A Collaborative Self-study in Digital Literacy in Teacher Education

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Abstract

This paper described the journey the authors took as teacher educators to improve their practice in digital literacy. The focus of the journey was to document the "how to" of the development and integration of digital literacy into courses, and the method was collaborative self-study. The sources of data were ongoing technology training (i.e., training wiki and recordings), integration of digital literacy into courses (i.e., applications of readings and training), and collaborations and co-reflections on the entire process (i.e., phone conversations, video conferencing, and email). Craig's (2009) five exemplars addressed trustworthiness. Literature synthesis and training experiences described how the authors developed their knowledge and skills, while a detailed example of digital literacy integration and their co-reflections explicated both successes and new directions for innovation in practice. Specifically, the literature review informed the decision-making processes for digital literacy integration. Co-reflection enabled the authors to identify a convergence of concepts from the literature: social practices and interactive pedagogy aligned with the learning needs of today's students. Digital literacy training addressed the needed functional skills each author had identified for himself or herself as well as reaffirming the need for ongoing professional development. The authors reaffirmed the notion that mutual rapport, trust, and accountability created a learning zone where they were able to construct a deeper understanding of their practice than individual self-reflection would have done. Finally, by describing one area of digital literacy integration, the authors contributed to the literature on the process of digital literacy integration in teacher education. Through this collaborative self-study, the authors documented how they: (a) used their knowledge and skills to make decisions about the use of technology, (b) reaffirmed the use of interactive pedagogy for digital literacy integration, and (c) confirmed the importance of collaboration and co-reflection for reframing

practice. The authors identified the following areas for continued growth. The authors need to: (a) be more aware of how teaching philosophy can constrain practice, (b) share with students their instructional choices they made to promote students' growth, and (c) seek structured feedback from students in order to better understand the outcomes of digital literacy integration. (Contains one table.)

A Collaborative Self-Study of Digital Literacy in Teacher Education

The integration of technology into teaching and learning has been an important issue in education for some time (Lee, Waxman, Wu, Michko, & Lin, 2013). This integration is vital, as technology "can directly affect . . . understanding of course material . . . and encourage interactive and independent learning" (Sammel, Weir, & Clopper, 2014). In fact, a meta-analysis of the effects of teaching and learning with technology found positive effects for cognitive and affective outcomes (Lee et al., 2013), further supporting its use. Additionally, information doubles every two years, which further reinforces the need for digital literacy (Silver, 2012), as learners will need digital literacy in order to manage larger amounts of knowledge than ever before (ISTE, 2015A). Clearly, digital literacy is "an essential requirement for life in a digital age" (Bawden, 2008, p. 30).

Teacher educators need to integrate digital literacy into their practice. For instance, according to the Standards for Teacher Educators, teacher educators should model teaching proficiency with technology using best practice (ATE, n.d.). In another example, teacher educators are expected to continuously adapt and revise their practice in response to the needs of their students in ways that make the learning meaningful (Loughran, 2002), and in the case of today's students, this means the use of digital literacy (Armstrong, 2014).

In order to integrate digital literacy into teaching and learning, educators benefit from awareness of digital literacy availability, processes for choosing applications, and classroom use of digital literacy (Hora & Holden, 2013). Thus, descriptions of digital literacy integration that detail "how faculty use their knowledge" to make decisions about the actual use of technology (Hora & Holden, 2013; Turpen & Finkelstein, 2009, p. 14) is considered highly beneficial for educators (Cobb, Zhao, & Dean, 2009). The purpose of the self-study research described here

was to document the journey that we took to improve our practice in digital literacy as teacher educators. Our aim in documenting the journey was to contribute to the available literature on digital literacy integration in teacher education. We chose self-study as the method for investigation, since self-study research focuses on improvement of practice (LaBoskey, 2007). As we have worked well together for 15 years, we opted to use a collaborative approach. The methodology of collaboration "is considered a norm" for self-study (Martin & Dismuke, 2015, p. 4), and it facilitates both perspective taking and validation that is part of self-study research (Hamilton & Pinnegar, 2013; Pinnegar & Hamilton, 2009; Samaras, 2011).

Research Questions

The main research question that guided our self-study was how do we improve our practice in digital literacy as teacher educators? We identified sub-questions to guide our work: How do we improve our professional knowledge and skills in digital literacy? How do we integrate our knowledge and skills into our teacher education courses while concurrently addressing the learning needs of today's students?

