

This Is How We Do It: Authentic and Strategic Technology Use by Novice English Teachers

[Betina Hsieh](#)

California State University, Long Beach

As the definition of literacy in the 21st century expands beyond print texts to include digital texts, media objects, images, sounds and social practices, what it means to be an English teacher in secondary schools also is shifting and growing in complexity. While there are many resources for integrating technology in the classroom, there remain few studies focused on how teachers are making choices related to technology use. This case study compares the ways in which two teachers make specific choices in relation to technology in their early careers as secondary English teachers. In doing so, the focal teachers are positioned as active agents (Lasky, 2005) in their professional development, from preservice to their early career classrooms, using technology strategically as a resource to within two distinct social settings: the preservice classroom where they are students, and the secondary classroom, where they are teachers.

As literacy in the 21st century expands beyond print to include digital texts, media objects, images, sounds and social practices, what it means to be an English teacher in secondary schools is also shifting and growing in complexity. A recent large nationwide survey indicates that although technology integration is a priority for both teacher candidates (TCs) and teacher educators, the actual incorporation of technology into lesson planning and pedagogical practice remains inconsistent (Pasternak et al., 2016). While the issue of access to resources for integrating digital literacies and technology in the classroom is being addressed to some degree in the research (Herrington, Hodgson, & Moran, 2009; Johnson, 2014), much remains to be learned about the ways teachers are making choices related to technology use, both inside their classrooms and as professionals outside of the classroom.

The case study described in this article examined how two teachers demonstrated and talked about their use of technology in their early careers as secondary English teachers, with a focus on the strategic ways in which Twitter supported their professional development and intersected with other forms of technology use. In doing so, the study focused on the ways in which these teachers found Twitter and other technologies to be meaningful tools in their classroom and professional practices; how each teacher's personal dispositions toward Twitter specifically shaped her actual use of this social media tool; and the role that teacher educators can play in supporting positive dispositions toward technology and social media in preservice candidates' future professional practice.

Twitter is a microblogging platform that limits user posts ("tweets") to 140 characters. Users build networks through following others (subscribing to their tweets) and as others follow them. Particular tweets can be "liked" by clicking a heart icon on the tweet (Twitter, 2016). Twitter has become a relatively popular social media site, with 24% of all online adult users and 29% of online users with a baccalaureate degree or higher reporting use of Twitter in 2016 (Pew Research Center, 2016).

Technology, Teaching and Agency

While this study focuses primarily on and draws heavily from uses of Twitter in professional contexts, the use of Twitter as a social media tool, both in this study, and in the literature, is part of a larger conversation on the roles and perceptions of technology in English teachers' work. Technology and multimodal literacies as integral elements of robust English classroom instruction have been focal points for both professional organizations (International Society for Technology in Education, 2000, 2016; National Council of Teachers of English, 1996, 2013) and researchers (The New London Group, 1996) since the turn of the 21st century. In relation to the English classroom, studies have investigated and evaluated technology as a literacy tool; when and how to use technology appropriately; and opportunities to use technology that demonstrate an awareness of issues of equity and diversity (Pope & Golub, 2000).

Social media is a form of technology with multiple potential professional uses, in and outside of the classroom. An emerging field of scholarship has begun looking at the role of online communities, including those formed through social media (including Twitter, which is featured prominently in this study), as a professional learning tool that can promote professional community among educators (Carpenter & Krutka, 2014, 2015; Hur & Brush, 2009).

This early research indicates the promise of participating in online communities in terms of teacher learning, connecting with other educators (to avoid isolation), and exploring new ideas with some anonymity, which paradoxically, allows for teachers to seek resources and support more openly (Hur & Brush, 2009). Studies on Twitter and microblogging, focused on TCs, have indicated use of such spaces for candidates to reflect on their own learning; establish community with fellow preservice teachers, current practicing educators and their professor; retweet or share resources; and gain information related to their professional learning (Benko, Guise, Earl, & Gill, 2016; Carpenter, 2015; Mills, 2014; Wright, 2010). In English education, Twitter has also been used by teacher educators to promote the development of teacher positionality in relation to sociopolitical matters and to connect to literacy experts in the field (Benko et al., 2016; Cook & Bissonnette, 2016).

While uses of technology and social media have engendered growing interest in educational research and practice, there has been less focus on the role of agency and dispositions in the choices that teachers make to engage with various forms of technology professionally.

The studies that do explore dispositions in relation to technology integration are focused exclusively on classroom practice. These studies have indicated that English TCs have mixed dispositions toward technology. Some regard technology with suspicion, as a potential replacement for traditional texts; others see it as a tool to engage students quickly with ideas, but view the responsibility of teaching critical media literacy as an extra duty rather than an extension of general literacy practices (Ortega, 2013; Pasternak, 2007; Pasternak et al., 2016; Pope & Golub, 2000).

