Integrating New Literacies in Higher Education:
A Self-Study of the Use of Twitter in an Education Course

By Julie Nicholson & Tomás Galguera

As the Internet is increasingly becoming *the* defining technology for literacy and learning with the majority of the world expected to be online in the next fifteen years (Leu et al, 2011), developing skills, knowledge, and dispositions to engage in the new literacies of the Internet are essential for successful engagement in education, work, and democratic participation (Coiro, Knobel, Lankshear, & Leu, 2008; Leu, O'Byrne, Zawilinski, McVerry, & Everett-Cacopardo, 2009). As new forms of communication and information use are continuously emerging with the expansion of the Internet and other information and communication technologies (ICTs)—e.g., blogs, video editors, presentation software, bulletin boards, avatars, virtual worlds, social networks, Google docs, and more—individuals will need to keep pace with the successive literacies necessary to effectively engage with these technologies (Coiro, 2003; Kinzer & Leander, 2003; Lankshear & Knobel, 2003; Smolin & Lawless, 2003). In this context, preparing students to become proficient participants in online, networked environments has been heralded as one of the most pressing challenges for education in the 21st century (Leu, Kinzer, Coiro, & Cammack, 2004).

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Despite this urgency, conservative educational practices remain the mainstay in higher education (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012), with very few faculty integrating new literacies or contemporary technologies, including social networking sites (SNSs), in their practice (Ajjan & Hartshorne, 2008; Coddington, 2010; JISC, 2008; Moran, Seaman, & Tinti-Kane 2011; Poore, 2011). The consequences of this schism are significant as confidence and facility with the literacies of the Internet and ICTs are soon to be "important determinant(s) of an engaged life in an online age" (Leu et al, 2011, p. 5).

The objective of this self-study is to expand the emerging scholarship on meaningful integration and scaffolding of SNSs and the new literacies requisite for their effective use in higher education environments. As a teacher educator, the first author describes the successes and challenges she experienced introducing Twitter into her college classroom. By outlining students' diverse reactions and the range of discoveries they made in learning to use Twitter for professional purposes, this study highlights the potential benefits and complexities associated with successful integration of social networking and new literacies in higher education environments.

Literature Review

New Literacies

Traditional literacies, defined by the use of paper, pencils, and books, have been increasingly broadened to include new literacies (Leu, Kinzer, Coiro, & Cammack, 2004) required for successful marshaling and use of information from the Internet and an ever-expanding range of ICTs. Leu et al. (2004) identified several principles characterizing a new literacies perspective, including the centrality of the Internet and ICT technologies and the need for individuals to develop additional literacies to use these technologies to their potential. New literacies are understood to be deictic (Leu et al., 2011), dynamically changing at the rapid pace of technological advancement, and reflexively linked with technology as the forms and functions of literacy and technology are continuously changed by the other (Reinking, 1998). Meaning within new literacies is represented across a multiplicity of media formats extending beyond print and two-dimensional graphics to include such forms as audio and video, photographs, icons, animated symbols, and diverse combinations of colors, fonts, and point sizes (Lemke, 1998). New literacies demand new forms of critical thinking and strategic knowledge as the panoply of unfiltered information on the Internet demands new higher order thinking skills in locating, evaluating, and managing a vast information stream (Muspratt, Luke, & Freebody, 1998). Additionally, new digital literacies privilege speed in the processing of information and social interactions, collaboration in learning, and co-construction of knowledge (Leu et al., 2004).

Developing skills and knowledge associated with the range of digital literacies is increasingly essential for individuals' social participation in a diverse range of social, cultural, political, and economic practices in communities (Bittman, Rutherford, Brown,

& Unsworth, 2011; Hague & Williamson, 2009; Lankshear & Knobel, 2003). Scholars are beginning to define the practices, skills, strategies and dispositions—distinct from offline literacy experiences—required for successful engagement with digital literacies (Leu et al, 2011). These include knowing how to compose a question or frame a problem to guide the search for information; understanding how to efficiently search and locate information related to one's questions or problem (Guinee, Eagleton, & Hall, 2003); having facility in evaluating the level of accuracy, reliability and bias associated with information (Fabos, 2008); synthesizing multimedia information from multiple sources (Jenkins, 2006); and understanding how to communicate with others through the context of the Internet to request information, co-construct ideas, and share knowledge and the products of one's learning process (Leu et al., 2011).

The complex skills, knowledge, and dispositions for success with new literacies represent a continuum spanning content consumption, content creation, and the evolving art of content curation necessary to locate and organize information and then choose the most effective format for sharing it with an intended audience (Rosenbaum, 2012). A report released by the Pew Research Center (Lenhart, Purcell, Smith, & Zickuhr, 2010) highlights that the majority of teens and a growing percentage of adults are content creators, developing original content for the Internet, through sharing self-created content (e.g., photos, videos, stories, and artwork), combining it into creative new content, blogging, creating websites, and/or posting comments online. As future success in school and the workplace will demand skills with content creation and curation, concerns about the consequences resulting for those whose participation remains confined to the level of consumption of information are growing (Jenkins, Clinton, Purushotma, Robinson, & Weigel, 2006).

New Literacies and the Enduring Digital Divide

Concerns persist about inequitable gaps between individuals advantaged by technology and those, often the least privileged in society, further marginalized by their limited capacity to consume or produce information and content (Cuban, Kirkpatrick, & Peck, 2001; NCES, 2003a/b; Valadez & Duran, 2007). Although historical discussions of the digital divide described an oversimplified binary between technology haves and have-nots, we now possess a better understanding of the complexity of the divide and factors that contribute to it (Modarres, 2011). For example, DiMaggio and Hargittai (2001) argue for shifting attention away from dichotomous measures of access to and use of new technologies, to recognition of digital inequalities in equipment, autonomy of use, specialized skills, social supports, and the purposes for which the technology is employed. Their work highlights the significance of the social aspects of technology usage resulting in stark contrasts in access to peer networks and social supports to learn innovative uses of the technology. To better understand the workings of the digital divide, Martin (2003) proposed three explanatory variables: motivation, possession, and skills. Motivation consists of individuals' willingness to use technology and to include it in their daily

interactions; possession represents individuals' physical access to technology; and skills include individuals' ability to use the technology and the support they enjoy to strengthen their facility with digital tools and environments.