Method

We chose to conduct a self-study, since it is a method where the "researchers are concerned with both enhanced understanding of teacher education . . . and the immediate improvement of . . . practice" (LaBoskey, 2007, p. 818). We selected a collaborative approach, as it allowed us to study what we read, did, experienced, and thought (Hamilton & Pinnegar, 1998). Our sources of data were our ongoing technology training (i.e., training wiki and recordings), our integration of digital literacy into our courses (i.e., application of readings and training), and our collaborations and co-reflections on the entire process (i.e., phone conversations, video conferencing, and email). Thus, we triangulated data sources for the self-

study (LaBoskey, 2007). Within our ongoing collaborations, we considered the context of our work, explored our teaching identities, processed our experiences during the self-study, and critically reviewed our practice.

To insure that our self-study was trustworthy, we employed the five exemplars for self-study as described by Craig (2009). These exemplars are integrated throughout our article, but we identify them here as a discussion of trustworthiness. For exemplar one, tying our intentional actions to our knowledge growth (Craig, 2009), we detailed the actions we took in the self-study and described the outcomes of those actions for our professional practice. Our collaboration during this process, or "co-reflection-on-practice" (Martin & Dismuke, 2015, p.5), served as a vehicle in our journey towards improvement. We addressed exemplar two, the "pertinent background" of the self-study, by discussing the study context (Craig, 2009, p. 24). Exemplar three focuses on the story of the self-study (Craig, 2009). We addressed this exemplar by presenting a representative example of how we developed and integrated digital literacy into our courses. Exemplar four, implicating identities (Craig, 2009), was discussed via the exploration of our teaching identities—our beliefs, values, and philosophy as teacher educators—and how those identities impacted what we did. Finally, exemplar five—the knowledge we gained—is addressed in the closing section of this article (Craig, 2009).

Our self-study journey had multiple paths that we traveled simultaneously. We read and reviewed literature, participated in training, and integrated our knowledge into our courses as we gained it, all while co-reflecting on our growth in digital literacy. The process was time consuming and overlapping. In order to share our journey in a way that is easily readable, we melded the multiple overlapping paths into one journey by using the research questions as an organizational framework. We begin by defining the layers of context: our setting and ourselves

as participants, including our teaching identities. Next, we answer the question: How do we improve our professional knowledge and skills in digital literacy? We do so by discussing our ongoing review of the literature and our training. We then answer the research question: How do we integrate our knowledge and skills into our teacher education courses while concurrently addressing the learning needs of students? We do so by providing a detailed example of digital literacy integration. To close, we answer the overall research question: How do we improve our practice in digital literacy as teacher educators? We provide a synthesis of the outcomes from our journey towards professional growth in digital literacy and make recommendations for further innovations in our practice.

Context

The Setting and Participants

We are both education faculty members at a large, independent university located in the Southeast. Our primary assignment at the time of the self-study was the undergraduate teacher education program. The program offers multiple majors, including early childhood, elementary, secondary, and exceptional student education. The state department of education and accredited by the Council for the Accreditation of Educator Preparation approved each of the majors. As a result, courses integrate multiple sets of standards, and graduates achieve certification in their major as well as state endorsement for English Speakers of Other Languages. A number of the majors also include a state Reading endorsement. Students demonstrate attainment of standards through the completion of key assessments, which are assignments that include criteria tied to multiple standards. Grading rubrics identify the quality of attainment of the standards, and instructors record the grades from the key assessments in an online assessment system. Course

delivery options include multiple formats: face-to-face—both during the day and in the evenings—hybrid, and online.

When we began the self-study, we taught online in the undergraduate teacher education program. The first author is a generalist, teaching courses required of most majors, and the second author specializes in technology courses. As colleagues, we have had regular discussions about our practice, completed projects together, and presented at conferences related to technology in teacher education. Although we initially had offices side by side at the university, at the time of this study we both worked mostly from home and resided in different states. As a result, most of our communication was through phone, email, and video conferencing.