If English TCs are to move away from notions of technology as supplementary and toward notions of technology as integral to their professional practice and identities, TCs must have opportunities for practice; see models of teacher educators using technology strategically and intentionally for instructional purposes; and be able to reflect on their epistemologies and conceptions of technology in their classrooms (Ortega, 2013; Pasternak, 2007; Pasternak et al., 2016). In doing so, TCs may approach technology with more confidence, competence, and creativity as they enter the classroom.

A sense of confidence, competence, and creativity are all positive dispositions toward technology that can shape an understanding of one's professional identity. As part of the larger fields of teacher education and teacher development, dispositions and agency have been linked to the development of a teacher professional identity that includes the skills necessary to engage and interact with others in ways that make a positive difference with students and in other educational contexts (Diez, 2007; Lasky, 2005; Shoffner et al., 2014).

Positioning teachers as active agents, with particular dispositions that inform their professional choices, moves discussion of technology use beyond notions of skills-based competency. This view of teachers shifts the discussion from what teachers can do (in their classrooms) with technology to how and why teachers make choices to integrate specific forms of technology (including social media like Twitter) in specific ways as part of their overall professional practice. It also allows for an examination of the conditions that might support TCs in developing more positive dispositions toward technology in their professional lives in and outside of the classroom, a gap in the current literature in the field.

Methodology

This case study focused on the use of Twitter and other forms of technology in the professional lives of two early career teachers who were introduced to multiple forms of technology in their preservice literacy course and later adopted some technology practices in their English classrooms. Each case description begins by discussing the focal teacher's use of Twitter and other forms of technology within a preservice teacher education course and follows up with these teachers in their early professional careers to further examine their professional uses of technology. Each teacher is positioned as an active agent who chose to use technology, strategically, within two distinct social settings (Lasky, 2005): the preservice classroom (as a TC), and the secondary classroom (as a teacher). While both teachers used Twitter and other forms of technology for various purposes in each setting, these uses were examined with respect to initial and subsequent personal dispositions, defined as behaviors exhibited and attitudes held (Shoffner et al., 2014), toward technology use, in both settings.

Preservice Course Context

Both focal participants took my content area literacy course as part of a postbaccalaureate single subject credential program at a large public university on the West Coast. The literacy course drew from students in multiple disciplines and focused primarily on

strategies that could support literacy development across the curriculum at the secondary level. Twitter registration was a requirement of my course section, and students received, through lecture, information on the purposeful use of Twitter during the course for reasons such as regular access to the professor; access to teaching resources; micro-blogging one's thoughts, and connections with other professionals.

While Twitter registration was required of TCs in this course, regular use of Twitter was not monitored, and students chose their own levels of participation. TCs had the option to make their Twitter accounts public or private, as long as they followed their classmates and the professor, but were encouraged to have public accounts during the course to encourage greater professional networking opportunities.

This course also included a specific session focused on 21st-century literacies that introduced multiple application ("app") based tools for the classroom, ways to use technology in professional learning outside of the classroom, and social media resource tools in addition to Twitter (e.g., using safer closed social media platforms like Haiku, Edmodo, or Google classroom to promote interaction in the classroom or collecting resources by pinning on a Pinterest board). All students engaged with exploration of apps, in disciplinary pairs or small groups during this course session and were asked to share one specific tool they might use in their future classroom.

Finally, all candidates in the course completed a 21st-century literacy project based on technology integration. Project choices included the creation of a digital story, participation in a Twitter chat (with a Storify archive and a reflection), and authoring a professional blog. (Storify [<http://storify.com>] is a cloud-based, social network service platform that allows users to search for and collect posts from various social media sites, including Twitter, related to particular topics using hashtags or topics. It is often used to archive Twitterchat discussions.) Candidates could choose any of the three choices, with the goal of the project being to engage with technology as both a learner and a professional.

Setting a Space for Technology Integration and Exploration

As the instructor of the recruitment course, I chose to integrate technology into the course to provide a model for teacher candidates consistent with the five International Society for Technology in Education (ISTE, 2008) teacher standards that were active during the time of the course. I set up an environment of digital age learning experiences and assessments through requiring students to register for Twitter and through regular communication and resource sharing via the course learning management system (e.g., weekly e-mail updates, posting the syllabus, all course lecture PowerPoint electronic slides and assignments online with no printed copies distributed in class). The course also included the aforementioned required assessment to engage students with 21st century literacy practices, and course session devoted to digital literacy and technology integration in the classroom that devoted class time to exploration of technology tools in context.

Outside of class, I also regularly used Twitter to interact with current and former credential students, both publicly and through the private message feature; used Twitter professionally to share resources; followed and tweeted using class hashtags; participated in educationally related Twitter chats; and live-tweeted professional events, posting from various conferences and talks, as a form of archival notetaking. Through these efforts, I sought to provide opportunities for engagement and model the benefits of technology use in and outside of the classroom to support professional work in education, but I recognized that TCs, as active agents, might choose to take up such opportunities in a variety of ways or might only engage in a limited way according to the requirements of the course.