Reinhart, Thomas, and Toriskie (2011) describe a two-tiered digital divide, extending the description of the Top-Level Digital Divide described by Hargittai (2002) reflecting divisions in access related to socioeconomic status, recognizing a Second-Level Digital Divide (SLDD) representing the inequitable division that exists between the intersection of technology and learning. While some individuals are able to take advantage of the full range of applications and research possibilities on the Internet (the 'content creators'), others are only provided access to the most rudimentary applications designed to engage only the lowest order thinking skills (Reinhart, Thomas, and Toriskie). Jung (2008) found that several factors influence the existence of the SLDD, including the technical environment, the range of goals and purposes individuals have when using technology, and the availability of technical support individuals have access to in their personal and professional networks to address technology oriented questions as they arise. As Warschauer (2003) contends, there are significant consequences for a society when only a privileged subset of individuals is able to utilize the Internet to participate and influence democratic processes.

New Literacy Integration into Higher Education

Conservative educational practices in academia have led to slow growth and integration of new literacies and digital technologies in higher education (Ajjan & Hartshorne, 2008; Coddington, 2010; JISC, 2008; Moran, Seaman, & Tinti-Kane 2011; Poore, 2011). Yet, new technologies can be transformative for learning, teaching and research among higher education faculty (Conole, 2011; Greenhow, Robelia, & Hughes, 2009; Oblinger, 2010; Veletsianos, 2012). Research suggests that college students' use of technologies in class has often been limited to "convenience and control" (Kennedy, Judd, Churchward, Gray, & Krause, 2006, p. 15) or administration and content delivery, but they have not become a context for substantive learning (JISC, 2008; Poore, 2011). Integration of new literacies and technologies into higher education is a complex endeavor as college students are widely divergent in their familiarity with and skills in using the digital tools of the "Net Generation" (Kennedy, Judd, Churchward, Gray, & Krause, 2008, p. 108) suggesting that the integration of ICTs into university curricula requires intentional differentiation and scaffolding (Galguera & Nicholson, 2010). Despite these complexities, students have reported their interest in seeing a greater integration of technologies (e.g., blogs, instant messaging, social networking, RSS feeds) into their university coursework (Kennedy, Judd, Churchward, Gray, & Krause, 2008). Scholars warn against assuming that students will transfer smoothly, from a social or entertainment technology, to "learning technologies" (Kennedy et al, 2008, p. 119).

Use of Twitter as Teaching Practice

Web 2.0 applications, and especially social networking tools (e.g., Facebook, Twitter) have enjoyed expansive growth in recent years (Fox, Zickuhr, & Smith, 2009; Smith & Brenner, 2012). Twitter, a free microblogging tool and social network website created in 2006, allows individuals to communicate through short messages, "tweets," of up to 140 characters in length. The most recent results from the Pew Research Center's Internet and American Life Project (Smith & Brenner, 2012) suggest that 15% of all adults online have used Twitter, and 8% report using it daily. Twice as many young adults (18-29 years) use Twitter as older adults, and individuals living in urban and suburban environments are more likely to use Twitter than those living in rural areas. The proportion of online adults who use Twitter on a typical day has quadrupled since late 2010 and doubled since May 2011. Increasing levels of smart phone usage partly explain these increases (Smith & Brenner, 2012). Still, college faculty are only beginning to use microblogging (Kassens-Nor, 2012), despite demand from students (Hannay & Gretwell, 2011) and expectations from prospective employers (Wankel, 2009; JISC, 2012).

Research has focused on the potential for Twitter to increase interactivity with students, motivate learners, support collaboration and expand the depth of students' participation (Ebner, Lienhardt, Rohs, & Meyer, 2010; Junco, Heibergert, & Loken, 2011; Schroeder, Minocha, & Schneider, 2010). Twitter can also have important applications in higher education. For example, Parry (2008) identified 13 ways in which Twitter could be used as an instant feedback tool during class, a live tweeting application that has many benefits including students' increased listening, attentiveness, and information gathering that supports more effective teacher-student communication (Wankel, 2009). The use of Twitter groups including only students within a particular class has been found to improve real time communication about class content (Richardson, 2009). Junco, Heibergert, and Loken (2011) found that Twitter use inspired college students to continue communicating about class content after class was over and strengthened students' relationships and communication with one another and their teacher.

In contrast, Kassens-Noor (2012) compared two groups, one using Twitter and another using in-class discussions and individual diaries for a class assignment, and found that the strict character limit on Twitter inhibited students' critical and reflective thinking. She explains, "tweets seem to defeat an essential attribute for active learning, because tweeters do not have 'space to think,' whereas the traditional teaching practices allowed for more in-depth thinking and self-reflective learning" (p. 16). However, Kassens-Noor (2012) also found that Twitter was more effective than traditional methods in supporting students' collaboration and co-construction of knowledge, inspiring students' continuing active engagement with subject matter beyond the classroom, and helping students to gather in-depth information for class assignments. Dunlap and Lowenthal (2009) found that students' use of Twitter supported their interactions with other professionals and helped them increase their

professional exposure. Finally, Wright (2010) found that Twitter reduced students' feelings of isolation and supported their sense of community, and although restricting their ability to explain their ideas, she reported that the strict character limit led her student teachers to focus and refine their reflective thinking in beneficial ways.

Although research on the use of Twitter in higher education is new, the emerging evidence suggests that, as with other technologies, its strengths and drawbacks are highly dependent upon related content, pedagogy, assignment, and specified learning goals connected with its use and the overall context. Twitter is particularly effective for bridging theory to practice by relating theoretical concepts to practical real-world applications, yet evidence suggests that critical and self-reflective thinking are better accomplished through traditional methods (Kassens-Noor, 2012).

