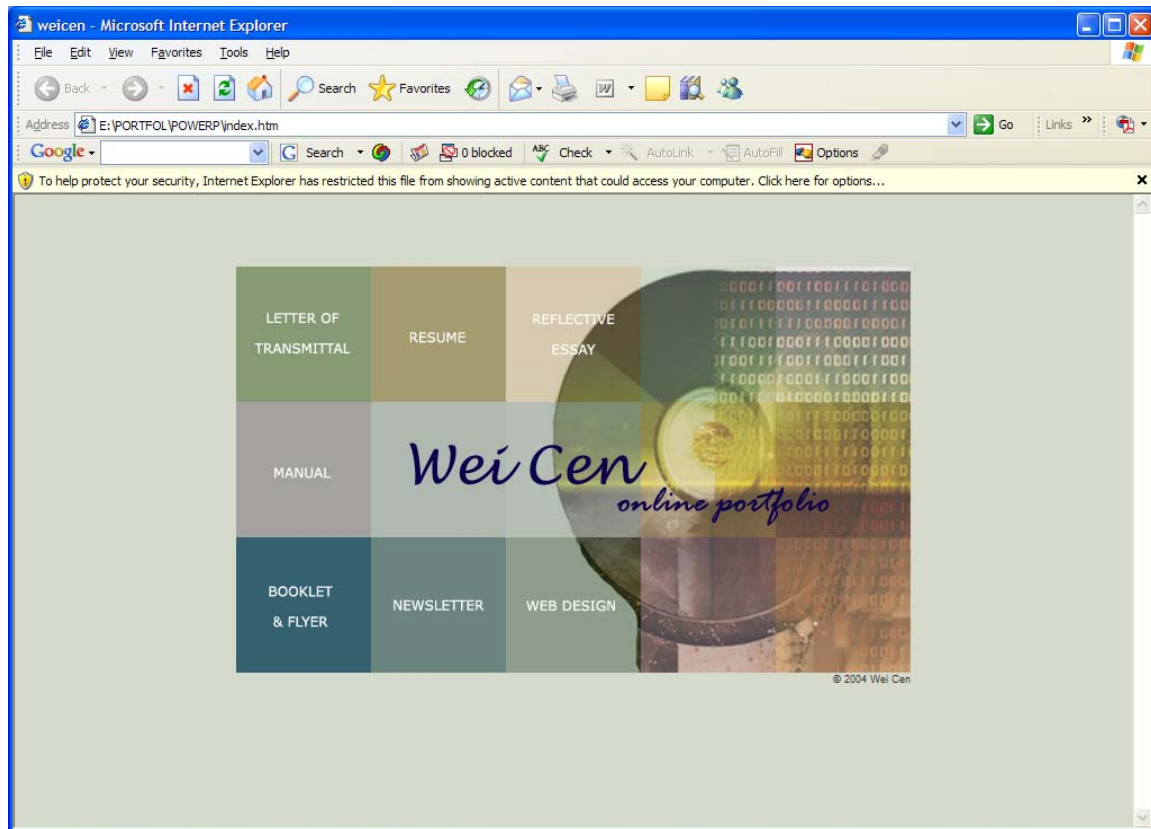


Figure 2. Wei Cen Portfolio Interface.

Although the portfolios differ in design in that Wei Cen relies on a “splash page” navigation into her ePortfolio, there exist similarities in the technological themes, represented by the computer image for Yue Li and a CD for Wei Cen. Also consistent in both portfolios is the emphasis on professional writing genres and audiences. Because the program focused on workplace as opposed to teacher preparation, both students highlighted administrative and research responsibilities, as well as internship experiences that required the development of web sites, brochures, proposals, and manuals. Given the important function of self-reflection within a portfolio—print or electronic—each student also included statements about how her work reflected development as a technical communicator (see Figure 3).

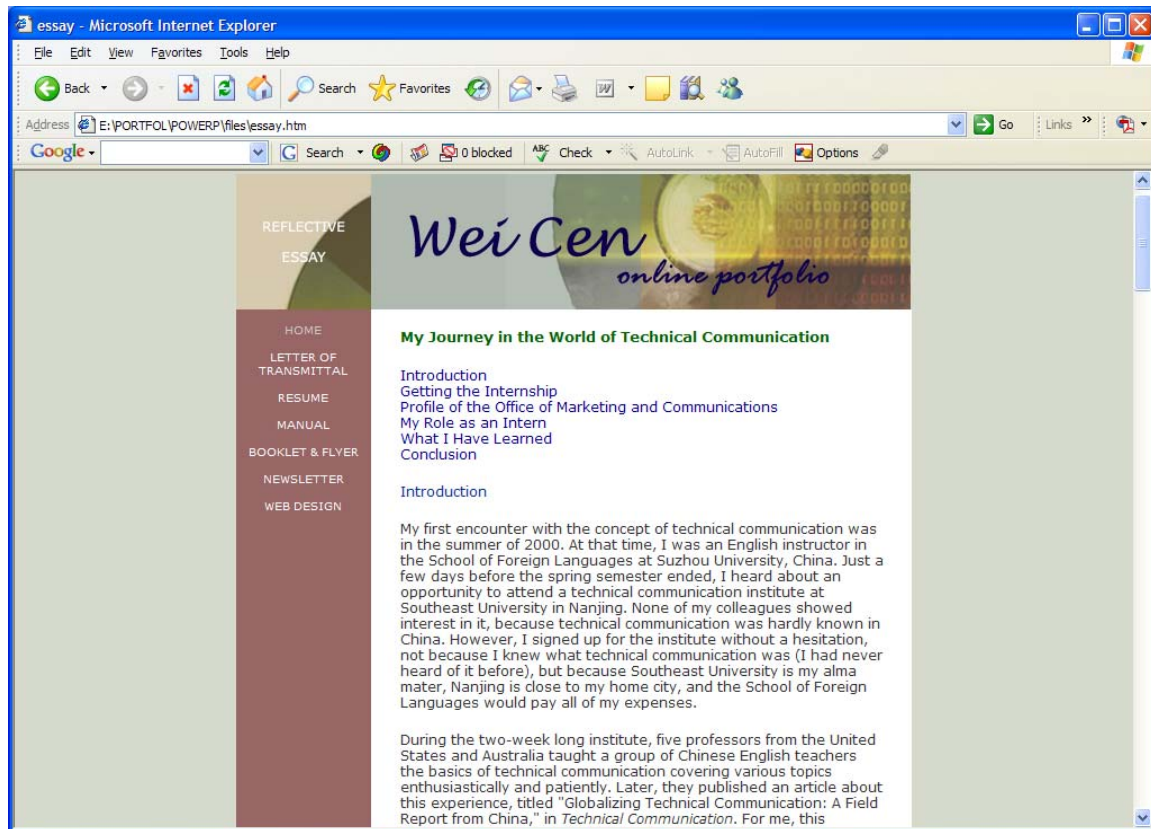


Figure 3. Wei Cen's Reflective Essay.

As Wei Cen notes:

Since the first day I arrived [from China], I have been learning new aspects about technology, communication, technical communication and American culture everyday, absorbing knowledge like a dry sponge absorbing water. The classes I took were interesting and the professors were knowledgeable and eager to shape the students into competent technical communicators. Although I felt a little frustrated at the beginning of my first semester due to the fact that I was thrust into a totally new environment with so much to learn, the frustration gradually turned into confidence. With the help of my professors and thanks to the wonderful technology support on campus, I successfully completed many technical communication projects, including course projects and service-learning

projects, in a variety of genres. In addition, my internship in the Office of Marketing and Communications was a great experience. It provided me with a chance to apply what I had learned in the real work place and test my abilities as a technical communicator.

As Wei Cen's comments suggest, the combination of excitement and anxiety can be challenging for graduate students who add technological literacy acquisition to their many lists of tasks during their degree programs. And very often an ePortfolio helps to document a series of digital skills sets by sheer virtue of its production. Yet for Selber (2004), technological literacy should go beyond skills to intertwine functional, critical, and rhetorical literacies: "There are three subject positions connected to the literacy landscape: students as users of technology [functional], students as questioners of technology [critical], and students as producers of technology [rhetorical] (p. 25). If we apply Selber's literacy landscape to both Yue Li and Wei Cen's ePortfolios, their digital literacy development and their reflection about that development certainly better prepare them to "participate fully and meaningfully in technological activities" (p. 24), particularly given Yue Li's initial hire as a technical communicator for an Ohio company and Wei Cen's return to China as a business writing instructor more familiar with the genres and technologies of the workplace.