In designing the 21st-century literacy choice project, I set a goal for active TC engagement in a form of technological literacy that could support the development of their professional practice at different levels of the SAMR (substitution, augmentation, modification, redefinition) framework (Puentedura, 2010). In providing a choice of three different technology based options, TCs could use either (a) social media tools for facilitated professional connections and networking around a chosen topic with a secondary focus on reflection (Twitterchat and storify option); (b) software tools (iMovie, Powerpoint, or Windows Media Maker) to create a content-related digital video (digital story option); or (c) the integrated learning management system (LMS) blogging platform for professional reflection and interaction (blogging option). The blogging and Twitterchat options were conceptualized to promote engagement with technology that was professionally related, but not necessarily classroom centered, whereas the digital story option was designed to incorporate the use of a technology-based platform that could be more directly transferred to TC classroom practice.

Each option also required different forms and levels of technological literacies. Puentedura's (2010) SAMR model identified four levels of technology use by educators: substitution, in which technology acts as a direct tool substitute with no functional change; augmentation, in which technology also is a direct tool substitute with some functional improvement; modification, in which technology allows for significant task redesign; and redefinition, in which technology allows for the creation of new tasks that were previously inconceivable.

The blogging option was an example of augmentation, in which the blogging feature, an embedded widget in the university LMS, acted as a technology-based substitute for a reflective journal entry. It functionally improved a reflective journal by allowing for more public interaction, but was more of an enhancement of this type of assignment than transformational. The digital story was an example of modification, in which multiple images, recorded voice (storytelling), and narrative created a significantly different product than an in-person electronic slide presentation or a text-based narrative. The multimodality and complexity of integrating transitions and multiple layers of technology-based skills in the creation of the digital story made it a complex option for TCs, but it appealed to TCs who sought to create a tool they might be able to use in their future classrooms.

Finally, the Twitterchat and Storify reflection was an example of redefinition in allowing preservice TCs to connect virtually with a network of educators around a common topic from the comfort of their own homes through the use of a twitter hashtag at a given time. This option, while seemingly simpler in technological complexity than the digital story, required TCs to be comfortable with the use of hashtags, the format of a Twitter chat (which often includes multiple simultaneous conversations), and the curation of tweets using a second platform (Storify). It provided TCs the opportunity to engage actively in personalized professional development that prior to the advent of Twitter would have been impossible.

In choosing to integrate technology in these ways within the preservice course, I intentionally modeled positive dispositions toward technology in classroom spaces, particularly demonstrating how Twitter could be used as a social media tool for instruction, resource sharing, and establishing professional connections in and beyond the teacher education classroom and providing opportunities for students to engage actively with technology in professional spaces. The focal cases demonstrate how two teachers developed their own uses of Twitter and technology over time, in distinct, but important ways, connected to dispositional qualities indicated in their preservice use of technology.

Participants

The focal participants were both full-time secondary English teachers at the time of the study. Following the credential program, Mal obtained a high school position, and Heather became a middle school teacher, both within the region where they obtained their credentials. Heather taught in a more affluent suburban district with a reputation for higher performing students, whereas Mal taught in an urban-suburban district with a high population of socio-economically disadvantaged students and a district emphasis on technology as part of college and career readiness initiatives. Heather was in her third year of full-time teaching during the time of this study, whereas Mal was beginning her second year of full-time teaching.

The selection of case study participants was done from a larger pool of students, recruited based on the following criteria: (a) currently teaching full time in an English classroom; (b) some activity on course-related Twitter accounts since their time in the course; (c) former students in the literacy course; (d) demonstrated an interest in ongoing incorporation of technology into their professional practice at the end of the preservice course.

Recruitment occurred through Twitter. Individuals who fit the selection criteria were sent a private message and invited to participate in a short follow-up survey administered through Qualtrics that asked about their uses of technology and Twitter in their preservice coursework and in their professional work since leaving the course. Prospective participants completed the survey and engaged in brief follow-up online interviews with me through Twitter.

The focal participants were chosen to examine individual and cross-case themes related to technology integration across various contexts. While Twitter was the primary recruitment tool and use of Twitter was part of the recruitment criteria, both focal participants also mentioned and exhibited other forms of technology use both in the preservice course and in their professional practice.