Purpose of Study and Methodology

The current research was designed as a self-study (LaBoskey, 2004) to explore how Twitter could be meaningfully integrated into the first author's college classroom. The motivation for this effort emerged from the authors' preoccupation in their teaching practice to incorporate new literacies and address the inequities associated with the digital divide. The problem from which this self-study originated (LaBoskey, 2004) was dealing with the wide range of exposure, experience, and confidence the first author's students had in using digital environments while ensuring they learned about new literacies and the use of social networking tools. An additional challenge was the structure of the course, which met only once a month. Beyond her desire to strengthen students' digital literacy and remain connected with students, the first author hoped to increase students' engagement and participation, expand their professional exposure and collegial connections, strengthen their theory to practice connections, and improve their digital curational skills. Thus, the following questions guided this self-study:

• How does integration of Twitter into a higher education course support students in learning to participate in digital environments?

• What is the relationship between students' experience using Twitter and the instructor's pedagogical and curricular decisions? What lessons were learned?

Method

Setting and Participants

The context for this study was a graduate-level course titled "*Public Policy: Children, Youth and Family Issues*" involving 10 students. All were female and ranged in age between 25 and 60 years old; eight were White, one was Latina, and one was Asian. Seven students worked full time, in addition to being enrolled as full time graduate students, and represented various programs including special

education, leadership, early childhood, and infant mental health. An important goal of the course was to inspire students to become involved in policy discussions affecting their professional work in education and to learn how to gather up-to-date information about the most salient policy and legislative issues in education. Thus, the course introduced students to the wide range of local, state and federal policies, funding streams, governance structures and stakeholder groups influencing the services that exist for children and their families.

The policy course was taught in a blended format with face-to-face meetings on campus once per month and regular online interactions utilizing Edmodo (www.edmodo.com), a private online social platform for teachers and students to interact and share content. Twitter was introduced on the first day of class as an important social networking tool to help students maintain real-time updates on the critical policy and research issues in the field and to provide a platform for advocacy and coalition building.

During the first month, students in the class were required to set up a Twitter account (9 of the 10 students were new to Twitter) and to identify and follow key individuals and organizations engaged in policy, research, and advocacy on topics of interest to them. Months two through four, students were required to send tweets or re-tweet important professional information to their followers and to use a hashtag[1] or weblink whenever they composed original tweets. Students were also required to complete reflections at the end of each month on Edmodo where they discussed what they were learning about policy, research and advocacy and their reactions to Twitter.

Data Collection and Analysis

The data sources for the study include 10 tweets (100 total) and three reflections (30 total) from each student over the course of a 14-week semester. Data were coded inductively and deductively (Miles & Huberman, 1994; Strauss & Corbin, 2007), utilizing the benefits and limitations discussed in the literature (Dunlap & Lowenthal, 2009; Kassens-Noor, 2012). Relying on the student as the unit of analysis, we developed comparative case studies (Yin, 2003). For each case study, we examined the student's individual trajectory in learning to use Twitter. Therefore, we describe initial skill levels, unique discoveries and use over time, barriers, and end of semester beliefs about Twitter's strengths and drawbacks for their professional work. Each student's tweets were categorized as either original or retweets (i.e., forwarding others' tweets) and whether they contained weblinks or hastags. However, space constraints require us to focus on findings from the cross-case analyses.

Cross-case analyses were carried out to identify salient themes and recurrent patterns reflected across the data, revealing a general developmental pattern from observing to learn, to increased participation through exploration and discovery, to expanded risk-taking and attempts at interactivity and public engagement. We use this sequence as an organizing framework for reporting our findings below as we

summarize the students' evolving experiences with Twitter throughout the course. Examples were selected to represent the wide variability that existed within each of the main themes: functional uses of Twitter, benefits, and barriers.

An essential component of self-study is interactivity (LaBoskey, 2004), where collegial feedback mediates the limitations of singular analytic interpretations. The second author functioned as a critical friend (Elliot, 1985; Stenhouse, 1975), offering critiques of the primary author's analyses and suggestions for alternative interpretations of findings. The authors worked collaboratively to construct recommendations in an effort to "provoke, challenge and illuminate" (Bullough & Pinnegar, 2001, p. 20) field-wide questions of new literacy integration within higher education, while pinpointing approaches for improving the primary author's professional practice and course design.

Results

Learning to Participate with Twitter

What follows is a chronological description of the students' experiences in learning to use Twitter. The first month students primarily focused on learning the technical aspects of the tool and observing the process of interaction and knowledge sharing on Twitter. Month two led to more exploration and understanding of the different functional uses of the tool and more awareness of the challenges associated with its use. The final month inspired increased risk-taking in addition to students' strengthened awareness of the benefits and limitations Twitter offered for supporting their professional work.

Month 1: Learning Who and What to Follow

During the first month, students primarily focused on identifying individuals and organizations to follow, reading others' tweets and in some cases learning how to retweet information to their followers. The students' initial reactions to Twitter spanned the continuum from positive to very critical. Several students immediately identified Twitter as a valuable tool for connecting them with information that informed their professional development. As Alejandra states,

> I read about how many Latino children ages 3-5 years do not have access to quality preschool programs…It [Twitter] helps keep us as early childhood professionals up to date…with the fast paced lives that many of us lead in the Bay Area, Twitter can always give us quick information.

Similarly, Lien who described herself as originally 'skeptical' of social networks, found Twitter as a good way to "stay updated." In retweeting interesting and informative articles to her followers, she discovered that Twitter was providing her with a platform for advocacy and policy change.

Avery took a prudent approach, spending most of her time "watching tweets

happen." She explained that by watching what others were saying she was given a "sense of what [she] might want to say or share." She also described Twitter as helping her identify where her colleagues' interests and activities were at the moment. Jocelyn, who entered the course unfamiliar with Twitter, was immediately engaged with it and not only retweeted information but printed out some of these retweets to share with her colleagues in her school's staff room. Jocelyn writes,

> I had never really used Twitter or really understood it until recently. I now use Twitter daily. I follow lots of different news sources as well as early education advocates…I have retweeted lots of articles, ideas and thoughts. I have made a book at school that sits in the staff room and is filled with articles and ideas [many] came from Twitter.