Academic Portfolios

Within the Rhetoric and Writing program, portfolio development is initially course-based, helping to combine theory and practice, to align coursework with professional development, and to align ePortfolios with Selber's functional, critical, and rhetorical literacy continuum. A significant example of this process occurs within the

academic portfolio of doctoral candidate Sergey Rybas. Because Sergey came to the program with a degree in Scientific and Technical Communication, he already had a range on online document skills prior to his enrollment in co-author #2's doctoral seminar "Computer-Mediated Writing Theory and Practice," a rhetoric and writing course designed to fulfill a particular outcome of the doctoral program: "Graduates are prepared theoretically and practically to work in computer environments." Because the course is focused on the teaching of writing with computers, Sergey's portfolio (Figure 4) has a more academic teaching emphasis than do Yue Li's and Wei Cen's. But despite the differences in content and in program outcomes, there were definitely similar development processes. As with Yue Li and Wei Cen, Sergey and other students in Computer-Mediated Writing were first asked to locate the web-presence (blog, portfolio, home page, *vitae*, etc.) of a professional in rhetoric and writing studies whose work they admired or whose digital identity intrigued them, in part because of the portfolio or web design itself and also in part because of the content and format conventions specific to the discipline.

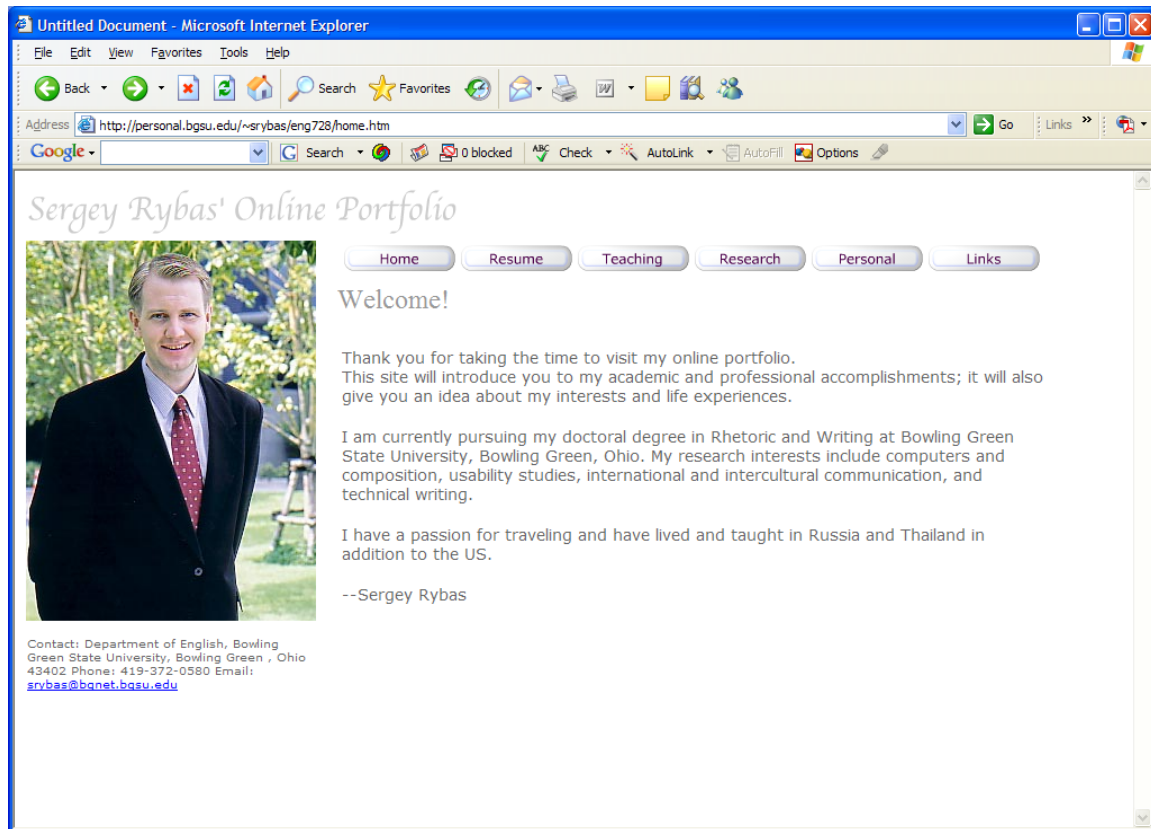


Figure 4. Sergey Rybas Portfolio Interface.

Admittedly, because of their lack of multimedia authoring skills students may not all equally be able to develop as polished a digital identity as Sergey. To equalize the digital skills set, the course provided a more communal opportunity to develop a range of technological literacies. Other forms of development and assessment of design included a physical and virtual peer evaluation process referred to as “Studio Review,” in which students display their work on screen, develop questions about content and form related to a specific document, and provide feedback online to each other as they move around to different computer stations. Once students have returned to their own stations and have reviewed their feedback, they write a “revision plan” for the document that they post to the discussion forum used for the course. What is significant about this process is that the criteria for assessing the portfolios become more collaborative. Online users are often

highly intuitive, even though Padilla (2006) states that what may seem instinctive is actually an evaluative process based on the user's related experience and acquired knowledge. Thus students are encouraged to consider what aspects of a site are working to foster overall accessibility via content and format, not to mention the ways familiar rhetorical principles of audience, purpose, organization, development, and style manifest themselves in multimodal documents. In addition to collaborative forums, co-author #2 continued the individual conference format used with Yue Li and Wei Cen, in this instance at mid-term to help students assess their own progress and set goals for further technological literacy acquisition. During this conference, students share the working version of the portfolio to date, with a focus on the general interface, including navigation and design schemes, along with progress on more sophisticated documents such as a video observation.

An important aspect of this development process is the self-assessment narrative that students complete in the course. Along with scholars that include Kitalong, et al. (2003), we have both assigned a technological literacy biography, an online self-assessment of access to and comfort with computers. This first document helps students to experiment with composing in a digital environment and to consider the differences between print and electronic writing forums. The document is continuously updated during the semester and serves as an audience orientation to the portfolio as students reflect on the artifacts developed and included within it. For Kitalong, et al., this autobiography not only reveals "both idiosyncratic and culturally embedded responses to technology" (p. 220) but also "provides a convenient and non-threatening context within which students can practice software skills and explore typical genres" (p. 224).

An excerpt from Sergey's technology literacy biography (Figure 5) suggests the extent to which such growth is developmental, from his first two years as a Technical Communication student to his current status as a doctoral student:

The three years I have now spent ... have been the time of my continuous exploration and application of computer technology. In May 2004 I received my Master of Arts Degree in Scientific and Technical Communication. Almost all the courses I competed [sic] as part of the program had a computer component to them. I became proficient in using several word processing, image editing, and web-editing software (e.g., Microsoft Office, Adobe Photoshop, Macromedia Dreamweaver, etc.) and had a few chances to try my hand at developing the web, not only using it... Quite recently, I heard some of my fellow students jokingly call me "computer savvy," and I had to almost protest against such a title. Though I can no longer imagine my life without computers, and I rely on them in numerous instances ranging from shopping to researching, I still consider myself a novice user whose experience is limited by a vague and unstable knowledge of nothing more than a tiny fraction of what the new world of computers is hiding. I feel excited to explore this world, ready to withstand the multiple difficulties, and thrilled to embrace the multiple advantages it contains.

Clearly, Sergey's ePortfolio represents the results of his technology-based studies in both technical communication and rhetoric, particularly through its flash button navigation and the use of appropriate image placement for thematic emphasis (Figure 5). His portfolio, along with Yue Li's and Wei Cen's, are strong models in terms of navigation, theme, and aesthetics. As part of the criteria for ePortfolio development in Computer-Mediated

Writing, the class also relied on Huntley's and Latchaw's (1997) "Seven Cs of Interactive Design": *Clarity, Consistency, Curiosity, Coherence, Consideration, Creativity*, and Correctness, along with an "8th C" of our own—*Context*.