Table 1
Uses of Technology by Focal Participants

Participant	Preservice (Observed)	Student Teaching (Observed through Twitter)	Teaching Practice (Self-Reported)
Mal	Twitter (in-class & for Twitterchats), Storify, University LMS Discussion Boards, Dropbox	Twitter (for Twitterchats)	Twitter (for Twitterchats and to connect with administrators), 1:1 laptops used for word processing, building presentations, video instructions, and test taking; communicating with parents and students, EdPuzzle
Heather	Twitter (in-class), Digital Story creation, University LMS Discussion Boards, Dropbox	No Technology Use Observed or Reported	Twitter (for resources from other educators), Chromebooks, Storyboardthat.com, Peardeck,

Data Sources

As noted, Twitter registration was a required part of the preservice teacher education course from which both focal teachers were recruited; however, use was not tracked or required during the course itself, and candidate use of Twitter as a tool varied heavily in the larger course from which participants were drawn. For this study, active participant use of Twitter (in the form of tweets, likes, and personal messages) was tracked from the establishment of each focal teacher's Twitter account until fall 2016 (3 years for Heather; 2 years for Mal).

Additionally, the patterns of each focal teacher's participation were triangulated with self-reports of how Twitter and other forms of technology were used in the classroom and outside of the classroom in professional work (see Table 1). Candidates' 21st-century literacy choice assignments, Mal's Twitterchat reflection and Heather's digital story, were also central data sources to give a clearer picture of preservice dispositions and engagement with technology in the context of the literacy course.

Additional data sources examined and used for purposes of triangulation included candidates' final course reflections (preservice dispositions); candidates' responses to a short survey about technology use distributed to them in the fall 2016 semester (teaching dispositions and competencies); follow-up online interviews (teaching dispositions and competencies) after the survey completion, and personal online communications with me, as applicable – for example, e-mail, Twitter or Facebook messages (preservice and teaching dispositions).

Data Analysis

Once participants were chosen for the study, I completed data analysis using a combination of qualitative thematic coding cycles (Saldaña, 2013) and netnographic (Kozinets, 2015) methodologies to examine candidates' Twitter participation during and following a one-semester secondary content area literacy course. Netnography is a methodology based on combining ethnographic principles of analysis in technological spaces, particularly in relation to social media and social networking analysis. Kozinets (2015) described key elements of data analysis in relation to this type of work as telling the story behind the data by looking not only at the individual utterances (or tweets, in this case) made by study participants (the disparate parts), but the contexts and networks within which these interactions took place (the cohesive whole) and the affordances and connections that the networked environment allows for those who use it.

An initial open descriptive coding cycle, followed by an axial coding cycle (Saldaña, 2013) were used to establish and refine themes within individual participant data sets and among the two participants. In order to establish themes, candidates' individual data sets were first examined longitudinally from the establishment of the account (3 years for Mal; 4 years for Heather) to discern attitudes toward technology during the course and the ways in which visible usage of technology via Twitter seemed to corroborate or differ from the perspectives expressed during the course. Reflections (during and at the end of the preservice course), surveys (during teaching practice) and personal communication about technology (longitudinally) were analyzed to see if attitudes toward technology and expressed usage of technology (beyond Twitter) reflected similar themes over time. After looking at each candidate individually, data sources were looked at across the two participants to determine cross-candidate themes related to reported and visible usage of Twitter and other technology tools in the data set.

Netnographic perspectives were helpful at the within-participant and cross-participants stages of data analysis by pushing me to look beyond individual tweets to the contexts in which these tweets might signify membership or belonging to particular networks. The netnographic framework prompted me to look not only at tweets from the participants, but also those tweets which participants liked and the number and nature of who participants followed on Twitter. While this information still did not tell the whole story of participants' usage of Twitter (since there is no public data related to articles clicked on and read), it added a more nuanced layer of understanding to participants' publically available Twitter presence, particularly when triangulated with participants' other data sources.

The combination of thematic and netnographic approaches to the data helped to examine usage in ways that connected mainly with *professional dispositions* toward technology use and each teacher's individual journey toward actively using technology in her classroom.

Table 2
Data Analysis Table by Coding Cycles

Coding Cycle	Method	Purpose	Data Analyzed
Cycle 1	Open Descriptive Coding	Memos that indicate teacher dispositions (attitudes, beliefs) and actions in relation to technology	Tweets & Twitter messages; literacy choice assignments; course reflections; survey responses; personal communication (By Participant)
Cycle 2/3	Axial Coding	Establish and refine themes	Tweets & Twitter messages; literacy choice assignments; course reflections; survey responses; personal communication (By Participant then across participants)
Cycle 4	Coding using Netnographic framework	Confirm and refine themes using additional data sources	Twitter likes and follows, nature of tweets (using (#) hashtags/ (@) direct tweets), frequency of tweets, privacy setting choices

Results

Mal: Moving Toward Technology as Community in a Public Space

Mal initially struggled with how to use Twitter as a tool for professional development. Although she dutifully established a Twitter account and followed her colleagues and me, she chose to keep her account private, meaning that only those she had approved as followers could see her tweets. Her privacy settings (as well as the chat environment itself) proved problematic when she first engaged in a Twitterchat for her 21st-century literacy choice assignment:

I was overwhelmed at how fast teachers were tweeting. I sent my introduction tweet and responded to a few other tweets, but I had no replies. I also was not able to contribute to the chat, because I lacked experience as a teacher in the classroom. I felt frustrated that I wasn't able to communicate with anyone. (Twitterchat reflection, 4/16/15, lines 21-24)

Mal's first Twitterchat experience was both overwhelming and frustrating. She expressed concern that her lack of experience meant that she could not contribute to the conversation, and she felt unable to make connections during the chat. While she did gain resources during the chat, she left feeling somewhat disempowered and ignored. She contacted me after the chat, upon finding that she could not add her own tweets via Storify after searching the chat hashtag. We engaged in some troubleshooting and realized that her privacy settings prevented those in the chat from seeing her tweets. I told her that she would still receive full credit for the assignment and that this problem occurred from time to time in the class.

Mal, however, was determined to explore Twitterchats as a tool for professional development. She persisted and participated in a second Twitterchat during the course, one in which she both engaged and created a second, personal hashtag to help her find her tweets more easily and organize them using Storify. The use of Storify to archive the chat helped Mal reflect on her process after the chat and the relationship between Twitterchats and her own professional growth:

I think Storify made the connection of literacy and Twitter chatting because it represents how I am able to read and respond to content. My responses should demonstrate my ability to understand what other educators are asking or replying to, and Twitter is one way of assessing my literacy for content and technology use.... I have slowly understood how Twitter can be used in the classroom as well as a tool for professional growth, and I will most likely use it for professional growth, since it has provided me with articles for resources, and support from teachers all over the country at any time of the day. (Twitterchat reflection, 4/16/15, lines 46-56)

Mal used Storify as a tool to clarify the threads of conversation that occurred during Twitterchats and to think about her own literate practices as part of the chat. She noted that her evolving understanding of Twitter allowed her to think about ways that she could grow, gain resources, and get support from teachers "all over the country at any time of the day." Mal's second Twitterchat provided an opening to engage in professional community and promote her own professional growth. While she initially stated she was *likely* to use Twitterchats again, she ended her reflection by noting, "I will use Twitter chats often, and this time around I can pay more attention to the conversations than learning how to use Twitter." (Twitterchat reflection, 4/16/15, lines 63-64)

Mal's persistence with the Twitterchat process during the course indicated a developing disposition toward engagement in a professional community via social media. While she was assured course credit for the assignment and did gain some resources from her first chat, her larger goal was to learn the concept of the chat as a professional tool (Twitterchat reflection, 4/16/15, lines 57-63) and to actually be seen by and to interact with fellow professionals (Twitterchat reflection, 4/16/15, lines 21-24; 28-29).

This goal of recognition and active participation in a professional community extended beyond her preservice course into her professional practice. As Mal entered the classroom, she continued to participate in Twitterchats, engaging in one during her student teaching semester and another during her first year of practice. As a teacher, she also tweeted to introduce colleagues to the process of Twitter chatting. Mal reported using other forms of technology in her classroom, as well, in both traditional (e.g., word processing, presentations, and test taking) and less traditional ways (e.g., video instructions and as a tool of communication with students and parents; Survey response, 1/31/17). However, one of the most interesting and unique ways in which Mal used technology was "sharing what is happening in my classroom with administrators" (Survey response, 1/31/17).

In our preservice course, I regularly used our classroom hashtag and photos of classroom activities to make our work public. Mal paralleled this practice, particularly in relation to the use of technology in her classroom. She would tweet examples of students using technology for various projects that eventually gained recognition by her school administration. In a private conversation during her first year of teaching, which she initiated, she excitedly reported to me,

The principal recommended me to the city [I teach in] when they wanted to film students in the classroom using the new laptops. Twitter has been helping me a lot because admin and all the other people at the district know what I am doing with this new technology. (Facebook message, 10/29/16).

Mal, even in her first-year of teaching, was being nominated as an example of a teacher integrating technology effectively in her classroom. She attributed this recognition to her digital presence, using Twitter in a district where administrators also used and valued the use of Twitter as a way to demonstrate technological competence and to highlight strong practice.

Mal's tweets from the classroom highlight her use of other forms of technology in her classroom instruction. Mal tweeted pictures of her students using laptops in groups to do research for a philosophical chairs discussion (Tweet: 11/1/16) and named specific tools, like Edpuzzle (<https://edpuzzle.com>), that students use to learn about claims and counterclaims (Tweet: 10/26/16), using hashtags (with her district and site abbreviation as well as popular hashtags like #edtech #blendedlearning, and #ntchat [new teacher chat]) to engage larger communities.