Maya was another student who entered with skepticism about Twitter and had a quick shift in perception. She appreciated how Twitter supported "knowledge sharing" and she saw her retweeting of information to her followers as a providing her with a voice to advocate for a cause she cared deeply about. Naomi, who was "pretty intimidated by using Twitter" when she entered the course, found the assignment of reading and following others as helpful. She described being surprised to learn about toxic stress and the links between early childhood trauma and psychological and health issues, that might be helpful to her professionally, especially for future advocacy.

Several students reacted less positively to Twitter. One student, Layla, enjoyed using Twitter, but found it initially very confusing:

> I enjoyed the Twitter assignment but I feel I am still in my learning curve. When I would find a site I would like to tweet it states I am 're-tweeting' after someone else tweeted before me?...I think I need more one-on-one exercise to have a more in-depth understanding. I am a little frustrated with myself that I do not have the concepts down.

Audrey was concerned about the information overload Twitter brought into her life explaining "There is sooooo much information available, I'm finding it to be a little overwhelming and daunting." And finally, Julia described that she was "struggling to figure out how to use the site effectively." After being redirected to sites that were primarily advertisements or petitions to sign she concluded, "I think I'd like to stick to email, paper letters, flyers and phone conversations." She did, however, leave open the possibility that her classmates or the instructor could "enlighten me to what I'm not yet getting" and concluded that she was willing to continue with Twitter despite her initial discomfort, "I've moved from unconsciously incompetent to consciously incompetent and it's a very uncomfortable place to be but probably worth going through…we'll see."

Although several students had initial skepticism or fears about using Twitter, they learned that it could be used effectively for academic purposes. This phenomenon is described by Hemmi, Bayne, and Land (2009), who document how higher

education faculty often appropriate technologies that were not initially designed for their profession, as is the case with Twitter, and repurpose them to align with scholarly goals and objectives (Veletsianos, 2012). Most students reported that Twitter was useful for connecting them to information, including research, directly relevant to their professional work. Audrey's concern about the information over-load she perceived with Twitter highlights the critical and strategic thinking skills (Leu et al, 2004) that are required for curating and efficiently navigating through the boundless information stream supplied through Twitter. Layla and Julia make visible the specificity of skills and knowledge needed for successful navigation with new literacies, as Layla struggled to make sense of the contextualized discourse (e.g., tweet, retweet) she was encountering, Julia's miscues directing her towards advertisements and petitions instead of useful information exemplify what Guinee et al. (2003) outline as requisite skills for engaging with new literacies including the need to understand how to efficiently search and locate information related to a specific question or problem. Although one-on-one support was offered to strug-gling students, only Julia, asked to meet with the instructor. Layla and Audrey, most likely due to their limited time, continued working with Twitter without having constructed strategies to address the challenges they were facing.

Month 2: Expanding the Uses of Twitter

During the second month, the students made many discoveries about Twitter, expanding their understanding of the possibilities of its use in their professional practice. Still, a few students continued to describe their challenges in optimizing their use of Twitter. The following comment by Julia was very common among students in the second month of class: "I have been getting more comfortable using Twitter to read links that come my way as well as tweeting and re-tweeting interesting facts out to my followers." Students were growing in their confidence and beginning to set goals for themselves as Jocleyn explained, "Soon, I hope I will be able to use Twitter as a tool to spread ideas fast." Lien shared her pride in learning how to add a personal photo to her Twitter account,

> I need to congratulate myself to get rid of my egg (the default icon) on Twitter! It took me too long to get it done. So now my Edmodo, LinkedIn and Twitter have my new photo. Hooray!

Naomi discovered that she could link her Twitter account to her LinkedIn profile which she described was a good idea "because I am tweeting for professional purposes."

Other students began to discover more complex possibilities for their use of Twitter. For example, Maya reported that Twitter was helping her to see "how research and policy are intertwined" and that she was finding it to be a valuable tool for her thesis research and other class research assignments. Julia learned that she could use her Twitter account to encourage people to get involved politically. She tweeted encouraging her followers to sign a petition opposing the California

Governor's proposed budget cuts to education and social services and rallying her followers to participate in the "For Our Babies Campaign," a national movement to support healthy development for infants and toddlers in the United States. Naomi described it as "exciting" to learn that the individuals and organizations she had an interest in would often start to 'follow' her as well. This sentiment was shared by Avery who greatly expanded her use of Twitter in month two, uploading a video, trying out a hashtag, linking her tweets to Facebook and using her smart phone to access and add content to Twitter. Avery decided that having social media skills was "very important and potentially very powerful" explaining,

> . . . you never know who may stumble across an article, video or message that you shared. Being able to connect to everyone from legislatures to friends via a simple # or @ is about as easy as it gets.

Despite increased use, students continued to struggle with several issues. Lien was interested in creating original content in her tweets (versus retweeting) but she reported finding it challenging to come up with content that was informative and "made sense to others." Many students had trouble using hashtags effectively as Jocelyn laments, "I searched the #millsece hashtag but nothing showed up, not even my tweet." Lien had a similar experience,

> I tried #child care #policy hashtags but did not find anything. I tried #policy #preschool and found only 1 tweet.

Audrey very honestly continued to express concerns with the information overload on Twitter,

> I find I'm avoiding checking my Twitter [account] due to a sense of failure at absorbing all of the valuable information there. And forget about the hashtags, oh my gosh, even more information to disaggregate and read. Yikes!

Eight weeks into class, students' discoveries led them to utilize Twitter in ways that extended beyond the course requirements. Students were utilizing their new skills in other courses and contexts of their professional lives (e.g., Maya's thesis research, Julia's political advocacy). Students' skills spanned across a developmental continuum from Lien who was working on the rudimentary skill of adding a personal photo to her Twitter account to Avery who after "observing" others for a month began to explore the full range of interactivity formats available to Twitter users with smart phones (Smith & Brenner, 2012). Twitter was open-ended enough that all students, from beginners to more sophisticated users, could identify skills to develop and formats for participation.

Although never discussed in class, several students connected their Twitter accounts with other ICTs (e.g., LinkedIn, Facebook, Edmodo) they used on a regular basis. Lien's challenges, struggling to "come up with content that was informative" to tweet out to her followers, reinforced the distinction between the more facile participation on the Internet as a content consumer versus the responsibility for idea generation

that is assumed by the web's content creators (Vaughn, 2012). Audrey's avoidance of her Twitter account reinforces that attenuating the digital divide requires attending to all three dimensions: skills, motivation, and possession (Martin, 2003).