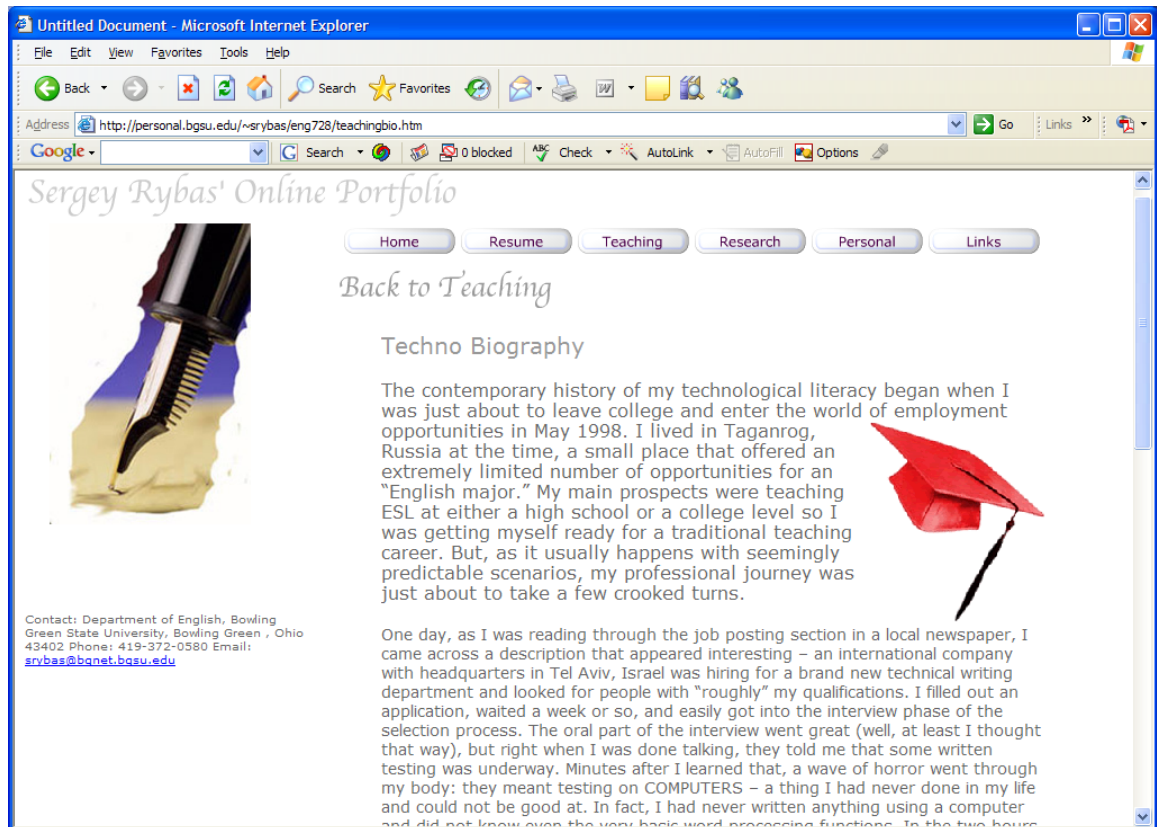


Figure 5. Sergey Rybas Technology Biography.

The Impact of Portfolios Upon Graduate Education

What should be evident from our overview of the portfolio development process both within both the Scientific and Technical Communication Program and the Rhetoric and Writing Program is that it is just that: A *process* that helps students develop the digital identities they often admired in the portfolios of scholars or working professionals within their disciplines. Yet this process is not without constraints. Common problems in requiring portfolios in coursework can include a fading skills set necessary to continue

literacy development and infrequent updating of documents once the external motivation of a grade is no longer there. Granted, some ePortfolios created within both the Scientific and Technical Communication program and the Rhetoric and Writing program suffer this fate and become less viable as digital profiles for both professional and academic job markets. To counteract such dilemmas, both programs have worked to develop ePortfolio initiatives that extend opportunities for development. The first has involved an effort by the Rhetoric and Writing program to better document its learning outcomes for graduates and to encourage the inclusion of artifacts that reflect those outcomes in the portfolios, a goal that is consistent with the recent Conference on College Composition and Communication (2007) Position Statement on Principles and Practices in Electronic Portfolios. Before the program's work with ePortfolios, students filled out a paper-based chart that aligned the outcomes with the artifacts produced in coursework and other forums (conferences, prelims, publications) that demonstrated success in meeting the outcomes. While this process certainly helped the program develop assessment reports and maintain records on doctoral student achievements, the private nature of the activity left the students with little to show. As a result, the program has encouraged the students to link artifacts and outcomes in a variety of digital forms; in addition to the portfolios developed in Computer-Mediated Writing, the program is currently piloting the ePortfolio tool Epsilen for internal assessment. In many ways, this tool (see Figure 6 for a sample student interface) serves a limited, but useful purpose—it provides a digital repository for work in progress, allowing students to upload files and organize them according to a matrix of the seven Rhetoric and Writing learning outcomes.



Figure 6. Sample Portfolio Interface in Epsilon.

As with any digital tool, however, there exist possibilities and constraints. All portfolios in Epsilon possess the same interface, limiting customization and inevitably ownership of one's online identity, something that graduate students have themselves noted. What is lost in a system such as Epsilon is the emphasis on rhetorical choice and reflections about those choices—from artifact selection, to design themes and color schemes, to navigation interface. Undoubtedly, these are the choices that empower graduate student portfolio developers and allow them to develop a unique, but professional digital identity. Within his chronicle of the latest trends of data-base driven portfolio systems such as Epsilon, LiveText, and Task Stream, Kimball (2005) contends that standardized systems, despite ease of use, reduce “power from the student as author

of her or his portfolio and toward the teacher or administrator. The student has decreased authorial control over how his or her portfolio will be structured, linked, or viewed. Even in systems that allow some customization, students are restricted to what the system will allow” (p. 442). For that reason, it is important for students to have the opportunity to continue development of digital skills sets required for the multimodal literacies advocated by both the National Council of Teachers of English (2005) and the Conference on College Composition and Communication (2004, 2007).

To address this need, the Scientific and Technical Communication Program and the Rhetoric and Writing program collaborated on a second project, a \$20,000 Ohio Learning Network grant to develop the “Digital Literacy and Communication Studio.” This professional development series for faculty and graduate instructors includes a significant ePortfolio dimension that includes workshops on portfolio design and development options through use of Adobe PhotoShop and Macromedia Dreamweaver. Rather than the three faculty investigators serving as the workshop facilitators, we have actively attempted to tap graduate students to lead these sessions, presenting not only their portfolios but also delineating the design choices that led to portfolio creation. These efforts are consistent with calls from multimedia scholars that include Wysocki (2004), who advocates opportunities for students to reflect upon and justify the visual choices made for their work, an activity that certainly helps unify graduate education in both technical communication and rhetoric. Similarly, in “Graduate Student Perspectives on the Development of Electronic Portfolios” (2004a, 2004b), doctoral students in educational technology discuss the process for creating and valuing portfolios in their graduate education. Their perspectives add to the dimension of identity and professional

development not only by their reflecting, creating, and designing their portfolios but also by their articulating these experiences in article form (MacDonald, Liu, Lowell, Tsai, & Lohr, 2004a, 2004). These articulations are a vital part of the professional development process. Sergey Rybas, for instance, has recently made a number of presentations on his own and others ePortfolio and blog development, and several screen captures of Yue Li's portfolio were featured in the seventh edition of the *Wadsworth Handbook* as models of effective web design. In this way, ePortfolios have a presentation and showcase function as well.

As we have acknowledged, although portfolios in general and ePortfolios in particular are not new to the discipline, they constitute curricular innovation in their ability to create a sustainable space outside of and beyond a particular course or programmatic affiliation for graduate students to develop digital literacies and professional identities. The portfolios we've profiled to this point are developed via .html and delivered via web or CD-ROM. Yet it is important to consider the role of newer web-based tools—including blogs, wikis, and podcasts—in developing an online presence, as former Rhetoric and Writing graduate student Dr. Lanette Cadle has done through her blog at Techsophist.net (see Figure 7). Cadle has developed a blog to include links to her *curriculum vitae* and the ePortfolio that has continued to evolve since her time in the Computer-Mediated class, where she developed a portfolio similar to Sergey Rybas.

Reflecting on the process, Cadle concludes that

I saw the ePortfolio project as a way to express my grad-school self using dimensional space while also being aware there would be a real audience through the web. Those who didn't believe in the audience's reality would soon, as that

first batch of portfolios were individually linked to the Rhetoric Program site, where they were accessed by future program applicants. In addition to that audience, as each of us entered our job search years, future potential employers also checked the e-portfolios, something I found out during campus visits. Unlike pre-packaged portfolio systems that use templates and ask for specific chunks of text, drafting an ePortfolio from the ground up gave students the freedom to choose categories, media, amount of information given, layout, and all other appearance/content details for the site. Rather than putting on an identity suit as in pre-packaged e-portfolio templates, this allowed the process itself to shape a much more nuanced identity through a repeated cycle: choices, added experience with software tools, and reflection. This cycle allowed each student to begin the project with their current abilities and knowledge while also, through the drafting process, increasing skills with many tools and in many directions. (Cadle, 2009)

What Cadle's current professional identity suggests is the need for continued experimentation with the current range of Web 2.0 tools that allow for even more interactivity between authors and users. Given the free or open-source status of many Web 2.0 tools, there is increased potential for accessibility as well in that many of the more commercial, proprietary, and costly tools are less necessary to produce a viable digital presence. While Cadle's blog and portfolio to show continued growth in professional development, she also has explored the use of wikis for collaboration with colleagues, worked on conference presentation proposals and archiving workshop materials from her national conference presentations using wikis and other tools. From the inception of her original ePortfolio to her current web site as an Assistant Professor,

Cadle has been able to enhance the visual nature of her identity to demonstrate how portfolio and blogging tools can extend a person's reflection not only about pedagogical practices but also about research commitments for tenure evaluation.



Figure 7. Lanette Cadle Blog.

Cadle's current online presence confirms that digital literacy acquisition is a lifelong process that evolves as the tools themselves evolve. Similarly, both technical communication and rhetoric and writing specialists must evolve their curricular practices to acknowledging these shifts in tools and communication processes, learning from students such as Cadle as they begin to explore options for developing a professional identity. As a result, we have included more emphasis on blogs, wikis, and social networking tools in our respective classes as possibilities for ePortfolio development,

allowing for an integrated presence that fits with the types of communication and professional networking processes in both the academy and the workplace.

Ultimately, ePortfolios are a good fit not only with graduate student professional development initiatives but also with other student-centered models in which assessment is team-based and less hierarchical than with the traditional teacher-student relationship, including the studio model process we've profiled throughout this article. Within our context, ePortfolios positively contributed to the quality of graduate education and our students' ability to see themselves both as professional and as future faculty. Such models also better replicate the project management structures within business and industry, with positive implications for student success beyond graduation as students become accustomed to more real-world collaboration. As Gresham and Yancey (2004) articulate, studio models embody *learning spaces* as opposed to *teaching spaces*, something that we believe typifies ePortfolio development, foregrounding the composition, communication, and reflection vital to student-centered learning at both the undergraduate and graduate levels.

Equally important, Johnson-Eilola and Selber (2001) view the graduate student portfolio as a potential capstone activity in order to balance theory and practice:

This structured set of documents actively positions education as the confluence of thinking and doing: specific, concrete artifacts (proposals, websites, newsletters, etc.) are paired with rationales that provide theoretical considerations of audience and purposes, usability test results, ethical considerations, etc. (p. 415)

This exploration and union of “thinking and doing” is developed through the multimodal creation of an ePortfolio that admittedly not all audiences are as currently prepared to review and assess electronically because of differing expectations about genres, not to mention institutional application procedures in both the academy and the workplace that continue to privilege print submission, something Cadle (2009) notes in her concern that “my college within the university sees paper as the standard--efficient and portable, unless you are a scholar who does a fair amount of writing and editing on the web,” and when hiring committees are becoming more receptive to digital review. These constraints suggest that for the current time, the delivery of graduate student professional *ethos* will continue to be hybrid in form, despite the benefits we have overviewed in this article. To acknowledge these audience variables, we work with students in our own programs to determine what artifacts should be both online and print, what should be stored online, and what formats should be on CD or DVD-ROM. The Scientific and Technical Communication Program requires a print copy version of the portfolio for possible use with employers less able or willing to review digital formats, and the Rhetoric and Writing Program encourages student to craft material in both print and electronic formats to correspond with aspects of the academic job market that call for print distribution, such as the standard cover letter and *curriculum vitae*. Another continuing problem is the need for subject specialists in both disciplines with appropriate digital literacy and document design expertise to oversee the portfolio development process, suggesting a need for technological training to sustain the emerging emphasis on multimodal literacy acquisition within graduate programs. Even with these constraints, the Modern Language Association (2007) *Job Information List* features numerous positions calling for expertise

in “digital literacies, new media theory and production, and critical theories of technology,” emphasizing computers and writing as a “plus” or an ability to teach courses via distance or “hybrid delivery modes,” and ultimately suggesting a shift in the field to acknowledge the growing role of technology in both undergraduate and graduate instruction.

Despite constraints on ePortfolio implementation, Siemens (2005) contends that an ePortfolio can be looked at as a continuum bound by several factors, including “the changing nature of learning, and the changing needs of the learner.” Carliner (2005) also discusses benefits of ePortfolios; however, his angle privileges skills management for professionals:

As skills management gains importance, and as managers increasingly rely on skills management tools to identify and track the skills of their workforce, workplace learning and performance professionals need a tool that identifies the full range of skills possessed by workers. E-portfolios provide such a tool. (p. 74)

Through Carliner’s explanation, and through our own overview of ePortfolio development in our graduate programs, we stress the importance of the ePortfolio both inside and outside of academic circles. As we have argued, such a professional development process can prepare students to view themselves, and encourage others to see them, as both technical communicators and rhetoricians. For such development to thrive, however, digital literacy specialists clearly have much work to do in educating colleagues about the benefits of ePortfolios so that their impact may extend beyond individual courses and programs to our larger sub-disciplines.

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Cooking, Recipes, and Work Ethic: Passage of a Heritage Literacy Practice

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I have explored the concept of heritage literacy in previous research (Rumsey 2009). Heritage literacy is the set of multimodal literacy practices used within any community or family across multiple generations and over time. In learning to read and write, as with using any system or technology, people must adapt, adopt, or alienate themselves from particular ways of reading and writing in order to maintain cultural boundaries. Heritage literacy offers a way of conceptualizing how people decide the extent to which they will draw upon intellectual inheritances they've been given from predecessors. In the summer of 2005 I conducted auto-ethnographic research within my home community, called "Smalltown," to better understand the passage of literacy practices between generations and inter-generational technology usage. One finding of this study is of particular note to readers of Literacy and Technology because it concerns the often-overlooked literacies and technologies of cooking and recipe writing, specifically as they were manifested within a population that seems particularly opposed to technological innovation: the Amish. This article, then, explores technological and literacy innovations in an environment where one would least expect to find them.

Let me offer a bit of background of the study. My participants fit into two categories: key participants: comprised of four living generations within my own family, and community participants: people within the community who were living Amish or grew up Amish but opted not to continue within the community. My own family's heritage is Amish as well. Most of my participants, both key and community, were women. This is so partly because Amish women were more apt to talk with another woman, it would have been inappropriate and disrespectful of the community for me to

interview men apart from their wives, and the four generations of my own family that participated are all members of my matriarchal lineage.