Teaching Identities

As part of our self-study, we explored our beliefs and values about teaching and our teaching philosophy—the basis of our teaching identities. We did so in order to determine how our beliefs might influence our self-study, particularly since beliefs about technology influence decisions about instruction (Hora & Holden, 2013). Making these notions explicit helped us in our analysis of our professional growth while simultaneously promoting study trustworthiness (Craig, 2009).

Through multiple discussions, we identified our beliefs and values as educators. Our metaphysical stance is that we learn through interaction with our environment (i.e., active learning), and our epistemological view is that the knowledge we gain is tentative and based on function (LaBoskey, 2007; Webb, Metha, & Forbis Jordan, 2013). We base our axiology on what works. For example, we center our values on what works to promote students' learning. Consequently, we believe in addressing students' learning needs, and we hold high expectations for all students (Moore, 2012; Stronge, 2002). Also, employing technology in the teaching-

learning process is an essential value that we hold, but we believe that technology should be matched to the needs of the learners and the task at hand, not used as a stand-alone activity. In particular, we subscribe to the longstanding notion that having clear goals for a learning activity and insuring a fit between the activity and the technology employed are essential (Goodhue & Thompson, 1995).

In our practice, we actualize our beliefs and values. We understand that students learn actively (Arends, 2012; Webb et al., 2013), and address this need with our teaching styles by using interactive methods such as discussion, problem-based instruction, and cooperative learning (Arends, 2012). Additionally, we apply concepts and strategies such as power and economy, clarity, and chunking (Arends, 2012) in both instruction and assessment. We provide students with meaningful content and model best practices (ATE, n.d.). We integrate technology into our teaching and seek continuous improvement in this area, as evidenced by our long-term collaborations.

The beliefs and values to which we subscribe coupled with the way in which we teach explicate our teaching philosophy. We are pragmatists. We believe in doing what works in our teaching, albeit using best practices, and use this philosophy to frame our teaching. This philosophical viewpoint of pragmatism aligns with self-study well, as doing what works enabled us to select our pedagogies for digital literacy integration while being context sensitive (LaBoskey, 2007). Furthermore, exploring our teaching philosophy allowed us to monitor our practice and justify our choices (LaBoskey, 2007).

Literature Review

An important component of our training was our continuous review of the literature on digital literacy and students' learning needs. Although reading about practice is not sufficient to create improvement (Anderson-Patton & Bass, 2002), it did provide us with a grounding to insure that our professional growth was based on best practice, as identified in the Standards for Teacher Educators (ATE, n.d.). Also, by continuing to review literature as we were learning more in technology training, we were able to insure that our practice included the latest information about digital literacy. Finally, our ongoing literature review helped us to address the research question: How do we integrate our knowledge and skills into our teacher education courses while concurrently addressing the learning needs of today's students?

Digital Literacy Defined

To begin, we explored definitions of digital literacy in the literature and developed a definition for our work together. First, we recognized that digital literacy requires prerequisite skills: basic literacy in reading, mathematics, and technology (Bassanjav, 2013). Next, we determined that digital literacy includes information, technological, and media literacy. Information literacy refers to using technology to find, appraise, and use accurate information (Egbert, 2009). Technological literacy is the understanding of technology itself and its impact (Egbert, 2009). Media literacy is the understanding of messages in media: their purposes and teffects (Potter, 2014). Digital literacy focuses on action; it is the "ability to use digital materials" (Jongsermtrakoon & Nasongkhla, 2015, p. 783). Furthermore, digital literacy includes the skills described in this paragraph as well as others defined in the standards for teachers promulgated by the International Society for Technology in Education (ISTE, 2015B). For the purposes of our work, we focused on what was applicable from the literature to our context and

study of practice. We defined digital literacy as encompassing information, technology, and media literacies and included the skills of obtaining and appraising digital materials, managing their use through application and communication, and assessing their impact.

Digital Literacy in Practice

As we reviewed and discussed the literature, we identified some of the knowledge required to implement digital literacy well. We pinpointed two areas of importance: prerequisite skills and pedagogy.

Aside from basic literacy in reading and mathematics, prerequisite or "functional skills" refer to how to use digital media and the applications for them (Dodge, Husain, & Duke, 2011, p. 87; Sammel et al., 2014). As we collaboratively explored this notion, we discussed the need for each of us to reassess our own functional skills, especially in light of the rapid changes in technology. Through ongoing discussion, we identified specific areas that each of us needed to address. For me, improving my digital literacy practices in general, especially how to use applications new to me, was essential. My colleague wanted to explore alternative functions for the multiplicity of applications he already knew.