Mal also used Twitter as a teacher to highlight school and district events. She retweeted her principal, her site drama department, and her district administration, as well as posting pictures of clubs she advised and activities she participated in at school. These tweets indicated a continued, open engagement and positive disposition toward technology and may have additionally indicated Mal's desire to be a part of her school site community; her desire to be continue to be recognized for her technology use by site and district administration; and her desire to use Twitter (and other forms of technology) in more public ways.

Heather: Seeing Possibilities; Searching for Authenticity

Heather's disposition toward technology manifested in different ways in the course. Heather established her Twitter account as public and tweeted a few times in response to class prompts (where TCs could write or tweet their responses). However, she did not appear to be an active user of Twitter outside of the course itself.

For her literacy-choice project, Heather designed a digital story on simile and metaphor. In her digital story, she introduced the concepts of simile and metaphor using voice and images to illustrate the descriptive nature of the figurative language examples from poetry. Her success at creating her digital story was a source of pride for Heather, who stated in a personal communication with me,

[The digital story] was actually really fun to make, and I love thinking that I could show a video that I actually made to a class one day!! I am glad I chose to do this assignment and challenge myself to try something new. (E-mail communication 11/27/13)

Heather's reflection on her success with the project and the future use of her digital story in her classroom indicated the possibility that she saw in using digital forms of text as an instructional tool in her classroom. Her satisfaction at having chosen an option for the assignment that challenged her to try something new alluded to some possible uncertainty in relation to her initial choice, but her eventual satisfaction at her finished product and the possible use of it in her practice. Heather's experience with the project indicated a disposition of enthusiasm to integrate technology with authentic classroom value, despite some possible initial challenges at trying something new.

This disposition of cautious optimism toward technology was also reflected in Heather's final reflection for the course, where she discussed her perspectives on social media. Heather stated that she saw the possibilities of social media to promote interaction, was nervous about its use, but recognized the importance of helping students succeed in a world of growing technological demand. Her final reflection conveyed a sense of the necessary challenge of pushing forward to integrate 21st-century literacies to support her students:

In my literacy autobiography I wrote, "Learning in general can be messy, but I've found that when I approach learning something new, like I did when learning to ride a bike, willing to face bruises and bloody knees to conquer the beast, I come out on the other side more satisfied with myself and with my understanding," and I hope I always feel this way. 21st century literacy gives us the opportunity to connect to one another in ways like never before. 21st century literacy invites discussion. On social media sites, including YouTube and blogs, anyone can produce a message that can be seen by thousands of people. I have trepidation about entering what feels like a whole new world where my ideas are shared and commented on by others, but as a teacher, I must help students navigate this world because it is here to stay. (Final Reflection, 12/10/13, lines 38-47)

Heather positioned herself both as a learner who might encounter challenges in interacting within 21st-century literacy contexts and as a teacher who must confront her own concerns about navigating social media in order to support her students to engage in these digital spheres. Her specific mention of social media as a forum for increased public discussion and scrutiny juxtaposed with the imagery of being bruised and bloodied, having conquered the beast, indicated the struggle of this type of learning for Heather. Heather recognized that technology and social media are important contexts that are "here to stay" and that part of her professional responsibility is to guide her students through this "whole new world," but she also expressed clear concern about her own engagement and public presence.

Heather's sense of cautious enthusiasm at using technology for multimodal expression continued into her practice. In a survey response during her second year in the classroom, Heather said,

I am always looking for ways to have students not just use technology but to really take ownership with what they create with the technology. We just did a book report, and students were given choice on how to present the info. Students made a wide variety of videos. I showed them websites like Storyboardthat.com where they could make creative presentations that incorporated the technology. (Survey response, 1/30/17)

Heather began her discussion of how she used technology in the classroom by noting that her goal was not only for technology integration, but for student ownership of the products created through technological tools. In Heather's example from her classroom, she cited how she effectively used digital tools to help students create new products that show

creativity and innovation in relation to their knowledge about books. She took a traditional book report and allowed students to present in video format and creatively present their knowledge about their chosen text. In doing so, Heather provided opportunities for engagement in the new world of digital media, similar to the ways in which she experienced making a creative presentation of her knowledge in the digital story. Her survey response indicated growing confidence and pedagogical rationale for her technology integration in the classroom.

Heather's final reflection for the course, follow-up survey response about Twitter usage and personal correspondence also indicated that Heather was finding value in Twitter connections outside of the classroom. In her final reflection for the course, Heather again noted the positive challenges that she experienced in the class that pushed her to engage with professional community, specifically noting how social media sites provide opportunities for connection with other educators:

I was challenged by the use of technology in this class. In this class, more than any other I have taken at CSULB, we were encouraged to get involved in the discussions and interactions among professionals in the field. This interaction is so important to me because I believe in the importance of learning from many people and listening to the viewpoints of those who have expertise in my field. Social media sites provide ways to connect to other educators. (Final reflection, 12/10/13, lines 25-29)

In her follow-up survey, Heather further stated that she used Twitter as a place to find resources, engage in professional development, form and maintain professional community, avoid isolation as a teacher, and keep in touch with the researcher, showing her engagement with Twitter as a tool for professional development similar to her assertions from her time leaving the course. When asked about the greatest value in using Twitter professionally, Heather stated, "Because links are often embedded in posts, I can access information quickly. I read many articles from educators I admire (Survey response, 1/30/17)." This response indicated that Heather perceived Twitter as a place where she could find resources from other educators that were valuable for her practice in a quick and accessible way.