Month 3: Strengthening Understanding of Twitter's Usefulness and Limitations

During the final month of class, the students continued to take risks in learning to use Twitter and incorporate it into their professional work. Several attempted to tweet live from policy meetings and advocacy events they attended. Julia describes tweeting from an advocacy event, Stand For Children Day, in Sacramento, California and her discovery that "Brain Dad" began following her as a result, a connection that led her to interview him for a research study. She described this exchange as her "first real connection" made on Twitter. Jocelyn learned that she could sign up for Google alerts using the key words "child care policy" to find new content for her tweets. Avery was inspired by seeing how her contributions on Twitter were being shared with a wider audience, "It may sound silly but a small pleasure or 'win' [for me is] watching my colleagues and friends retweet videos, articles and links that I posted on Twitter." Maya described how she discovered that Twitter could be a valuable tool for exposing her to multiple points of view related to a current issue in the profession. She explains:

> While following CPFA [Calfornia Food Policy Advocates], I was surprised to notice the emphasis on food hunger issues for children in America. It is so interesting for me to read about this in contrast to the main issue I read about being childhood obesity…Twitter has helped me see things from several different stakeholders' opinions…it has helped me to put issues into a larger context and better understand why the issues are being addressed and how to fit my own [opinion] into the mix.

Avery described having a very similar discovery explaining that she was starting to figure out which organizations were posting information that was the most interesting to her. However, what really intrigued her was the discovery that Twitter could help her learn about stakeholders whose ideas were really different from her own,

> . . . what occurred to me just recently was the idea of following an organization whose ideas and efforts *don't* align with my own. I am finding that it is very important to "watch" what other people care about, and what they are pushing for. No one will come out and say, "I'm against kids" but their policies might. I think it's really important to be aware of those efforts.

Naomi expanded her understanding of how she could integrate Twitter meaningfully into her professional goals, one of which was to create cross-sector conversations among professionals to address the challenges that prevent foster care children from receiving the services they need. After posting a video on her Twitter account that highlighted a potential solution, she realized that the organization that

created the video could be a really important resource for her, "I am thinking that NRCOI (National Child Welfare Resource Center for Organizational Improvement) which is where I found the video that I posted could be a really great resource for my upcoming systems building work as it gives really good ideas about Child Welfare working with other community agencies." And Lucy, the one student who entered the class with an active Twitter account, described how she had learned to send tweets between her different Twitter accounts, integrating 'living technologies' (the personal account she used to share information about her political views) with 'learning technologies' (the educational account she was required to set up for class, Kirkwwod & Price, 2005). She playfully recounts, "my political persona tweeted to my education persona."

As students' increased their comfort and skills in using Twitter this final month of class, they were also more aware of its limitations. For example, Julia critiqued Twitter's lack of interactivity, "For the most part, I feel that I send out things but never get feedback if anyone is out there receiving my tweets." Julia's comments about her connection with Brain Dad being her first "real" connection on Twitter and her concern that she would send tweets out without knowing if anyone was receiving them highlights the need for individuals to have specific skills in order to utilize Twitter's interactive capabilities. Social media platforms are foundationally designed to support interactivity and this is done on Twitter through replies, retweets, @mentions and direct messages, however, a core component of interactivity is feedback, where communication is dynamic and alternating between a sender and receiver (Kiousis, 2002) and responsiveness, when the receiver of a message sends a reply that directly pertains to the source of the original message (Stromer-Galley, 2000).

Many users on Twitter limit their participation to reading posts (content consumption), an activity devoid of feedback and responsivity, leaving users like Julia feeling a lack of interactivity in her social media communications. This is reinforced by the fact that a user on Twitter can follow, or be followed by, organizations and individuals he or she knows, as well as others, where there has been no prior connection or relationship. One of the new literacies of online participation involves learning how to engage in reciprocal communication to "seek information, think together about information, [and] share what you have learned" with others in one's personal network in ways that lead to continuous feedback and responsivity (Leu et al., 2011, p. 7). Ultimately, Julia's experiences highlight how Twitter's main functionality is not conversation between users. In fact, Twitter has shifted its original function as a social conversationally oriented network to more of a real-time information network connecting users to the latest information on a diverse array of topics (Cheney, 2011).

Another criticism of Twitter was raised by Jocelyn who discovered the fleeting nature of the content on Twitter, "I did some research this month and learned that Twitter only keeps a hashtag in its archive for one week…[which] means that certain tweets get lost after one week as they won't show up on any searches." Joc-

elyn reported that one way she learned to work around the impermanence of tweets was to retweet anything she wanted to 'save,' an effective albeit inefficient strategy highlighting once again the specific skills needed to synthesize information that is not only vast and boundless but also transient in social media environments.

Reflections and Reframing: Lessons Learned

This self-study was motivated by the primary author's commitment to use her courses as contexts where the digital divide could be interrupted for students, a goal she believes is essential for her students' future success in professional contexts and as citizens desiring full participation in democratic processes. Juxtaposing these commitments with the limited face time she had with students and their widely divergent digital literacy skills highlights what Whitehead (1989) coined as the 'living contradiction' at the heart of self-study. The first research question inquired how the integration of Twitter into a higher education course could support students in learning to participate in digital environments. The study's findings suggest that Twitter did expand the digital participation for the majority of the students. All ten students successfully created Twitter accounts and completed the range of assignments for the course, identifying key individuals and organizations to follow and tweeting or retweeting relevant information to their own followers. Each student expanded her understanding of the technical aspects of Twitter and many made important discoveries that extended well beyond the course requirements, for example, how to link Twitter with other professional ICT accounts. Students' described a range of benefits that they associated with learning to use Twitter including real-time knowledge sharing about current issues in the field that informed their professional development, the ability to exploring multiple viewpoints about a current professional topic including those of stakeholders whose opinions were perceived to be inimical to one's own, locating and connecting with organizations and individuals who shared their professional interests, perceiving that they could insert their 'voice' as professional advocates into public conversations and being able to encourage political participation and civic engagement around issues of importance to them. Seven students' use of Twitter by semester's end spanned the continuum from consumption, to curation to creation, an important finding as six of these students entered the class with no prior experience with Twitter. Significantly, all of the students reported that they were interested in continuing to use Twitter professionally after the course was complete. Even Julia, whose first impression of Twitter was quite critical, expressed her gratitude for "making me get this far with it" as she felt that she "probably would not have done it" without the requirement to learn it for a college course.