Once I coded my data, four different types of literacy practice emerged: *Faith*, *Work*, *Coming of Age*, and *Gathering and Communing*. Literacy artifacts of cooking and recipes fit neatly into the heritage literacy pattern of *Work*, so this article also concerns itself with work. Work within my community refers not only to specific actions done to complete a task but also the concept of “work ethic” or the attitudes and beliefs that dictate how one performs daily tasks. Both work and work ethic are deeply informed by core Amish values of responsibility, modesty, and hospitality (Hostetler), and these core values are evident among the responses given by those currently living Amish and those whose heritage is Amish but who live English. In other words, the same sense of integrity, responsibility, hospitality, and morality is evident in all participants regardless of their lifestyle or livelihood.

Cooking practices and recipes are the foundation of my analysis for several reasons. First, food could be seen historically and traditionally as a “centerpiece of women’s work” (Schenone xii) and therefore a representative sample of the work done by the women interviewed for this analysis. Second, cooking has a long history of technological advancement and change (e.g. standardized measurements, indoor plumbing, electricity, and modernized kitchen gadgets). Third, cooking is representative of multimodal meaning making passed between generations of women. “For generations, women’s ways of cooking were never even put into written words but rather were passed on largely through action, from mother to daughter, friend to friend, and only recently, via diaries and cookbooks and the faded ink of recipe cards” (Schenone xv). And fourth,

cooking, recipes, and food are a deeply important aspect of any cultural heritage, including my own community.

Recipes represent the larger literacy practices within the community, specifically women's work, insofar as they show the "cultural ways of utilizing literacy that people draw upon during a literacy event" (Barton 5). Cultural heritage, according to Stern and Cicala, researchers of ethnicity and culture, is directly linked to food. They quote Janet Theophano, a researcher of the interplay between culture and food:

In the study of American ethnic groups, food has been viewed, like language, as an indicator of the degree to which the group has retained or shed its culture of origin. In fact, it has been argued that food is one of the last aspects of culture to be discarded, that food is particularly resistant to change (Stern and Cicala, *Creative Ethnicity*, 42).

In other words, food is an obvious way a culture passes on intellectual inheritances and is a rich source of evidence of the ways in which community adopts and adapts or alienates themselves according to the constraints, or contexts, of their cultural environment.

The concept that literacies are best understood when examined their context is not a new one. This argument has been made for decades by sociocultural literacy researchers such as Brian Street and Shirley Brice Heath. Specifically I use Street's term "literacy practice" as a combination of the actual events of literacy (Heath) and the cultural, social, and political underpinnings. Work, specifically in terms of recipes and cooking, makes sense given my use of Street's term. The combination of empirical literacy artifacts of recipes, the literacy events of cooking and learning to cook, and the "folk models" or ways of conceptualizing these events together make this a literacy

practice. This article seeks to answer the following questions: How 1.) is work heritage literacy, 2.) is work multimodal, 3.) do participants use recipes as a literacy tool, and 4.) do participants develop facility with this literacy practice?

To answer these questions, I first offer a detailed description of the concept of work as described by my participants. Then I analyze cooking and recipe tools and practices as a type of work practice performed by women in the community. I show how cooks create connections between technologies (recipes) and their cultural values and how recipes are tools best understood within their context. Contextualized understanding of this literacy practice allows me to further develop and describe the specifics of heritage literacy and how my participants pass on an intellectual inheritance. Context also allows me to show what factors impact the adoption or adaptation of literacy tools longitudinally over time.

How Participants Described “Work”

A common question that I asked my community participants is what parents or grandparents had taught them. To this question, almost every participant promptly responded “to work.” Overall, participants’ responses center on work as specific action (e.g. one woman, Miriam¹, stated that her parents taught her “*to work*: to can, sew, garden, and work the fields. They taught [her] to live Amish and to cook”) or on what can best be described as “work ethic” (e.g. Naomi listed “how to work” and “morals” in the same sentence, and Deborah said “there’s a lot of things they taught me, you know, work and be respectful...”).

¹ Pseudonyms have been given to all community participants. Key participants opted to use their real first names.

For members of this community, the attitude they have while performing a given job or chore matters far more than the task itself. John Hostetler states “The attitudes that are of utmost importance in Amish society—cooperation with other human beings and learning to like work—are acquired informally by working with others in the family and community, not by attending school” (Hostetler 247). The attitude and work ethic of members of my community are directly related to a deep and inherited sense of their faith and guiding principles of Biblical scripture (e.g. Colossians 3.17 states “Whatever you do in word or deed, do all in the name of the Lord Jesus, giving thanks through Him to God the Father.”² I Thessalonians 4.11 instructs readers “...to make it your ambition to lead a quiet life and attend to your own business and work with your hands...” And Micah 6.8 says “He has told you, O man, what is good; / And what does the LORD require of you / But to do justice, to love kindness, / And to walk humbly with your God?”)

I asked several participants to describe what they meant by work. Emma described her inherited work ethic as “being there everyday, doing a good job at whatever I do.... When I’m on the job, I hold up my end.” Similarly, Sarah and Amos, English participants who were raised Amish, said that this work ethic “means that you are dependable, not afraid of work; there’s a lot of integrity. You work hard and are honest.” Finally, Marie said, “Mom taught me to work, be on time, and be honest. The one thing Dad always said, ‘Do it right the first time because if you don’t have time to do it right the first time, how are you going to find time to do it a second time?’”

There is a strong work ethic reflected within the actions of my own family members. My sister, Merry, recalls her memories of our grandmother Edna:

² Scripture references are taken from The New American Standard version. This version offers “a rendering as close as possible to the sense of the original Greek and Hebrew texts” (biblegateway.com).

I remember when we were there she never sat still for very long. To get a clear picture of her is hard, I know this sounds weird, but there's this blur. All the sudden she'd be moving from the kitchen to the living room. Vacuuming. Or mopping. I remember she mopped a lot. Or she'd go to the kitchen to the bedroom and back. I'd just see her walk by. I didn't follow her; I'd be doing my imagining thing [playing] and all of the sudden she'd drift into the picture and take us to a picnic or whatever. She always kept busy, but I never knew doing what. That was Grammy, and she's still that way. She vacuumed more than any person I ever knew.

Merry is noting that our grandmother always seemed to be busy at physical work, whether cleaning, cooking, laundry, or other chores. Her recollections make clear that as a child, she was allowed time to relax, play, and use her imagination, but it was a special occasion for Grammy to stop work and take us on a picnic.

My mother, Lucy, relates similar memories of Edna, her mother, during her own childhood. I asked how much she remembers Edna reading. She replied, "Mom was never still long enough to read... Mom did everything at home. Mowed the lawn, the garden... Mom didn't drive until I was 7 or 8. She couldn't go anywhere. She did everything." Again, it is important to note that work seemed to be the focus of my grandmother's time; rarely did she have time to read or do other things she enjoyed because work took precedence. Now that her children are grown and she is a grandmother, my grandma still cleans but she also has time to read and go to musical performances. I also note that the kind of work that Grandma did was always physical work. Working with one's mind, as an academic would, seems to not count as work.

Finally, my great grandmother, Cora, relates similar stories about her mother's work and work ethic:

My mom was very particular about her food and her house... on Fridays the upstairs were cleaned and the beds changed and everything... and then the downstairs was cleaned on Saturdays. We'd scrub the kitchen real hard with a broom, then we'd go out on the porch and the porch would have to be scrubbed. Everything had to be scrubbed. The windows had to be washed every Saturday. Everything was clean and then the baking was done.

Great Grandma remembers that work was done thoroughly and with pride. Note that the floors were scrubbed "hard with a broom." Also note that cleaning "had to be" done. Hard work and cleanliness, apparently, was not an option, and the quality of one's work directly correlated to how physically hard it was. As in the previous recollections, "work," in these contexts is always physical work.

While the description of the Amish work ethic is thus far positive, often work ethic and "doing a good job" translates into working all the time or being constantly busy "doing." My own family members, as is shown in the above quotes, have a history of constant work. Because work is tied so closely to the Amish perception of morality and integrity, guilt often results when a person perceives herself to be not working or not working "hard enough." Emma said, "Sometimes I feel guilty if I'm not working." My grandmother, Edna, recalls memories of her aunt and namesake: "Aunt Edna said that if she ever had one regret, it was that she didn't take time when she had company to just sit and visit. Except on Sunday. She thought she had to keep working." Rebecca, my great

grandmother's sister, remembers the strain this type of guilt placed on her mother and grandmother as they lived in the same home:

[Grandmother] was ambitious. She'd always get up early [even though] she didn't do her own cooking, washing or sewing; there was no need to get up so early. It bothered my mom to take a nap at noon if Grandma knew she was not working... Mom never wanted to be caught resting if Grandma knew it. Mom shouldn't have been that way; it was her home.

It wasn't that there was a competition between mother-in-law and daughter-in-law. Rather, Rebecca's story emphasizes that her mother took immense pride in the quality and quantity of the work she did. Rebecca noted that her own daughter, who is English, "thinks that the Amish think it is a sin to rest." Rebecca goes on to say, "They don't think it is a sin, but they don't rest. A lot of them don't, but maybe not all of them. They do teach not to be lazy."

As I shared portions of this article with participants, Rachel wrote me a letter in response. She noted that while her family does work hard, they also play. She wrote,

I can still hear my mother say, 'All work and no play makes Johnny a dull boy,' so we had 'Fair Play.' My home life consisted of having 'Family Time,' a quiet time [where] each of us read a good book, going on a picnic, the whole family putting together a big picture puzzle, or going to a small town park... We were taught to help plant seeds when quite young, and we taught our children the same. This too was good family time. Children were more appreciative for our garden goodies....

Rachel's response offers some interesting insights into the nature of work within this community. First, as noted above, play is an important part of family life, just like work. Also, there is work ethic evident even within the acts of play that Rachel describes. Planting seeds and sharing this activity as a family is *both* work and play. Work and play together, then, create group cohesion. Finally, Rachel's description puts into perspective that while there is a strong sense of work ethic and hard work within the community, this sense is tempered by a commitment to social activity.

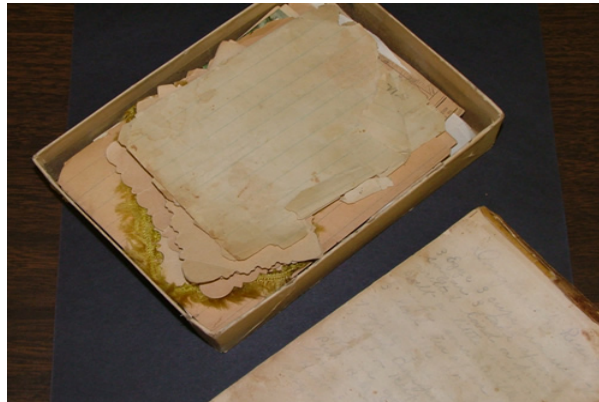
My observations of community members and my own family reflect both the positive and negative aspects of work. During my data collections, when I would arrive at the home of a participant, she would be working. Bethany, Ruth, Becky, Deborah, Martha, Jane, and Leah were all caring for children of various ages at the same time as doing other tasks. Solomon had just come in for lunch from working his fields, and as we chatted, his wife Ida cooked their lunch, which they shared with me. I caught Rachel as she was about to start hoeing in her garden. Dorothy and her daughters were coming out of their home with paint splatters covering them from a day painting the living room. Yet these people, who obviously were hard at work, were generous with their time and hospitable to me as I stopped them in the middle of their workday. I stopped at many homes and Amish businesses where interviews were declined because they were too busy. It was summer, the height of garden harvests, yet so many people kindly offered me 30 or more minutes of their time for something that could easily be seen as "restful."

These illustrations of work ethic show that for my participants, passing on attitudes and integrity is as important, if not more so, as the methods and tools for work activities themselves. Still, the methods and tools of this literacy practice also are

important and can shed additional light both on the attitudes of work ethic and upon the concept of heritage literacy. The next section looks more closely at some specific methods and tools of cooking that have been passed on.

Recipe Analysis

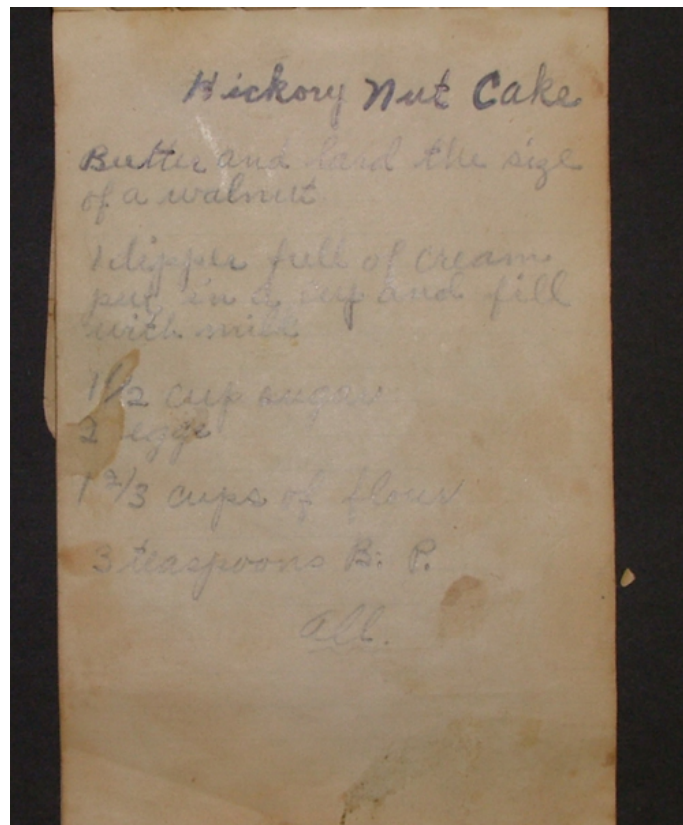
To more fully explore the concept of work as a heritage literacy practice, I now shift my focus to a specific set of recipes. My great grandmother, Cora, has a tablet of paper in which her mother and grandmother kept recipes. The pages are yellowed with age and smudged with fingerprints and perhaps spilled ingredients. The tablet is bound at the top and all the recipes are handwritten. Here is a picture of the tablet and other loose papers kept in their original box:



Some recipes within the collection are titled as to whoever gave the original recipe. For example, one recipe is for “Annie Miller’s Cream Sugar Cookies.” Other times the original author of the recipe is noted elsewhere in the recipe: a Devil’s Food Cake recipe states at the bottom “this is Ola Ruth’s Cake.” Another recipe is titled simply “Cake” and

at the bottom someone has written “From Lydia Ann.” Finally, some recipes in the collection bear no identification of the writer, and at times, of the food being prepared!

Most of the recipes within the collection are for desserts. I’ve selected one recipe because it is representative of the lot and because it exhibits distinct characteristics of contextualized and passed on knowledge. The recipe I’ll be analyzing is one for “Hickory Nut Cake.” Here is an image of the original:



Though I took the photograph using a good quality digital camera, the age and condition of the recipe has resulted in a somewhat faded image. The recipe reads:

Hickory Nut Cake

Butter and lard the size of a walnut

1 dipper full of cream put in a cup and fill with milk
1½ cup sugar
2 eggs
1 2/3 cups of flour
3 teaspoons B.P.
All.

It is necessary to understand the context of the recipe to value how it relates to work and heritage literacy. First, note that the recipe uses both standardized and non-standard measurements. The writer of this recipe could have been “in process” with learning standardized measurements, as these standards began to be fully used in the later half of the 1800s. However, even the “non-standard” measurements were standard for the writer. The size of a walnut is obviously a familiar size to both the person who wrote this recipe and her intended audience. Similarly, the “dipper” that measures cream was a standard measurement in that household. Perhaps these measurements were a way to protect the recipe from copying or to keep it within the family. The various measurement techniques show that the recipe writer took her work seriously. She is using what she knows to create food; she is in the process of learning new techniques; and she has taken the time to write down this process for future reference and building of techné.

This recipe made sense with the constraints of the time period as it did with standard and non-standard measurements. Note that there are no instructions on assembling this cake except for the underlined “All.” There is no oven temperature, no baking times, or serving suggestions. Finally, note that there are no hickory nuts! These are crucial elements to creating this cake, and yet they are missing from this recipe. However, the seeming “lack” of information makes sense in the context of the time period. Instructions were minimal because the knowledge of techné for cooking and

baking surpassed a need for detailed instructions. Baking a cake was such commonplace work for women that instructions may not have been necessary.

Overall, for someone outside the household to make this recipe, extensive questions would have had to be asked. The vagueness of the instructions requires the social aspect of cooking—conversation—to pass on the knowledge. In other words, though cooking was “work” a recipe as vague as this one required conversation, fun, or “play” between friends to create it.

This recipe is also indicative of the financial constraints of the writer and the concept of work intertwined with play. The vast majority of recipes available in Katie’s book are for desserts. Considering the possible financial constraints that this cook faced, this recipe, along with other dessert recipes, was an extravagance. If a recipe cost a lot to prepare, it would be reserved only for special occasions, or those moments of “play.” The recipes that a cook made daily were never written, from what I can see, but instead were memorized. Only those recipes which were rarely made were written down, and this act of recording by hand implies that those recipes were highly valued as well. The day-to-day cooking from memorized recipes could be seen as “work;” whereas this recipe for an extravagant cake is evidence of that chore becoming play.

Another way of looking at how recipes are best understood in context is to look at the tools used to make this recipe. The cooking tools to create the hickory nut cake needed to fit within the limitations of kitchen cooking and early 20th century Amish cultural values. There were assumptions that the recipe writer made for her audience about how they work, and with what tools they would work. The Amish did not use, and still eschew the use of, electricity and the technologies that rely on electricity. First, note

that this recipe is handwritten in a bound notebook. While typewriters, type face, and printing were available when this recipe was written, handwriting is the default for recipes because of convenience and because of financial constraints and social values. Similarly, no electric mixers or other electronic cooking aides are listed. While at the time the recipe was written these technologies did not exist, the Amish still do not use them. My mother recalls that not having an electric mixer greatly shaped how and when particular desserts were made. Because of the amount of time needed to whip egg whites or cream by hand, certain recipes were, again, reserved only for special occasions. Mom said because they were poor,

I grew up without a mixer. We didn't have one. We grew up mixing everything by hand, even egg whites. We'd make this one kind of cheesecake where you had to beat Millnut by hand...it's kind of like evaporated milk... it was a brand sort of. It was a big deal to make because it took so long to make because of the Millnut and the Jello and the Cool Whip. We all loved it, but now it sounds pretty horrid.

Consider that ovens at the time the Hickory Nut Cake recipe was written were wood burning; hence no temperatures are listed (although other recipes from this book note "medium oven"). Serving suggestions were not relevant as food having the capacity to "entertain" was not a relevant concept within the community. Food was important, but not necessarily as a way to entertain or impress strangers. Rather, food was to nourish, to be shared, and to be eaten as family and friends gathered at the dinner table. True, women did and continue to take pride in their cooking, but food as a source of entertainment was a foreign idea.

The recipe uses very basic ingredients. While women took pride in their cooking, meals were generally very simple and made from easily accessible ingredients. One community participant, Miriam, noted that they cooked whatever was on hand. Miriam also noted in our interview that cooking has changed for her because she now has different ingredients to work with. “When I was at home, we cooked with whatever we had in storage: meat, potatoes, vegetables. Now I shop at stores that have a much wider variety of foods to choose from.”

The significant lack of hickory nuts in the list of ingredients are evidence of the basic ingredients available to the writer, and evidence certain assumptions she makes about her readers. First, hickory nuts are listed in the title of the cake; therefore a reader should know that they would be in the mix. Secondly, perhaps this cook had a hickory nut tree on her property and assumes that anyone else using the recipe would have easy access as well. Rebecca, my great grandmother Cora’s older sister, notes that at her home growing up they had a walnut tree. Most of their desserts contained walnuts because of the ready supply. Perhaps the same was true for the cook who gave this recipe to my great great grandmother. Basically, enough could be assumed by the recipe writer about the lifestyle and work habits of her audience, that the lack of hickory nuts in the recipe wasn’t a detrimental mistake.

In general, this recipe is best understood in context and within the constraints that surrounded cooking at the time it was used. There are a lot of assumptions that the recipe writer has made about her audience. She assumes that the reader has the same concepts about work and play, that the reader will be using the same tools for work, and that the reader will have the same work ethic to finish the cake, even though ingredients and

instructions are missing. I've asked my great grandmother if she remembers how to make the recipe, and could she teach me. Her response was to laugh, say no, and then say, "That's just how they wrote recipes back then." It is possible to recreate the cake today, but not without extensive experimentation, which costs time, money, and a lot of flat, burnt cake.

Stages of Literacy Development

To this point I've discussed examples of *what* participants pass on to offspring: conceptions of work and work ethic, and methods and literacy tools cooking as an example of work. My data also offers some insights into *how* participants pass on the abstract concepts of "work ethic" and the concrete usage of cooking tools. Participants pass on literacy knowledge in "stages" which occur as a person becomes more adept at reading, writing, and making connections between literacy tools and behaviors and attitudes of work. This section outlines the "stages" that a woman might pass through on her way to becoming literate in recipes and cooking. These stages reveal the specific moments and phases in the process of passing on a literacy inheritance, and show how heritage literacy is multimodal and best understood in context. There are three "stages" of cooking literacy development: *observation and modeling*, *purposeful instruction*, and *personal responsibility*. There is a sort of apprenticeship that occurs. A girl passes through a progression of responsibilities that is dependent upon her age and elders' perceptions of whether she can "handle" additional responsibility. Girls and women

adopt and adapt recipes learned from their mothers and grandmothers during this apprenticeship.

This three-stage process of the adoption and adaptation of literacy tools like recipes gives us insight into how generations pass on literacy knowledge and how technologies and tools are imbedded in cultural practices and values. Janet Theophano writes that generally,

modifications and modernizations of old recipes and the invention of new dishes in a woman's cookbook represent the combined efforts of many people. Contributions [come] from past generations and from individuals living side by side in small communities, connected to larger social circles, sometimes from one or more cultures.... And while we tend to think of cooking as a delight to our senses, the relationships formed through the creation of these culinary compositions are social, cultural, and economic (Theophano 12).

Note here that cooking is multimodal, passed between generations, and built in layers of understanding and context. By examining the process of acquiring this literacy, it is more apparent how literacy is a combined effort of an individual, the community, and the context, as well as the attitudes about work ethic that have been discussed so far.

Stage one, as noted above, is *observation and modeling*. Basically this stage describes how girls are taught to cook by observing the activities in a kitchen from their earliest years and "helping" by stirring gravy (in the case of my mother) or setting the table (Rebecca, Cora's older sister). Rebecca recalls that cooking, like other activities, was part of her *work*:

We had responsibilities. There were so many of us, we sorta had to take our turn to wash dishes. One would wash and the other one would have to wipe them. After a while there was another one along and we kind of passed on to something different. At a certain age, dad would be doing chores, and mom would be fixing breakfast. She'd call me downstairs to set the table. We all ate breakfast together... We had fried potatoes so often, big round skillet full of fried potatoes. And when she'd put them in the pan of hot lard, they'd make a loud noise. When I heard her dump the potatoes in the hot skillet and I wasn't up yet, boy I was up in a hurry to set the table.

Rebecca is sharing with us how her chores were age-dependent. Once she was old enough, and there was another child coming up behind her, she was shifted into a new role. She learned to do a given task by watching older generations, and when she was old enough she was given the responsibility. Also, Rebecca's story of the potatoes in the pan illustrates how important it was for her to have a good work ethic even at such a young age. Timeliness, dedication, and consistency were valued attitudes and were taught during chores as basic as setting the table for breakfast.

The implications of stage one are first that cooking and baking are a highly gendered activity within the Amish community and to a lesser extent within my own extended family. After a girl finishes the 8th grade and graduates³, her "apprenticeship" is to learn to run a family home, cook, and raise children: the skills most necessary for a woman who is Amish. My immediate family is vastly different as my father cooks daily

³ The Amish are educated only until the 8th grade. After that, many enter a sort of apprenticeship with local employers or at home to learn life skills they will use in adulthood.

and my brother and husband are more than capable in the kitchen, but cooking within this community as a whole and within my distant family is exclusively a female practice. Secondly, observation and modeling is often part of play. Young girls pretend to be cooking long before they are old enough to approach a stove. This is commonplace for anyone who has toddlers. An example of this in my own family would be when my mother allows my niece to wash her plastic play dishes at the sink. My niece is, technically, playing, but she is imitating the work she has seen adults do.