What was particularly interesting in Heather's case was that, although her self-reports of Twitter use and value aligned with her general disposition of cautious but positive engagement with technology during the course, her affect would not have been evident simply by looking at Heather's observable participation on Twitter. In fact, examining Heather's social media presence on Twitter, with only 37 tweets/ retweets (or posts) and four liked (or saved) tweets, it may have seemed as if Heather was not actively using Twitter as a tool for professional development or professional engagement.

She reported multiple times, however, that she used Twitter for a variety of purposes. In addition to reading articles from mentor educators, she also stated that she used Twitter as a place to avoid isolation and maintain professional community. While Heather's observable Twitter activity indicated that she might not see Twitter as a place to share regularly about her practice or as an interactive space, she reported still using Twitter as a space where she felt connected to other educators.

Discussion and Implications

In their course final reflections, many TCs, including Mal and Heather, often note how they had never previously considered the role of technology in their classrooms, but that they

are now open to integrating more technology in their future practice. While these statements are promising, they are also provided in a graded reflection. To investigate these stated dispositions further, this study followed the focal participants beyond the course and the credential program into their classrooms, to examine how these teachers' dispositions and practices evolved in their own professional journeys.

Both candidates reported finding value in Twitter and technology integration in various ways in their professional practice. In examining their cases, both noted that using Twitter to gain access to resources and connect with professionals in the field was critical for them and could be of value for teachers more generally. However, the ways in which they engaged on Twitter evolved in somewhat opposite directions.

At the beginning of the course, Heather established a public account and used it to tweet several times in class, trying out the platform for engagement in a specific given context. Heather eventually stopped tweeting, during the course and only tweeted original tweets four times after the course. While she did not explain why she stopped tweeting, she did state that using hashtags was awkward for her, and she expressed at multiple times the challenge of (and her concerns with) engaging in social media as a public forum.

In contrast, Mal initially chose to make a private Twitter account, which limited her ability to engage with other educators outside of an approved circle of followers. However, when Mal made her account public, she began to engage with other educators during Twitterchats during the preservice course, then continued participating in Twitterchats during her student teaching practicum and her first year of teaching.

Instead of tweeting, Heather reported using Twitter to gain resources and avoid isolation through reading the ideas of educators she admired. While she reported using Twitter in these ways, there was no observable indication of this type of participation. Using Twitter as a receptive source of information, as Heather's conflicting self-reports and Twitter presence may indicate, is common among Twitter users, as 44% of all Twitter users never tweet even once after establishing their Twitter accounts (Sherman, 2014). This type of use of social media tools, like Twitter, to gain resources and stay current with education could be easily hidden (even using netnographic methodologies) if not specifically asked about through other means.

Mal also reported using Twitter to avoid isolation and gain resources, but did so through more direct interactions with educators in various networks. Initially, she did so through participating in multiple Twitterchats herself. Eventually, Mal introduced Twitterchats to teacher colleagues. Mal also used her tweets to make her practice more public, noting when students in her class were using various technology tools; tweeting from school events; tweeting from other professional development events; and retweeting posts from other educators or organizations at her site.

While both teachers expressed overall positive dispositions toward technology use generally and Twitter specifically. Both also faced challenges in their engagement with technology. Mal's initial frustrations with her first Twitterchat experience centered around not being seen, acknowledged, and interacted with during the conversation. While she, at first, attributed this to her lack of experience in the classroom, she eventually realized that her privacy settings made her tweets invisible to other participants (Twitterchat reflection 4/16/15). Her subsequent participation in Twitterchats allowed her to experience a greater sense of professional engagement (Twitterchat reflection 4/16/15).

Her tweet to introduce her colleague to Twitterchats allowed her to share this professional development tool (which she had found value in) with others, positioning her as an expert in this area where she had initially felt completely overwhelmed. Mal received further validation for her use of Twitter through recognition by the administration and nomination to be featured as a demonstration teacher with the districtwide technology initiative. Despite her initial challenges, Mal's continued use of Twitter led to positive online and in-person engagement that led to an eventual enthusiasm for Twitter as a public, professional tool.

Heather's challenges stemmed from her struggle to negotiate authentic uses for technology in her professional practice. Heather stated from the beginning of the course (in her literacy autobiography) and in her final reflection for the course that the technology components of the course were challenging; however, she demonstrated a willingness to engage with and explore various technologies in the course.