Despite these successes, it is critical to point out that three students (Layla, Alejandra and Audrey) never extended their participation beyond content consumption, reading and retweeting others users' tweets. Their experiences exemplify the important barriers that students encountered in learning to use Twitter in higher education for academic purposes. Time constraints and the demands of working and

attending graduate school full time prevented Layla and Audrey from receiving the necessary scaffolding for overcoming the confusion (Layla) and overwhelm (Audrey) they identified as their primary experiences in using Twitter. Developing quality content for Twitter was another significant challenge experienced by many students because of the time required and the new literacy skills they lacked to locate and curate content that would be interesting for their followers. Further, students experienced barriers in their desire to participate in sustained interactive communication with other professionals on Twitter, reflecting the need to develop specific skills and knowledge for inspiring this type of exchange in a social media context.

Documentation of students' range of experiences using Twitter and the complement of successes and challenges they faced, suggests two important recommendations for revising the content and pedagogical decision-making for this course; explicit instruction in the 'new literacies' of online reading comprehension strategies and creating contexts for students to experience sustained successful interactivity in online microblog environments.

Providing Explicit Instruction in the New Literacies of Online Reading Comprehension

As Leu et al. (2011) outline, the Internet and other ICTs require individuals to have a range of new literacies for their effective use. Many of the struggles that the students reported were a result of not having developed sufficient knowledge and skills related to these new literacies. Future coursework must address this gap providing students with an understanding for, and practice time to develop, the following key skills: (a) the ability to identify questions and frame problems to guide reading on the internet, (b) the capacity to identify information that is relevant to one's needs, (c) competence with critically evaluating online information, (d) facility with reading and synthesizing information from multiple multimedia sources, and (e) understanding how to communicate with others in contexts where information is learned about and shared collaboratively. Using students' background knowledge of Internet and ICT technologies (e.g., LinkedIn) as a foundation for scaffolding their use of Twitter is a strategy that should be implemented more intentionally. Intervention for students who struggle needs to be built into the course more explicitly to ensure that all students have opportunities to consume, curate and create content. Without structured efforts to collect information about students' experiences early and often and to use this data to design responsive interventions and supports for students from their earliest signs of confusion, overwhelm and struggle, the course contravenes its expressed purpose by not only reinforcing but further *expanding* the inequities of the digital divide.

Creating Contexts for Interactivity

As the first author's goals in her use of Twitter were primarily about information gathering, it would be helpful to expand this focus to place equal emphasis on social interactivity. Creating opportunities to provide students with time to practice

engaging in interactive communication using tweets with one classmate or a small group of students (before they tweet on a public stage) would provide them with an important scaffold for discovering the complexities involved in extending and expanding digital conversation through the use of 140 characters, weblinks and hashtags. Creating this more intimate context for practice may also inspire hesitant content creators to take more risks in generating original content for tweets. Planning to have students collectively document (e.g., through a class wiki or Google doc) and discuss their discoveries, questions and frustrations as a class, could increase their opportunities to learn from, and scaffold, one another especially regarding successes and disappointments they experience in their attempts to use Twitter for professional networking and interactive communication.

Conclusion

This self-study extends the emerging scholarship on the integration of social networking tools into higher education environments. As highlighted throughout this paper, the first author found that the majority of her students were able to successfully learn to use Twitter for professional purposes yet they also experienced significant challenges. The data reinforced that meaningful integration of social networking tools requires that students not only learn the technical complexities of using digital tools, they must also learn specialized discourses associated with online participation and a wide array of new literacy skills and reading comprehension strategies that are necessary for efficient and effective navigation on the Internet.

As the aim of self-study research is to challenge and illuminate, this self-study has inspired the first author to consider the need to design her coursework to provide more comprehensive and continuous scaffolding for her students to learn about the 21st century literacies and their requisite reading comprehension fundamentals. Although these are assumed for confident and facile use of such social networking tools as Twitter, they only develop with explicit and continuous teaching and learning cycles as is the case with traditional literacies. Future research is needed that highlights praxis in scaffolding digital literacies, making visible pathways that teacher educators are forging between theoretical understandings of new literacies and the specific pedagogical strategies needed by different students to experience success in becoming engaged, motivated, and skillful digital participants.

As Leu et al. (2011) remind all of us that deixis is a foundational quality of the new literacies of the Internet and other ICTs, the process of supporting students' digital literacy development is an inimitable cat and mouse game; as new technologies continuously emerge, new literacies, skills and strategies, will be necessary for their effective use. This suggests that teacher educators and their students must remain nimble with the uncertainty inherent to work addressing the digital divide and engaging in new literacy development. Increasing competencies for intelligently navigating the Internet and tools like Twitter are critical for students' futures. Yet,

an important idea emerging from this self study is deixis as metaphor reflecting the dispositional development required to guide oneself and one's students to work productively in contexts of perpetual change and uncertainty. Thus, the work for teacher educators entails a continuous toggle between supporting students' development of skill and knowledge specificities tailored to unique technologies like Twitter while also strengthening their commitment to place themselves at the arc of new learning curves as technologies are continuously being reimagined and replaced. The progression of technology dictates nothing less than a need for a dedicated unwavering courageous learning stance for all of us.

Note

[1] Hashtags are identified by the # symbol in Twitter and are used to mark keywords or topics in a tweet.

References

Ajjan, H., & Hartshorne, R. (2008). Investigating faculty decisions to adopt 2.0 technologies: Theory and empirical tests. *The Internet and Higher Education, 11*, 71-80.

Bittman, M, Rutherford, L., Brown, J., & Unsworth, L. (2011). Digital natives? New and old media and children's outcomes, *Australian Journal of Education, 55*(2), 161-175.