The second stage is *purposeful instruction*. At some point in a girl's upbringing, usually between the ages of 10 and 13, specific cooking lessons are given by mothers and grandmothers. This stage is somewhat blurry in most community members' minds. Direct instruction on cooking most certainly occurred; however most women couldn't recall a specific incident or moment when they were taught to cook. When asked how she learned to cook, Naomi responded "I just picked up cooking. My mother and older sister probably taught me when I was 10 or 11." Naomi's response is representative of most of the community members' response to the same question.

More in-depth examples of purposeful instruction are evident in key participants' memories: my mother distinctly remembers that her grandma (my great grandmother) Cora taught her to make pie. This past summer my great grandmother also taught me to make pie. I remember my mother showing me specific ways of cooking and how to use particular technologies to achieve specific results. For example, she always instructed me to mix muffin batter with a fork so that you would not over-mix it. And finally, this past November, I sat in my sister's tiny apartment and helped her learn to cook with what was on hand in her freezer. She had tacit knowledge, long imbedded from our mother, such

as putting a lid on a pot of water to bring it to boil faster, but she needed instruction in how to create a meal from what she had on hand without specific recipes.

The implications of stage two are primarily that “learning to cook,” like any literacy acquisition, is an ongoing and inexact process. While some women remember receiving specific instructions, most do not. Instead, guidance was mixed with observation, assistantship, and small tasks as girls increased their abilities. This type of literacy learning distinguishes itself from the ways that most participants learned “to read” in school at designated times and locations. While learning to read is a graduate acquisition in a print-rich environment, there are still specific moments in school designated for this purpose. Unlike such purposeful moments in school, learning to cook is expected to be a gradual process that is imbedded within the framework of family and culture.

Stage three is *personal responsibility*. At some point in the development of this literacy practice, women are considered capable of creating dishes and meals on their own. Some women recall learning to cook without a recipe. In Miriam’s case no specific recipes were passed on, only the practice:

I remember that my mother used to say to us girls at noon, “It’s time to fix dinner.” Mother wouldn’t tell us what to fix, we had to figure that out for ourselves. We used to get frustrated because it would have been easier for us if mother had said what we should fix, but we learned to cook from what was on hand in the cellar. This ended up being one of the best things mother could have done for us.

My sister struggled with the very task that Miriam describes: to create a meal, rather than a single dish, from what was available in her cupboards. This is literacy that must work within the constraints of available ingredients and time, just as the Hickory Nut Cake recipe represented.

Other participants noted specific examples of learning to cook which did involve recipes. Deborah recalls that she watched her mother cook a lot then “she handed the recipes over and we had to kind of just follow direction... I mean, she helped us but we had to learn on our own.” Similarly, Dorothy mentioned that what is set on the table for her family on a given night depends greatly on who is doing the cooking. “My older daughters, especially the oldest two, really enjoy cooking and they always like to *try new recipes*.” Dorothy emphasized “try new recipes” when describing her daughter’s cooking because they really enjoy this process. While for some, cooking is a necessary part of daily life, for Dorothy’s daughters, it seems that to cook new dishes and meals is made exciting by the addition of new recipes.

Personal responsibility in cooking presupposes literacy learning. Note that Deborah’s mother handed over the recipes and then set her off to cooking. There is an assumption there that Deborah, at age 10, was capable of reading the recipes and had a knowledge base of the technologies and techniques needed to create a dish. Deborah had tacit knowledge of cooking, literacy capabilities to expand this knowledge, and she was then on her way to developing *techné*, or the craftsmanship of a job well done. Similarly, Dorothy’s older daughters have, perhaps, reached a more advanced and more abstract level of literacy because they are most adept at moving from written recipe instructions to their working knowledge of cooking. They like to experiment, which means they are

comfortable with recipes, but comfort with recipes usually leads to creation of one's own recipes. Hence their techné has developed further.

Implications

The work ethic described by my participants, my analysis of Hickory Nut Cake and the three-stage process detailed above offer several implications about multimodality and heritage literacy as a concept. First, multiple modes evidence the ways that context and literacy interact. Second, heritage literacy is developmental and recursive. And finally, heritage literacy is the process of passing on tools used in context, knowing how to contextualize new tools and technologies into an existing environment, and knowing when and how to alter a context to allow for new tools and technologies.

The multiple modes exhibited in the example cited in this article include pen and paper recipes, images, spoken instructions, smells and tastes of food during preparation and at meals, the layout of a home or kitchen, movements between sink, refrigerator and stove, the layout and order of a recipe, and the tactile connection in learning to make pie crust. These modes, coupled with the work ethic and practices of cooking and sustaining of community that surround these modes, create a rich environment of literacy and cultural context. Note that multiple modes here require physical connections between people and context and literacy. Note also that the same tasks are completed over and over again, evidencing both the connection between literacy and context and that heritage literacy is recursive.

Heritage literacy practices such as work, and specifically cooking and recipes, illustrate how connections between context and literacy play out within a community and a set of values. For example, the literacy artifact of a recipe is not just about "pen-and-

paper literacies.” Cooks create dishes to convey feelings, to nourish, to entertain, or to fulfill obligations. The meaning in the recipe is portrayed by the sight, the smell, the feel, and the image of a particular dish; it is not abstractly contained on a piece of paper with a list of ingredients. In other words, the tool is best understood in its context.

Heritage literacy is developmental and changing. Connection of object to context is always evolving and always growing because objects change and the context changes over time. The object changes because people adopt and adapt new or different technologies and literacies, such as my mother getting an electric mixer or a wider variety of ingredients being available in grocery stores. Also, recipes’ measurements and instructions have become standardized, and ovens’ temperatures can be regulated. Similarly, the context changes as families such as mine leave the Amish community and adopt electricity and other conveniences, as the expectations of a particular Amish district alter due to the bishop overseeing it, and as the needs of a family or a single person dictate how a recipe is used. What the community considers “work” changes the context as well. In my great grandmother’s recollections of work ethic, only physical labor was considered work, whereas writing an article such as this one might not be considered work in the same way.

Further, heritage literacy is recursive. As contexts and objects change, people adapt to these changes and change how they pass on their intellectual and literacy inheritances. The recursiveness of heritage literacy occurs because as tools and contexts change, older generations must depend on younger generations as much as the younger depend on the old. As a member of a “younger generation,” I need the work ethic that my great grandmother, grandmother, and mother have lived for decades before me. I also

need to understand the basic ways of food preparation. I learn that work ethic and their adoption of various tools and literacies from them. But as tools and literacies evolve and change, I often come into contact and adjust to these technologies before the members of previous generations do. The women in my family have allowed me to help them adjust to new technologies like new cooking techniques, or new cuisines. I also pass on this information to my sister as we continually balance what we are learning with what we already know.

This need to continually balance the new, the old, and the changing in terms of tools, technology, and cooking alludes to the fact that heritage literacy is an ongoing process. One does not learn to read and write longitudinally and recursively once. Rather, tools and contexts change, and people must adapt to the change, adopt new technologies, or choose to alienate themselves from technologies.

The contextualized understanding of heritage literacy does not permanently negate the tendencies of instrumental neutrality and the disassociation of humans from technology use. Heritage literacy is this process of passing on tools used in context, knowing how to contextualize new tools in new processes, and knowing when and how to alter a context to allow for new tools and technologies. Members of this community are constantly in the process of adopting and adapting cooking methods, food choices, and recipes. The dipper of cream is now $\frac{1}{4}$ cup, my mother has an electric mixer but chooses to make pie crust by hand, my great grandmother is now diabetic, so desserts are made with artificial sweetener, and she has developed a penchant for Mexican food. Similarly, participants who used tools in contexts of physical work, now use tools in “mental” work. They continually must find ways of reinserting old tools into new

practices and new tools into old practices. They must decide which tools and which practices to keep or adapt, and which to set aside (alienate) in order to ensure the continuation of their community values.

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