In the area of pedagogy, we discovered that "social practices" (Dodge et al., 2011, p. 87) are essential for digital literacy. For example, collaboration has been found to promote learning in technology, especially "strategically grouping" learners (Anderson & Contino, 2010, p. 696; Li, Limieux, Vandermeiden, & Nathoo, 2013). In essence, social interaction provides support for digital literacy learning (Li et al., 2013). What we read supported the importance of our own collaborations as well as helped us to define the pedagogy that we would use in digital literacy integration. We selected interactive teaching methods for digital literacy integration not just because they are part of our teaching philosophies, but more importantly, because they included

social practices that promote students' learning with technology (Baasanjav, 2013; Hora & Holden, 2013). For example, the interactive pedagogy of discussion employed in online learning was found to spawn "analysis and reflection by students" when linked to "students' media experiences" (Baasanjav, 2013, p. 587). Furthermore, we identified a variety of other related strategies in the literature. These strategies included the share and learn approach (Anderson & Contino, 2010; Schrum & Levin, 2013), scaffolding and a hands-on method (Lin, Hoffman, & Borengasser, 2013; Schrum & Levin, 2013), and use of a variety of digital media and learning experiences (Anderson & Contino, 2010; Sammel et al., 2014).

Students' Learning Needs

We searched the literature with the purpose of gaining a better understanding of the learning needs of today's students, since the effectiveness of technology depends on context and students are one of those contextual factors (Egbert, 2009). Additionally, as our practice is student-focused, it necessitates a global awareness of today's students' characteristics and needs. However, it is important to note here that the literature on today's students identifies the characteristics and learning needs of the aggregate and is not stereotypical.

Today's students are goal and achievement oriented, curious and driven, and have a get-it-done attitude (Levit, 2015; Oblinger, 2003; Rickes, 2009; Weinstein, 2009). They value community and are social and team oriented (Oblinger, 2003; Rickes, 2009). They use technology to stay constantly connected with their social networks, and they easily navigate and share large amounts of information; it is part of how they live (Badke, 2010; Berk, 2008; Carlson, 2005; Dede, 2005; Pew Research Center, 2010; Rosen, 2009). However, the speed of technology may have contributed to today's students' need for immediacy and their short attention spans (Bray, 2010; Carlson, 2005; Finch, 2015; Fogg, 2009). In addition, because

today's students are facile with technology, they have come to expect technology to be portable and highly interactive with both video and audio components (Carlson, 2005; Fogg, 2009). Finally, today's students feel special and entitled, which may be one of the contributing factors to their need to have things customized and personalized for them (Rickes, 2009; Bray, 2010).

The aforementioned characteristics influence students' learning needs. Dede (2005) described these students as "neomillenial" (p. 7), since technology has changed how today's students engage in learning. Their reliance on technology makes them visual and kinesthetic learners, so lectures are the least effective method of instruction (Carlson, 2005; Foreman, 2003; LeBlanc & Lacey, 2009). Although auditory learning is not their strength, they will "attend to auditory information presented in short bursts" (LeBlanc & Lacey, 2009, ¶ 2). Consequently, a variety of media, such as video (e.g., You Tube) and interactive media (e.g., games, simulations), will engage these students (Carlson, 2005; Dede, 2005; Fogg, 2009). Additionally, content should be presented in manageable chunks to address the short attention spans of today's learners, while simultaneously capitalizing on their skills at navigating information (e.g., web quests) (LeBlanc & Lacey, 2009). Immediate feedback on achievement further addresses today's students' need for personalization, while simultaneously assisting with self-regulation while learning (Espasa & Meneses, 2010). Although, the social nature of these students makes working collaboratively a preferred approach, their need for a structured learning environment necessitates clearly articulated goals for learning tasks regardless of the pedagogy (Nicolleti & Merriman, 2007; Yahr & Schimmel, 2013).

From our readings, we were able to identify specific factors that influence students' learning, thereby addressing one of the factors in the study context and facilitating our integration of digital literacy into our courses. For instance, we chose to use video and audio

digital materials with appropriate interactive pedagogies. Our aim was to provide a level of customization while simultaneously addressing these students' preference for interactive strategies. We also opted to provide clearly articulated goals related to those materials to appeal to their achievement orientation, further engaging them in learning.