Bullough, R. V., & Pinnegar, S. (2001). Guidelines for quality in autobiographical forms of self-study research. *Educational Researcher*, *30*(3), 13-21.

Cheney, P. (2011). Twitter is an information network, not a social network. Retrieved from http://www.practicalecommerce.com/blogs/post/818-Twitter-is-an-Information-Network-Not-a-Social-Network

Coddington, R. (2010). Professors' use of technology in teaching. *The Chronicle of Higher Education.* Retrieved from http://chronicle.com/article/article-content/123682

Coiro, J. (2003). Reading comprehension on the Internet: Expanding our understanding of reading comprehension to encompass new literacies. *The Reading Teacher*, *56*, 458-464.

Coiro, J., Knobel, M., Lankshear, C., & Leu, D. J. (Eds.). (2008). *Handbook of research on new literacies.* New York: Lawrence Erlbaum Associates.

Conole, G. (2011). *Book: Designing for learning in an open world*. Retrieved from http://cloudworks.ac.uk/cloudscape/view/2155

Corbin, J., & Strauss, A. (2007). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Thousand Oaks, CA: Sage.

Cuban, L., Kirkpatrick, H., & Peck, C.(2001). High access and low use of technologies in high school class- rooms: Explaining an apparent paradox. *American Educational Research Journal*, *38*(4), 813-834.

DiMaggio, P., & Hargittai, E. (2001). *From the 'Digital Divide' to 'Digital Inequality': Studying Internet use as penetration increases* (Working Paper Series 15). Princeton, NJ: Center for Arts and Cultural Policy Studies, Princeton University.

Dunlap, J., & Lowenthal, P. (2009). Horton hears a tweet. *EDUCAUSE Quarterly, 32,* 1-10.

Ebner, M., Lienhardt, C., Rohs, M., & Meyer, I. (2010). Microblogs in higher education-A chance to facilitate informal and process-oriented learning? *Computers and Education, 55,* 92-100.

Elliott, J. (1985) Facilitating educational action-research: Some dilemmas. In R. Burgess (Ed.). *Field methods in the study of education*. London, UK: Falmer Press.

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O.. Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education, 59*, 2, 423-435.

Fabos, B. (2008). The price of information: Critical literacy, education, and today's Internet. In J. Coiro, M. Knobel, C. Lankshear, & D.J. Leu (Eds.), *Handbook of research on new literacies* (pp. 839–870). Mahwah, NJ: Lawrence Erlbaum Associates.

Fox, S., Zickuhr, K., & Smith, A. (2009). *Twitter and status updating*. Available at www.pewinternet.org/~/media//Files/…/PIP_Twitter_Fall_2009web.pdf

Galguera, T., & Nicholson, J. (2010). Computer mediated communication and scaffolding toward new literacy in Pre-service teacher education courses. *MERLOT Journal of Online Learning and Teaching*, *6*(1), 306-317.

Greenhow, C., Robelia, B., & Hughes, J. (2009). Learning, teaching and scholarship in a digital age: Web 2.0 and classroom research: What path should we take now? *Educational Researcher, 38*, 233-245.

Guinee, K., Eagleton, M., & Hall, T. (2003). Adolescents' Internet search strategies: Drawing upon familiar cognitive paradigms when accessing electronic information sources, *Journal of Educational Computing Research, 29*(3), 363-374.

Hague, C., & Williamson, B. (2009) Digital participation, digital literacy, and school subjects: a review of the policies, literature and evidence. Available at http://www.futurelab.org.uk/resources/documents/lit_reviews/DigitalParticipation.pdf

Hannay, M., & Gretwell, C. (2011). The higher education workplace: Meeting the needs of multiple generations, *Research in Higher Education Journal, 10*, 1-12.

Hemmi, A., Bayne, S., & Land, R. (2009). The appropriation and repurposing of social technologies in higher education. *Journal of Computer Assisted Learning, 25,* 19-30.

Jenkins, H. (2006). *Convergence culture: Where old and new media collide*. New York: New York University Press.

Jenkins, H., Clinton, K., Purushotma, R., Robinson, A., & Weigel, M. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century*. Available at http://digitallearning.macfound. org/site/c.enJLKQNlFiG/b.2029291/k.97E5/Occasional_Papers.htm

Joint Information Systems Committee. (2008). *Great expectations of ICT: How higher education institutions are measuring up*. Retrieved from http://www.jisc.ac.uk/publications/publications/greatexpectations

Joint Information Systems Committee. (2012). *Developing digital literacy*. Available at http://www.jisc.ac.uk/media/documents/publications/briefingpaper/2012/Developing_Digital_Literacies/pdf

Junco, R., Heibergert, G., & Loken, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning, 27*, 119-132.

Jung, J. (2008). Internet connectedness and its social origins: An ecological approach to post- access digital divides. *Communication Studies, 59*(4)*,* 322-339.

Kassens-Noor, E. (2012). Twitter as a teaching practice to enhance active and informal learning in higher education: The case of sustainable tweets, *Active Learning in Higher Education, 13*(1), 9-21.

Kennedy, G., Judd, T., Churchward, A., Gray, K., & Krause, K. (2008). First year students'

experiences with technology: Are they really digital natives? *Australasian Journal of Educational Technology, 24*(1), 108-120.

Kinzer, C. K., & Leander, K. (2003). Technology and the language arts: Implications of an expanded definition of literacy. In J. Flood, D. Lapp, J. R. Squire, & J. M. Jensen (Eds.), *Handbook of research on teaching the English language arts* (2nd ed.) (pp. 546–566). Mahwah, NJ: Lawrence Erlbaum Associates.

Kiousis, S. (2002). Interactivity: A concept explication. *New Media & Society, 4*(3), 355-383.

Kirkwood, A., & Price, L. (2005). Learners and learning in the 21st century: What do we know about students' attitudes and experiences of ICT that will help us design courses? *Studies in Higher Education, 30*(3), 257-274.

LaBoskey, V. (2004). The methodology of self-study and its theoretical underpinnings. In J. Loughran, M. Hamilton, V. LaBoskey, & T. Russell (Eds.). *International handbook of self study of teaching practices* (pp. 817-869). London, UK: Kluwer Press.