Heather tweeted in response to classroom prompts or to extend classroom discussion during the literacy class and designed her digital story for the literacy choice project. In reviewing her tweets, I noted, however, that her original tweets received few retweets or likes, and aside from those tagging me, she rarely directed tweets toward specific users (the simplest ways to engage interaction). Because of this approach, Heather may not have experienced a sense of interactive professional community when she took the risk of putting her ideas forward via Twitter in a classroom space. In contrast to the lack of response that Heather received to her tweets, after watching and evaluating her digital story I asked Heather if I could use her story as an exemplar in future classrooms. This recognition may have helped Heather to feel more confident in the product that she produced.

Although using different media tools in the process, Heather brought a use of technology that she felt proud of, creating a digital story, into her classroom practice with her students, empowering students with creation through technology. In her classroom, Heather's examples of using a story-boarding app allowed students to take ownership of expressing their knowledge through creatively using technology (Survey response 1/30/17).

The disposition of technology as a tool for authentic expression seemed to be a core value for Heather. When she used tools in this way to produce digital video type projects, in her preservice course and in her own classroom, she had direct positive feedback from me, as her instructor, during the course on the product she produced; she found this specific product (her class-created digital story) to be a tool she might actually use in her classroom; and she eventually received positive feedback and results from students in her classroom through the production of their reports in creative ways. These multiple positive experiences may have contributed to her feeling empowered in the authentic use of technology tools to support student growth in the classroom.

While being seen and recognized may have had important implications for both teachers, this recognition seemed only to reinforce more core commitments for each teacher. For Mal, she appreciated the affordances Twitter gave her to engage directly with other professionals, in her community and around the world, in a variety of ways. By making her other uses of technology public through Twitter, she received recognition at her site and from her district which may have strengthened her general commitment to technology use.

For Heather, finding and using technology tools to supplement and enhance teaching and learning proved empowering both for herself as a learner and as a teacher. This empowerment was seen in her digital story for the course and her later use of apps like

Peardeck and Storyboardthat.com to help support her students' presentation of traditional informational or report-based texts.

In this study, the focal teachers discussed experiences with technology in my preservice course as a model or motivator that helped them to consider the roles of technology in their subsequent professional practice. Introducing TCs to a variety technological tools early in their professional formation; modeling various uses of these tools in professional settings; continuing to use these tools to connect as they move into their classrooms; and validating technology use are ways that teacher educators can support the development of varied and authentic technology use among future teachers.

Teacher educators can also recognize the importance of authentic interactions and feedback on promoting continued use of digital tools. As TCs take risks with technology in their preservice programs, it is important for teacher educators committed to promoting technology development to encourage and support these candidates' efforts. It is also important, though, that teacher educators work to promote greater critical consciousness and intentional understandings of TC choices to use Twitter, social media, and other forms of technology (or not to use such tools) as part of professional practice. A failure to promote critical reflection on such choices leaves fewer opportunities to encourage dispositional shifts or dispositional development in relation to TC practice with technology.

The integration of technology into the teacher education classroom is not without additional challenges. This study indicates that response and validation are critical to supporting the development of positive new technology dispositions. Yet, the integration of nontraditional assignments requires extra time investment in design and grading, as well as in troubleshooting potential technology snafus, like those of privacy settings or creating, editing, and submitting large movie files.

Additionally, responses that go beyond simple retweets to actually engage TCs in meaningful interaction may become burdensome in relation to teacher educator time and may be difficult to sustain. Without these assignments and interactions, however, it may be less likely that TCs will have enough meaningful, structured opportunities for engagement with professional technology to negotiate the inherent challenges in learning new 21st-century discourses and to develop positive dispositions toward technology that will transfer to their professional practice.

While the challenges of integration in teacher education are real, it is perhaps a reality that 21st-century students must develop greater competencies with digital literacies and an understanding of how to use social media and technology productively in their academic and social lives. In order to prepare students to develop these competencies, teachers (and TCs) need meaningful, guided opportunities to engage with technology including social media, to negotiate their own personal challenges, and to find ways in which technology (designed for classroom, professional, and personal use) can be empowering tools for their professional practice.

Social media, like Twitter, can provide one powerful outlet for gaining pedagogical resources and engaging with other professionals. Digital tools can amplify the engagement of students with traditional assignments and support community connections with classroom learning. These two examples of engaged use of technology in secondary English teachers' professional practice show the possibilities that early professional technology engagement can bring to English classrooms.

Teacher educators can play a critical role in introducing teacher candidates to various forms of technology, and supporting them to develop and enhance positive dispositions toward technology as a professional tool. By modeling, empowering, and supporting teacher candidates to make authentic choices for technology use as part of their professional practice, teacher educators can be the change we wish to see in future K-12 classrooms, as candidates develop into teachers who empower and educate their students for a whole new world in the 21st century.

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