Closing Remarks on the Literature

Our ongoing review of the literature focused on multiple areas that broadened and deepened our knowledge. We developed a definition of digital literacy, identified our needed functional skills, and pinpointed pedagogies to use in digital literacy integration. We developed a broad understanding of the learning needs of today's students, which further helped us to address the context of our self-study.

Upon reflection, we observed a convergence of concepts from the literature with the self-study context. The literature emphasized the concepts of social practices and interactive pedagogy in digital literacy teaching, which aligned with the learning needs of today's students. Additionally, our pragmatic teaching philosophy and use of interactive teaching methods, part of the context, aligned with these concepts. Thus, our literature review helped us frame our choices for digital literacy integration into our courses.

Interestingly, of the more than eighty works we read, we found none that focused on describing teacher educators' development of their own digital literacy and integration of digital literacy into courses. Thus, our reading provided additional literature support for our self-study.

Training in Digital Literacy

Although we both integrate technology into our courses, we needed training to address our self-study question: How do we improve our professional knowledge and skills in digital literacy? Because of our literature review, we were able to identify the functional skills that each

of us needed. We then explored the myriad of technology training opportunities provided by our university to find the best fit for our needs. We identified an initiative in our college of education where two faculty members were providing training on use of digital materials (Reeves, 2014).

Training occurred via video conferencing on a monthly basis and focused on digital literacy; that is, we learned about various applications and specific integration strategies related to the field of education and today's neomillenial students. Topics were determined through collaborative discussion with the entire group and based on the group's interests and needs. The topics were varied; they included technology such as mobile applications, cloud storage (e.g., Dropbox), Pinterest, Google classroom, Google docs, augmented reality, mobile apps, live video communication, videos in the classroom (e.g., YouTube), and flipping the classroom.

Part of the training involved participating in a wiki where faculty could share reviews of applications and experiences in integrating digital literacy into their courses. The group collaboratively discussed these wiki in training sessions, with a focus on how to enhance student learning in our courses. The trainer recorded the sessions for later review. Additionally, both the trainers and learners made presentations, sharing how they used various materials and strategies. The process created a collaborative environment that nurtured everyone's development, from novice to expert. Training continues at this writing and becoming a source of support for many faculty members as they integrate digital literacy.

The first outcome from our training was increased knowledge and skills in digital literacy. Most importantly, we each were able to address the specific functional skills that we had identified from our collaborative discussion of the literature. For example, I learned how to use applications for comics and animations for both iPads and PCs and developed a handout for

students with information about the applications. Subsequently, I integrated the use of comics/animations into a course assignment on the communication of directions for teaching activities. Additionally, I became more familiar with the organization of YouTube and other video-based websites, integrating their use into each of my courses. I learned about cloud storage, and I am now proficient with using Google Drive. My colleague focused on new uses for applications such as speaking avatars (e.g., Voki), photo editing (e.g., iPiccy, Instagram), and social media communication tools (e.g., Facebook, Wikispaces). For instance, my colleague integrated speaking avatars into the assignment description sections of syllabi. The avatars provided further clarity on assignments by supporting the plain text in the syllabus with a visual and auditory component.

A second learning outcome came from the training. As we increased our knowledge and developed more skills, we increased self-confidence in our integration of digital literacy into our courses. In our co-reflections on our training, I shared with my colleague: "Through exploring the various applications in training, I felt much more confident in using them. I was able to take risks with integration that I wouldn't have been able to do on my own." Likewise, he shared: "Ultimately, the training assisted me greatly with the integration of digital literacy into my courses. I felt energized and renewed, even more confident than before."

An unintended learning outcome from training was the expansion of our collaborative learning community. The live video training coupled with the sense of community that we experienced sparked learning and excitement about digital literacy integration. Our collaborative co-reflections helped us to identify this outcome, as illustrated in the following quote from the second author's email correspondence.

> The collaborative nature of these trainings allowed me to discuss, evaluate, rethink, and refresh my current practices. My colleagues provided many insights about what and how they were using digital media in their own teaching. This live video dialogue gave me the desire to strive for more feedback from my colleagues, the opportunity to gauge my own learning progress, and the impetus to delve into the literature further.

Clearly, our social interactions provided support for our digital literacy learning (Li et al., 2013).

Additionally, we reaffirmed the need for ongoing professional development for teaching effectiveness. In fact, a comment from the second author during our co-reflection clearly sums up this notion. “Soon it became very apparent that professional development was not a semiannual event; rather, it was something that had to be a part of my career on a quotidian basis.” This learning outcome aligns with Dede’s (2005) notion that through professional development, faculty can “accommodate neomillennial learning styles to continue teaching effectively as the nature of students evolves” (p. 7).

Digital Literacy Integration

Our integration of digital literacy into our courses occurred while we were gaining new knowledge and skills. Our ongoing co-reflections highlighted the fact that, between us, we had selected a myriad of digital materials for integration. The following excerpt from the second author’s email provides one example.

> As the new semester began, I thought about how my students were going to love the new format of my courses. I provided the students a syllabus with speaking avatars, animated clips, YouTube links, and internet activities that had them researching and evaluating technology in various content areas.

The integration of digital literacy into our courses took multiple paths. Individually, we applied the literature and our training to integration, selecting what worked for each of us given the context. This approach enabled us to integrate diverse media, as depicted in Table 1. Due to these multiple paths and diversity in media, for the purposes of this article we chose to share one complete example of integration. In this way, we are able to provide a detailed description of the "how to" of digital literacy integration and document one of the paths on our journey to improve our practice in digital literacy.

Our selected example is the use of videos in an elementary classroom management course, an undergraduate teacher education course for which I, the first author, am responsible. Although I have used videos in my courses for years, my previous focus was simply using videos as a way to provide visual examples of content taught accompanied by a general discussion. Due to my increased knowledge and skills from reading and training, I was able to reframe what I was doing previously in the teaching and learning process to make digital media integration more meaningful.

Video Selection

I began the video integration by reviewing multiple websites and videos. I found locating and accessing videos easy, since I had learned about how a number of websites operate in training. However, I wanted to identify high-quality digital materials, a notion in line with knowledge I gained from reviewing the literature on digital literacy (Jongsermtrakoon & Nasongkhla, 2015). As a result, I selected videos by adapting some of the criteria from the Assessment Rubric developed by Morain and Swarts (2012) for rating instructional videos. I selected criteria based upon the teaching-learning context, including addressing my students' learning needs. The four criteria follow:

(a) ease of video access to insure a smooth beginning to the assignment,

(b) "viewablility" of the video to maintain students' attention,

(c) video content "accuracy" to insure alignment with course content and the key assessment criteria in order to promote students' learning, and

(d) video "engagement" to motivate students to use the strategy depicted in the video (Morain & Swarts, 2012, p. 8). Following these criteria enabled me to select videos that realistically illustrated specific areas of classroom management in real-life classrooms.

Additionally, I wanted to address students' learning needs for variety with the videos. This was achieved by using high-quality videos for multiple content topics, from multiple video sources (e.g., You Tube, The Teacher Channel), and by allowing students to choose from a list of videos on a specific topic (Anderson & Contino, 2010; Fogg, 2009; LeBlanc & Lacey, 2009; Morain & Swarts, 2013).

Discussion Questions

For the video assignments in the course, students viewed the videos and posted their answers to the related questions on the discussion board in our online course platform. In a second posting, students commented reflectively on at least one colleague's answer. The decision to use discussion as the pedagogy aligns with best practice in digital literacy and my pragmatic teaching philosophy (Hora & Holden, 2013; Li et al., 2013). By using discussion, I hoped to facilitate learning using an interactive approach that promotes students' "conceptual understanding", "involvement and engagement", and "thinking processes" (Arends, 2012, p. 439; Webb et al., 2013).

I generated the discussion questions to achieve the following goals: (1) promote students' thinking about the knowledge, skills, and strategies depicted in the video and (2) encourage

cognitive connections between the video and the course content. These goals align well with the outcomes of the discussion pedagogy (Arends, 2012) while simultaneously scaffolding learning. Furthermore, they addressed students' learning needs for interactive pedagogy with goals and structure (Lin et al., 2013; Nicolleti & Merriman, 2007; Yahr & Schimmel, 2013).

I graded the discussions based on criteria. These criteria were (a) answer the question posed, (b) comment on at least one colleague's answer, (c) demonstrate reflective thinking in the answers, (d) support the answers with citations and references, (e) employ respectful interactions, and (f) use dialogue that is clear and constructive. These grading criteria set expectations, insured full participation, and set parameters for the discussion itself, thereby providing further structure for students' learning (Nicolleti & Merriman, 2007; Yahr & Schimmel, 2013).

Collaborative Analysis of Digital Literacy Integration

During the course of our self-study, we "co-reflected" on each other's practice, asking each other questions about our teaching and learning (Craig, 2009; Martin & Dismuke, 2015, p.5). Our collaborative interactions helped us to process our decisions in greater depth than we would have if we were working alone by facilitating perspective taking on our practice (Hamilton & Pinnegar, 2013; Pinnegar & Hamilton, 2009; Samaras, 2011). Examples of co-reflection related to the representative example of digital literacy integration follow.

During one of our co-reflection sessions when we were discussing my video assignments, I shared:

> I am pleased with my integration of the videos and discussion questions; the students met the goals that I had set. They were analytical in their reflections on the videos, the answers to the questions, and when commenting on their colleagues' answers. They also

demonstrated the depth of their knowledge by making explicit connections between the videos and the course content. Interestingly, several of them commented to me that they really liked having feedback from their colleagues on the discussion questions; they said it helped their thinking about the content.

These outcomes were exactly what I had hoped for when I designed the assignments. As I had intended, my students demonstrated a "conceptual understanding" of the content and "thinking processes" that documented the cognitive connections they made (Arends, 2012, p. 439). I also shared with my colleague another outcome that I had noticed: engagement (Arends, 2012, p. 439). "I was struck by how many students said they enjoyed the videos and found them engaging. My previous use of videos never generated comments about engagement." My colleague queried, "What do you think you did to generate this outcome?" Reflecting on his question, I shared: "Maybe my selection of videos using criteria helped to promote this engagement, especially since engagement was one of the criteria. It also may have to do with the structure that I provided for the discussion questions. Additionally, since they liked their colleague's feedback, that feedback may have played a part with their engagement as well. This is an area worth more exploration."

As we talked, we connected the positive outcomes to what we had learned in our reading. It appeared that the structure I provided with the discussion questions and grading criteria supported the work of Bassanjav (2013) who found that when online discussions are relevant to students' media experiences, it generated reflection and analysis within the discussion. Also, discussion comments appeared to promote students' "conceptual understanding", "involvement and engagement", and "thinking processes" (Arends, 2012, p. 439; Webb et al., 2013), further supporting the use of this interactive pedagogy. Certainly, processing my practice with my

colleague clarified the connections between what I had read and what I did (Hamilton & Pinnegar, 1998), thus deepening the assessment of my own practice.

As our collaborative analysis of the video assignments progressed, I told my colleague that our discussion helped me realize something else. "I didn't share the video selection criteria with my students, nor did I ask for their feedback. I'm thinking that I missed an opportunity here." Sharing the criteria may have allowed me to promote students' growth in digital literacy beyond modeling practice, while soliciting their feedback may have enhanced their feeling of support for continuous improvement (Lawless & Pelligrino, 2007; Schrum & Levin, 2013). Perhaps not doing so was a missed opportunity.

Further co-reflection prompted us to consider the context of the study, specifically the influence of teaching philosophy. My pragmatic "what works" focus coupled with the self-study focus on the "how to" of digital literacy integration may have caused me to miss the aforementioned opportunity for students' growth. Although the "how to" process was the focus of the collaborative self-study, it also may have prevented me from seeing that obtaining targeted feedback on digital literacy integration outcomes from students may have been beneficial (e.g., student engagement in the video discussions). Clearly, our co-reflection enabled perspective taking for me. I saw the need to reframe how I think about the integration of digital literacy in my courses beyond "what works" and "how to". In essence, I was able to identify new directions for innovation in my practice and students' learning.

Additionally, our co-reflections also helped us to see how the level of rapport, trust, and accountability between us enabled us to be open and vulnerable (Samaras & Freese, 2009). Without that vulnerability, we would not have been able to identify new directions for teaching

and learning. We truly created the "fertile ground for innovation" and the professional support that improves practice (Barak, 2015, p. 50; Martin & Dismuke, 2015).

Conclusion and Implications

How did we improve our practice in digital literacy as teacher educators? Without question, through our self-study we improved our practice. By focusing on the "how to" of our teaching and learning, we documented our professional growth (Samaras & Freeze, 2009). Furthermore, by describing our journey—knowledge, skills, and integration of digital literacy—we were able to contribute to the literature on teaching and learning that promotes using technology in a way that is beneficial to educators (Hora & Holden, 2013). We believe it was a step forward in our ongoing journey of digital literacy integration. Here we summarize our learning outcomes and make recommendations for future innovations.

First, through our ongoing literature review, we developed a definition of digital literacy, identified functional skills for our digital literacy growth that provided the focus for our training, ascertained the pedagogies that were most effective in digital literacy integration, and discovered ways to address the learning needs of today's students. As a result, our literature review informed our decision-making processes for digital literacy integration.

Second, co-reflection enabled us to identify a convergence of concepts from the literature: social practices and interactive pedagogy aligned with the learning needs of today's students. These concepts connected with the context of our self-study: our pragmatic teaching philosophies and our use of interactive pedagogies. This convergence of concepts and context framed some of the choices we made when integrating digital literacy into our courses.

Third, our digital literacy training addressed the needed functional skills each of us had identified for ourselves. Furthermore, the social interactions in our trainings further energized

our growth (Li et al., 2013). Training also reinforced for us the need for ongoing professional development for continuous improvement of our practice (Lawless & Pelligrino, 2007).

Fourth, by sharing a representative example of digital literacy integration, we were able to document one of the paths we took in digital literacy integration. We described how we used our digital literacy knowledge—from the literature and training—to make decisions about the integration of digital literacy (Hora & Holden, 2013; Turpen & Finklestein, 2009). By doing so, we have contributed to the literature on the process of digital literacy integration in teacher education.

Fifth, we reaffirmed that our mutual rapport, trust, and accountability created a learning zone where we were able to construct a deeper understanding of our practice than individual self-reflection would have done (Samaras et al., 2014; Samaras & Freese, 2009). This zone allowed us to be vulnerable in our co-reflection on practice, which yielded opportunities for further innovation. For instance, our co-reflections helped me to see my work via a new perspective (Barak, 2015; Hamilton & Pinnegar, 2013; Pinnegar & Hamilton, 2009; Samaras, 2011). I discovered that I needed to reframe my practice by looking beyond my immediate focus. Additionally, we determined that we must consider other sources of feedback in our co-reflections; we must ask questions that help us to take "different perspectives into account", particularly those of our students (Craig, 2009, p. 24). Perhaps use of a "reflection document" that collects data on students' learning (Johnston, 2012, p. 142) would promote this goal.

Although we attained the purpose of our study and learned much from our journey, we still feel there is more to achieve in our future practice beyond documenting the process of digital literacy integration. We have identified three additional paths to pursue. First, we will try to stretch ourselves beyond our immediate focus and be more aware of how our teaching

philosophies may constrain our practice. Second, we will share information about our choices for the teaching-learning process with our students in the hopes that doing so will promote their growth as well as ours. Finally, we will seek structured feedback from our students on our practice. Doing so will enable us to more deeply analyze the outcomes of our digital literacy integration.

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Table 1. Digital Literacy Integration: Technology, Use, and Purpose

First Author Technology	Integration	Goal
Comics and Animations	Student assignment to create teaching activity directions	Enhance learning engagement and communication
Videos	Student assignment to view and discuss instructor posed questions about classroom management	Analyze concepts of rules, teacher behaviors, incentives, positive classroom climate, and high expectations
	Student assignment to view and discuss instructor posed questions about teaching methods	Analyze concepts of differentiated learning and cooperative learning
	Student assignment to view and discuss instructor posed questions about philosophies of education and school violence prevention	Analyze teachers' philosophies of education in action and strategies for school violence prevention

Second Author

Technology	Integration	Goal
Voki	Student assignments	Facilitate students' understanding of assignments in course syllabus
Applications	Student assignment to choose when and in what scenario to use apps, discuss instructor posed questions, and defend their choices	Analyze use of applications in the teaching-learning process and justify choices
Google Voice & Google Docs	Student communication	Enhance opportunities for communication and feedback
Blogs	Student collaboration	Enhance casual and informative posts via mobile devices