Lankshear, C., & Knobel, M. (2003). *New literacies: Changing knowledge in the class-room.* Buckingham, UK: Open University Press.

Lemke, J. L. (1998). Metamedia literacy: Transforming meanings and media. In D. Reinking, M. C. McKenna, L. D. Labbo, & R. D. Kieffer (Eds.). *Handbook of literacy and technology: Transformations in a post-typographic world* (pp. 283–301). Mahwah, NJ: Lawrence Erlbaum Associates.

Lenhart, A, Purcell, K., Smith A., & Zickuhr, K. (2010). *Social media and mobile Internet use among teens and adults*. Washington, DC: PEW Research Center.

Leu, D. J., Kinzer, C., Coiro, J., & Cammack, D. (2004). Toward a theory of new literacies emerging from the Internet and other Information and Communication Technologies. In R. Ruddell & N. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed.) (pp. 1570-1613). Washington, DC: International Reading Association.

Leu, D., McVerry, J., O-Byrne, W., Kiili, C., Zawilinski, L., Everett-Cacopardo, H., Kennedy, C., & Forzani, E. (2011). The new literacies of online reading comprehension: Expanding the literacy and learning curriculum, *Journal of Adolescent & Adult Literacy, 55*(1), 5-14.

Leu, D. J., O'Byrne, W. I., Zawilinski, L., McVerry, J. G., & Everett-Cacopardo, H. (2009). Expanding the new literacies conversation. *Educational Researcher, 38*(4), 264-269

Loughran, J., & Northfield, J. (1998). A framework for the development of self-study practice. In M. L. Hamilton (Ed.), *Reconceptualizing teaching practice: Self-Study in teacher education* (pp. 7-18). London, UK: Falmer Press.

Martin, . (2003). Is the digital divide really closing? A critique of inequality measurement in a nation online. *IT & Society*, *14*, 1-13.

Miles, M., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook.* (2nd ed.). Thousand Oaks, CA: Sage.

Modarres, A. (2011). Beyond the digital divide, *National Civic Review, 100*(3), 4-7.

Moran, M., Seaman, J., & Tinti-Kane, H. (2011). *Teaching, learning, and sharing: How today's higher education faculty use social media for work and for play.* Boston: Pearson Learning Solutions. Available at http://tinyrul.com/pearsonstudy

Muspratt, A., Luke, A., & Freebody, P. (Eds.). (1998). *Constructing critical literacies: Teaching and learning textual practice*. Cresskill, NJ: Hampton.

National Center for Education Statistics. (2003a). *Internet access in U.S. public schools and class-rooms: 1994–2002, NCES 2004-01*. Washington, DC: U.S. Department of Education.

National Center for Education Statistics. (2003b). *Computer and internet use by children and adolescents in 2001, NCES 2004–014*. Washington, DC: U.S. Department of Education.

National Council of Teachers of English. (2008). *Position statement: 21ˢᵗ century curriculum and assessment framework.* Available a www.ncte.org/positions/statements/21stcentframework

Oblinger, D. (2010). From the campus to the future. *EDUCAUSE Review,* 45, 42-52.

Parry, B. (2008). *Twitter for academia*. Available at http://academhack.outsidethetext.com/home/2008/twitter-for-academia

Poore, M. (2011). Digital literacy: Human flourishing and collective intelligence in a knowledge society. *Literacy Learning: the Middle Years*, *19*(2), 20-26.

Reinhart, J., Thomas, E., & Toriskie, J. (2011). K-12 teachers: Technology use and the second level digital divide, *Journal of Instructional Psychology, 38*(3) 181-193.

Reinking, D. (1998). Synthesizing technological transformations of literacy in a post-typographic world. In D. Reinking, M. C. McKenna, L. D. Labbo, & R. D. Kieffer (Eds.), *Handbook of literacy and technology: Transformations in a post-typographic world* (pp. xi–xxx). Mahwah, NJ: Lawrence Erlbaum Associates.

Richardson, W. (2009). *Blogs, wikis, podcasts and other powerful web tools for classrooms*. Thousand Oaks, CA: Corwin Press.

Rosenbaum, S. (2012). *5 Tips for great content curation*. Available at http://mashable.com/2012/04/27/tips-great-content-curation/.

Schroeder, A., Minocha, S., & Schneider, C. (2010). The strengths, weaknesses and threats of using social software in higher and further education teaching and learning. *Journal of Computer Assisted Learning, 26,* 159-174.

Smith, A., & Brenner, J. (2012). *Twitter use 2012*. Available at http://pewinternet.org/Reportts/2012/Twitter-Use-2012.aspx

Smolin, L. I., & Lawless, K. A. (2003). Becoming literate in the technological age: New respon- sibilities and tools for teachers. *The Reading Teacher*, *56*, 570–577.

Stenhouse, L. (1975). *An introduction to curriculum research and development*. London, UK: Heinemann.

Stromer-Galley, J. (2000). On-line interaction and why candidates avoid it. *Journal of Communication*, *50*(4), 111-132.

Valadez, J., & Duran, R. (2007). Redefining the digital divide: Beyond access to computers and the internet, *The High School Journal, 90*(3), 31-41.

Vaughn, P. (2012). *10 habits of top notch content creators*. Available at http://blog.hubspot.com/blog/tabid/6307/bid/30559/10-Habits-of-Top-Notch-Content-Creators.aspx

Veletsianos, G. (2012). Higher education scholars' participation and practices on Twitter. *Journal of Computer Assisted Learning, 28,* 336-349.

Wankel, C. (2009). Management education using social media. *Organization Management Journal, 6*(4), 251-263.

Warschauer, M. (2003). Demystifying the digital divide. *Scientific American, 289*(2), 43-47.

Whitehead, J. (1989). Creating a living educational theory from questions of the kind, "How do I improve my practice?" *Cambridge Journal of Education, 19*(1), 1–11.

Wright, N. (2010). Twittering in teacher education: Reflecting on practicum experiences, *Open Education, 25*(3), 259-265.

Yin, R. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage.