Education Faculty Publications and Presentations

School of Education

2019

"I Found Myself Retweeting": Using Twitter Chats to Build Professional Learning Networks

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Educational Technology and Resources for Synchronous Learning in Higher Education

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British Cataloguing in Publication Data
A Cataloguing in Publication record for this book is available from the British Library.

All work contributed to this book is new, previously-unpublished material.
The views expressed in this book are those of the authors, but not necessarily of the publisher.

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Chapter 5

"I Found Myself Retweeting":
Using Twitter Chats to Build Professional Learning Networks

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ABSTRACT

This chapter describes a mixed-method, multiple case study that examined ways in which synchronous educational Twitter chats were used, first, to enhance graduate and undergraduate university student learning, second, to build professional networks, and third, to provide a loosely regulated means to achieving self-determined professional development goals. Findings suggest that while difficult at the onset, participation in Twitter educational chats was an enhancement to students' overall course learning experience. Specifically, university students' use of chats for educators helped them achieve social presence in this virtual environment, as well as to better understand the connections between positive student-teacher relationships and K12 student learning. Included are recommendations for use of Twitter synchronous educational chats in the college classroom as well as future directions in research.

SOCIAL MEDIA, TEACHER EDUCATION, AND PROFESSIONAL LEARNING

College students have grown up in a world that is always plugged in and turned on. Anderson and Rainie (2012) used the term "hyperconnected" to refer to those millennials, who are constantly tethered to their devices. Instead of socializing with friends in the same physical space, the new normal is one of increasing interactions with varying social networks (Eagan, Stolzenberg, Ramirez, Aragon, Suchard, & Hurtado, 2014). According to Junco, Heiberger, and Loken (2010), social media platforms are vital to the American college student's life. In fact, more than 72% of millennial college students have a social media presence and update their network at least once a day (Lenhart, Purcell, Smith, & Zickuhr, 2010). Furthermore, research has suggested that more than half of college students are continuously connected to popular social media platforms such as Facebook, YouTube, Snapchat, Instagram, and Twitter (Smith & Anderson, 2018). This chapter examines ways in which Twitter chats were used, first, to enhance graduate and undergraduate university student learning; second, to build professional networks; and third, to provide a loosely regulated means to achieving self-determined professional development goals.

In 2010, The U.S. Department of Education released its *National Education Technology Plan, Transforming American Education: Learning Powered by Technology*, which suggested that educators "leverage the learning sciences and modern technology to create engaging, relevant, and personalized learning experiences for all learners that mirror students' daily lives and the reality of their futures" (Office of Educational Technology, p. 4). The New Media Consortium predicted that social media will be used as a platform for continuous sharing of information and collaboration in education over the next five years (Adams Becker et al., 2017). Validating this view of the near future, Delello, McWhorter, and Camp (2015) suggested that the use of social media in higher education may better create a sense of community, engage students in the learning process, and help students form a more personal meaning of the material.

As teacher-educators, the authors of this chapter sought ways relevant to "hyperconnected" college students to build a sense of affiliation with their professional communities early in their careers, specifically during their professional preparation. Research shows that teachers who engage regularly with long-term, authentic, sustaining professional learning such as collaborative groups (Darling-Hammond, Hyler, & Gardner, 2017), professional organizations (Webster-Wright, 2017), and communities that support professional learning (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006), tend to report more satisfaction (Webster-Wright, 2017) and, perhaps unsurprisingly, are better teachers (Roehrig, Dubosarsky, Mason, Carlson, & Murphy, 2011). The authors concur with Webster-Wright's (2017) observation

that while professional learning "cannot be controlled, in that no one can make another person learn, professionals can be supported to continue to learn in their own authentic way while taking into account the expectations of their working contexts" (p. 725). Particularly when working with college students who are newcomers to a profession, who are still, themselves, "betwixt and between" (Cook-Sather, 2006, p. 110) being neither fully a student nor a professional educator, it makes sense to find familiar pathways for them to venture outside school walls and learn from other educators, who are also committed to their own professional learning.

Within the last five years, an upswell of professional educator groups have appeared on Facebook, an asynchronous social networking platform for families, friends, and other self-selected users. In that vein, numerous, varied, one-hour, regularly scheduled, educator chats have become available on Twitter -- a microblogging, social networking platform open to all -- that provides synchronous professional and conversational opportunities. While the use of social media platforms for professional development is well established, there is a still a dearth of research in education on using live Twitter chats for preservice teachers (Carpenter, 2015; Luo, Sickel, & Cheng, 2017). Furthermore, the National Education Plan advocates for social networking sites to become integrated into professional preparation and development programs as teachers "connect to content, expertise, and activities through online communities" (Office of Educational Technology, 2010, p. 42). Better networked, not isolated, educators, stay in the profession. This research attempts to add to the literature about the complexities and potential benefits to preservice teachers of forging professional connections using synchronous discussion formats like Twitter. Given the dynamic of immediacy these real-time, smartphone-to-smartphone Twitter chats offer, the question driving this research concerned whether and how our undergraduate and graduate students interacted with and learned from their respective professional groups in Twitter's synchronous chats.

BACKGROUND

Theoretical Constructs

This chapter is framed by a sociocultural view of learning as mediated by social, cultural, and historical contexts (Vygotsky, 1978; Wertsch, 1991). In this view, learning is not merely the process of mechanically "banking" (Freire, 2000) facts inside a learner's head. Instead, learning occurs under the guidance of others within culturally constructed activities. Since "action is mediated and ... cannot be separated by the milieu in which it is carried out" (Wertsch, 1991, p. 18), learning

is understood as participatory and situated (Lave & Wenger, 1991) within those milieu, contexts, and/or spaces.

Moreover, in this view, within a given domain or practice learning occurs through "legitimate peripheral participation" (Lave & Wenger, 1991), a process by which those new members are first recognized, then ushered, advised, or mentored into that practice by those who are veterans, or relative veterans, and who provide newcomers with widely varying degrees of support. In other words, "participation in the cultural practice in which any knowledge exists is an epistemological principle of learning. The social structure of this practice, its power relations, and its conditions for legitimacy define possibilities for learning (i.e., for legitimate peripheral participation)" (Lave & Wenger, 1991, p. 98). Thus, the process of learning is complicated by power, historical practices, and ways in which people are recognized, or not, as belonging.

Relevant here, within the macro-domain of education are multiple and overlapping affiliations, each with their own continua of expertise. To a degree, all share some of the same objectives. However, within education, there exist meso-levels, and often overlapping subgroups of administrators, technicians, and teachers. Salient to the present study, however, are the relative micro-groups into which teachers are divided including for example, grade-level divisions, reflecting both elementary and secondary brackets, and disciplinary divisions encompassing content areas like science, mathematics, English, and many more. Each subgroup values different and pointedly specific ways of knowing, communicating, and being in the world. Some would call these sometimes overlapping collectives "communities of practice" (Lave & Wenger, 1991):

The concept of community of practice underlying the notion of legitimate peripheral participation, and hence of "knowledge" and its "location" in the lived-in world, is both crucial and subtle...A community of practice is a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice. A community of practice is an intrinsic condition for the existence of knowledge, not least because it provides the interpretive support necessary for making sense of its heritage. (p. 98).

Undergraduate preservice teachers and graduate students who are practicing teachers, alike, need to affiliate within their own, sometimes overlapping, communities of practice (COP), not only for their preparation toward licensure, but even more importantly, as a skill-set they can take with them into their own classrooms as teachers-of-record. It is important for university students to understand that the world in general --and the teaching world in particular--is a very large and mostly hospitable place -- much more so than any particular school, district, region, or even state.

While the Twitter-verse dispenses with physical space, it is, in fact, a cultural space that participants can reach with relative ease. A useful construct for this research is Bakhtin's (2002) metaphorical notion of "*[c]hronotope* (literally "time space")…the intrinsic connectedness of spatial and temporal relationships that are artistically expressed in literature" (p. 15). Though he wrote as a literary theorist, his ideas have been widely adopted and adapted in educational research (cf. seminal works such as Nystrand, Gamoran, Kachur, & Prendergast, 1997; Wertsch, 1991, and others). Bakhtin (2002) specifically foregrounds the chronotope of "the *road*" (p. 16) in narrative as a locus where encounters can and do take place. Referencing the "collapse of social distance" (p. 17) between participants on the road, this locus, the road, becomes a unique, metaphorical space for "where the most various fates may collide and interweave with one another" (p. 17). Open to people in all time zones, at the same moment in lived reality, Twitter synchronous chats provide a unique time-space "road" that suspend usual conceptions of place-based or of enrolled, online learning environments. Each of these synchronous chats is, in fact, not only a cultural space but a virtual road-trip with fellow travelers, who are likely to be part of the community or communities of practice of its moderators and participants. Thus, for domain newcomers, their experiences in a given Twitter discussion forum, may well offer them opportunities for acclimating to the mores of a community of practice, as well as for learning how to manage their social presence within a given group.

Social presence in online contexts, including social media, refers to the degree to which participants feel comfortable and competent. According to Kehrwald (2008), three factors are at play. First, participants must learn social cueing in online contexts; second, opportunity to interact must be available; and third, the participants must be motivated by "either *need*…. or *interest*" to sustain the effort that establishing social presence takes (p. 97, italics in the original). In establishing social presence, users may project their personal characteristics into the community, thereby presenting themselves to other participants as "real people" (Garrison, Anderson, & Archer, 2000, p. 89) who may be approachable. Social media, well-used, may enhance interactions between individuals and contribute to participants achieving "social presence [as it] is one of the most significant factors in… building a sense of community" (Aragon, 2003, p. 57).

To recap, this inquiry aligns with a sociocultural view of learning, in which learning is situated within the real-world processes by which newcomers and experts in a given domain or practice interact -- for the sake of the practice. Moreover, communities are formed around these domains each of which carries its own history, mores, knowledge, and power dynamics. Social media is viewed as a valid learning space and the time-space "road" chronotype of synchronous environments like Twitter hold great promise due, in part, to the loosely regulated nature of social media. Finally, discipline-specific educator chats within Twitter may provide an arena

for university students to discover, explore, and chart some of the people, customs, and important conversations within their soon-to-be professional homes. In the next section, literature is reviewed which is relevant to, first, a better understanding of synchronous and asynchronous online experiences; second, features and use of Twitter, itself; and, third, elements of professional learning taking place within digital platforms.

Social Networking: Asynchronous and Synchronous

Connection and virtual networking through the use of social networking sites is accomplished through asynchronous and/or synchronous communications. Asynchronous communication occurs outside of "real time" and can include text-based activities such as email, blogs, Wikis, social media posts, and discussion boards. The popular social networking sites Facebook, Pinterest, LinkedIn, and even Twitter have asynchronous components where users may transmit or post text independent of another user (Delello, Everling, McWhorter, & Lawrence, 2013). On the other hand, synchronous digital communication consists of two or more people interacting simultaneously. A few examples include: a "real-time" session taking place within Facebook's internal Messenger; two or more people on a call using Skype, Zoom, or FaceTime; or, a Twitter chat. All of these and many more, both asynchronous and synchronous, have been and continue being used in personal and professional realms, including those associated with schooling. Since the question guiding this work lies in better understanding whether there is educational value in Twitter chats and what that learning looks like, Palloff & Pratt's (2013) finding that such synchronous activities have shown higher rates of engagement than the use of isolated asynchronous tools, is encouraging.

Twitter in Higher Education

One social media platform that is increasingly used in higher education is the social networking and microblogging tool, Twitter (see *aboutTwitter.com*). Developed in 2006, Twitter allows users to join an asynchronous conversation by tweeting or retweeting up to a 280-character message. A tweet may also contain hyperlinks and media attachments such as pictures and videos that are not part of the original word count. In addition, users may utilize hashtags, a type of metadata made up of words or phrases that contain the prefix sign #, that help users to organize topics or find followers with similar interests. Twitter also allows for a synchronous conversation or chat to take place in "real-time" around one unique hashtag. Twitter ranks as one of the most popular social networking networks. In fact, in the first quarter of 2018, there were over 336 million monthly users across the globe who were tweeting out

a half-billion tweets per day (Statista, 2018). According to an article in *NEA Today*, "education dominates the Twittersphere: out of the half billion tweets posted daily, 4.2 million are related to education, according to Brett Baker, an account executive at Twitter.com" (Zeidner, 2014, 6). While the total daily tweets were quite stable from 2014 to 2018, it is still staggering especially when one considers the widespread use of educational Twitter chats across that time span.

According to the Pew Research Center, Twitter has also become a part of American college students' experience. In fact, the highest percentage of Twitter users (40%), are young adults, aged 18-29 (Smith & Anderson, 2018). Several studies have underscored the positive role of Twitter within the classroom. For example, Twitter was shown to improve student engagement and overall course grades (Junco et al., 2010), increase classroom expertise (Wessner, 2014), and foster a sense of community (Kassens-Noor, 2012). Yet, according to Moran, Seaman, and Tinti-Kane (2011), only 12% of faculty used Twitter for professional purposes and according to a Faculty Focus (2010) report, few have employed it as a component of an assignment due to its supposed negative consequences of increased classroom distractions and poor writing skills.

Use of Twitter for Professional Development

A number of studies have shown the potential of Twitter for professional development and networking opportunities (Holmes, Preston, Shaw, and Buchanan, 2013; Luo et al., 2017; Trust, 2012). According to Luo et al. (2017), "Twitter live chats hold tremendous potential for professional learning from a global network of educators" (p. 233) for in-service and preservice educators. Useful for both practicing teachers as professional development as well as for preservice teachers in their preparation programs, the synchronicity of Twitter chats allows for a sense of what we call *right-thereness* that is unlikely to be found in an edited discussion. Valorizing the benefits of live chats, Venable and Milligan (2012) posited that "[w]hile Twitter allows for both synchronous and asynchronous online communication, *it is the real-time connection, through a live Twitter chat event, that presents new possibilities for transforming online course discussion*s" (p. 4, emphasis added). These exchanges of information can also promote social connections, decrease isolation, and build communities of educators (Carpenter & Krutka, 2014; 2015). These digital avenues of connection can make it possible for teachers to discover that they share common interests and can offer instantaneous, personalized opportunities for professional growth (Visser, Evering, & Barrett, 2014). Moreover, according to Cox (2012), as school budgets continue to shrink, the quality of the professional connections are often beyond the scope of what a typical educator would have access to. As well,

Delello and McWhorter (2013) concluded that Twitter may promote a more connected, personalized learning experience for students in higher education.

Professional Learning Networks

Professional Learning Networks (PLNs), understood here as experienced through digital platforms, are defined as "system[s] of interpersonal connections and relationships and resources that support information learning" (Trust, 2012, p. 133). In thinking about what factors promote professional learning in these contexts, Beach (2012) suggested that online opportunities for professional development should include three key components: content on specific subject matter, the opportunity to reflect upon the learning, and an opportunity to collaborate with others. Reminding educators that using technology does not supplant the need for such thoughtful pedagogy, Chickering and Gamson's (1996) seminal work on the use of technology suggested that good teaching is based upon active learning and cooperation: "Good learning, like good work, is collaborative and social, not competitive and isolated" (p. 3). Still true today, McCorkle & McCorkle (2012) indicated that even though students are experienced with using social media for personal reasons, they may be unsure how connect with others for professional networking. Thus, it falls to teacher educators and/or providers of professional development to adequately teach into these still-new, time-space dimensions of possibility. Each of the three components that Beach (2012) advises--content-focused, reflectivity-encouraged, and collaboration-supported--is emblematic of best practices in teaching and learning. Thus, the goal of this chapter is to share ways in which undergraduate and graduate students--preservice and practicing teachers--were able to engage with content, reflect on their own experiences, and take up opportunities to collaborate that the Twitter synchronous chats in which they participated, afforded them.

UNIVERSITY STUDENTS' EXPERIENCE WITH TWITTER CHATS

Method

The authors of this chapter utilized Twitter in required assignments for two courses during 2017. Using a mixed methods (Creswell, 2018), multiple case study (Stake, 2006) approach, examined were ways in which Twitter was used by existing teachers (n=47) for Case One, and by prospective teachers (n=18) for Case Two to globally connect, share, and collaborate with professionals in their fields. Both classes were held in a regional, public university in the southern United States that serves a largely rural population. Faculty from technology and reading used retrospective

course data, using only pseudonyms for all people and place names, to ask how synchronous use of Twitter, in the form of scheduled chats among educators, connected university students (N=65) to local, national, and international professional educators who share similar interests and goals. The researchers also examined both the challenges and benefits, to students, of using Twitter synchronously in order to make professional connections. Data were gathered from pre and posttests, five weekly student chat journals, five weekly reflections, and post reflections. Data analysis included descriptive statistics, and inductive methods to generate codes and themes using content analysis (Krippendorf, 2013). For the qualitative data, a codebook was generated, with codes, keywords, memos, and exemplar data excerpts in order to enable the investigators to achieve inter-rater reliability. In this way, the researchers were able to determine the most robust themes from the data set of which are presented below, by cases.

The research questions that were considered included:

- What were students' experiences and attitudes around the usability of Twitter chats for professional learning and/or networking?
- In what ways did Twitter enhance or detract from students' course learning experiences?
- How were students able to develop and/or join a professional learning network using Twitter?

Case One: Using Twitter in a Graduate Technology Course

Initially, when graduate students who were enrolled in an online technology course were asked to participate in a series of five Twitter chats during the semester, the responses were mixed. The primary themes that resonated from the post-test and reflections were those of *overwhelming, fast-paced, complicated*, *unavailable*, and an overall *unawareness*. For example, students reported, "I don't understand how people keep up with it all" and "The best way to describe this [first] week's Twitter chat is o*h my good gracious gravy*… This is not at all good. I had no idea what I was doing or what to expect."

Other students noted that they were unaware that Twitter could be used to make professional connections with other educators. One student stated, "I hadn't used it for anything other than socializing and reading the news." Another student remarked, "I honestly thought it was for teenagers...I was very surprised by how many adult professionals use it to discuss important issues such as education and assistive technology." In addition, although students were given a preliminary list of chats, chat schedule, topic of discussion, time, day of the week, and description of the chat,

not all chats were active and others were reported to be *unavailable*. For example, a student stated, "I tried over 10 different twitter chats this week to no avail."

Although many students expressed some anxiety during their first chats, their perceptions of Twitter improved with each chat. For example, one student stated, "When I started this class a week ago, I only followed maybe five people. I am currently following 167 people and have 50 followers. I am slowly learning how to use Twitter." In fact, after the conclusion of the final Twitter chat, 85% of post-test responses highlighted that the overall experience exceeded the majority of the students' initial views of the social platform.

In terms of learning, 79% of the students perceived Twitter to have enhanced their course learning experience. The students reported that they had gained new *information* as well as valuable *resources* to use in their classrooms (see Figure 1). As an example, one student acknowledged in her reflection that "Participating in [the chat] was an eye-opening experience for me… Not only did I learn how to attend a twitter chat, I also realized that these digital meetings can yield an abundance of new information." Another student stated, "After eight tweets, 2 additional followers and gaining information on the usability of Chromebooks, I found #edtechchat to be a successful learning experience!" One student even connected the experience with the content of the course: "This is definitely educating me on the new learning experience that is discussed in our textbooks and how a group of like-minded people can work together to educate each other on differing topics."

Students reported that they used Twitter to collaborate with both professional educators and university students (see Table 1). For example, a student shared, "I like that other educators are there to help when needed and want to help." The students reported spending an average of one to two hours per week chatting with experts in their fields. In addition, some students used Twitter for employment opportunities (see Table 1).

Moreover, 94% of students documented that they would continue having synchronous chats after graduation and 91% reported that they would continue to use Twitter after the course to build their professional learning community. Only a small percentage (6%) of students reported that it was not an experience that they would continue. For instance, one student remarked that Twitter was "full of fake news and brain junk food".
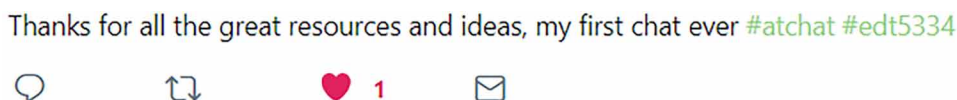
Figure 1. First Twitter chat experience

Thanks for all the great resources and ideas, my first chat ever #atchat #edt5334

Table 1. Excerpts from teacher collaborations

Collaborations With Professional Educators	Collaborations With Students	Collaborations With Employers
It really is a wonderful way to connect with other educators and see what others are doing.	I enjoyed how it connected peers in the same profession to discuss relevant topics.	I tweeted about an interview and a job position.
It's a great way to collaborate with other educators and innovators.	I have followed them and read and liked their tweets!	
We were encouraged to share something our students created this year. I shared pictures of what my first-grade students had created that week.	We helped each other find twitter chats that we enjoyed or thought they would like.	

In this case, the students reported that as they became more comfortable with Twitter, they followed more individuals, tweeted more often, and shared information and resources. For example, one student reflected:

If you'll remember, I was intimidated by the speed and number of people in the chat last week. But this week I held my own. I felt like an expert! I got retweeted, and two people followed me! That probably isn't remarkable, but it made me feel like I belonged.

The need to belong plays a significant role in establishing a community of learners. These findings coincide with earlier research that confirmed an association between belongingness, social presence, and learning. For example, Dunlap & Lowenthal (2009) acknowledged that synchronous online learning is only effective if it also facilitates opportunities for students to connect and learn through social interactions with others.

Case Two: Reading

From this required, undergraduate disciplinary literacy course for preservice secondary educators, two main themes emerged from students' experiences with educational Twitter chats: ways in which they were able to ascertain their social presence; and ways in which they could manage engagement of their future K12 students through finding techniques and advice on the chats to help them establish positive student-teacher relationships and finding ready and useful teaching tips.

Some students, especially in the early weeks, found the rapid-fire nature of the synchronous chat challenging. For example: "I find Twitter difficult to navigate and just have never really latched onto this form of social media" (Barb, Twitter

1). Despite her best efforts to participate in a second chat, another student shared a similar experience where her presence was not acknowledged in any validating way: "I found a pretty good article and shared it to the page as well as posted quite a few questions such as 'what are some tips you can give a first-time teacher?'. Again, no one responded to any of my tweets, which made me pretty sad" (Olivia, Twitter 2). This theme is reflected, again, in the following example, where this student managed her social presence better than in the first week's chat:

I felt like I got a lot more out of this experience than I did last week, which is exciting! Once I introduced myself in the chat, I was surprised to see a few other educators from the Hometown area post their introductions as well! The chat moved so fast that I completely forgot to go back and follow them, but I am looking forward to keeping a look out in the future for people from my area. (Lacey, Twitter 2)

Moreover, Lacey became aware that other educators in the area were on Twitter and seemed excited about networking with them by following them on Twitter. To her credit, Olivia managed to persist, and in Week 3, her excitement reflects a sense of validation: "For the first time, one of my questions was pretty popular which is SUPER EXCITING!" (Olivia, Twitter 3). The experiences of Barb, Olivia, and Lacey were not unusual. As time passed, students' social presence on the medium became more evident as they developed more pointed questions, responded more to others' tweets including attaching images and links, and, found and followed with increasing enthusiasm other educators in the chat.

Foremost in many of the university students' minds was concern about finding ways to engage their K12 students by forming positive relationships with them and using activities both intellectually rich and enjoyable. A recurring theme for Edgar, relationships mattered:

As teachers we should know each and every one of our students personally when it comes to our job…. I loved those teachers who were interested and keeping me involved in class whether I was learning or not. I can tell you that English was my worst and most hated subject until I found that one teacher who cared so much about her job and students that I grew to like English (Edgar, Twitter 2 & 3).

Drawing on their own past experiences helped some preservice teachers connect to content on the Twitter chats and imagine their future selves helping actual students. Again, Edgar extended this point, between relationship and student learning, as he looked into his prospective classroom: "Teachers [need to] be engaged in the activity as well. The teacher must get the students to own the entire process rather

than to simply pick a task. Otherwise there is no purpose and meaning behind it for them" (Edgar, Twitter 3).

The practical concerns of engagement were present in the Twitter chats. Some preservice teachers spoke in general terms such as "how to get students encouraged and motivated to read on their own" (Greg, Twitter 4). And, "During this week I picked up a lot of useful tips of tuning and how students can train their ears to gain perfect pitch" (Donald, Twitter 4). But most students zeroed in on specifics. One future English teacher was even thinking cross-disciplinarily: "I learned [about] a graphic that made a lot of sense…Even though I think it is for another discipline, I feel that it can be applied throughout education" (Fern, Twitter 1). Isabelle seemed to be alluding to her own wise stockpiling of resources like "contemporary fiction, nonfiction texts related to current issues and/or topics of interest, and videos, photos, and infographics for their students to read" (Isabelle, Twitter 4). And, aware of the need for immediate feedback connected to content connected to developmentally appropriate learning materials, Charles thought out loud, on paper, about how he "would like to use the Tonal Energy as my tuning app so the kids can see the smiley face when they are in tune" (Charles, Twitter 1).

Thus, across time, preservice teachers' sense of social presence and within that, a sense of belonging in the chats became more evident. Many spoke about following interesting educators locally, nationally, and even globally. And, preservice teachers found that the chats bolstered their sense of what building healthy relationships means between teachers and students, and how that always cycles back to student engagement and learning. Finally, preservice teachers found the chats to be worth their time and effort by providing them with handy resources for their own continued development as teachers.

DISCUSSION

Both practicing teachers and preservice teachers experienced stress over the new, fast-paced virtual environment that Twitter chats demanded. Requiring university students to engage in five weeks of educational chats, however, provided enough time for to acclimate to the new, virtual, and synchronous environment. Overall, students were able to achieve and maintain a degree of social presence, coming across as approachable "real people" (Garrison, Anderson, & Archer, 2000), with fellow-travelers on "the road" (Bakhtin, 2002), inside educational Twitter chats in which they participated. Lacey expressed it well: "I was getting more likes than I have before and even some educators retweeting me, which felt very validating." Student comments such as this showed awareness of participating, if somewhat

tentatively, in a professional community. Twitter encouraged additional learner-learner interactions among and between students creating a "culture of engagement" (Junco et al., 2010). Thus, this study indicated that the synchronous "real-time" nature of Twitter enhanced social presence, as students were able to become part of an even greater community of learners.

Students were given the freedom to collaborate with and learn from those with similar interests in informal learning environments at various days and times, in the manner of (Visser, Evering, & Barrett, 2014). That such networking possibilities are free, loosely regulated, and do not require transportation nor incur logistical costs, points to participation in these chats as a significant means by which teachers, at any stage of their careers, can engage in professional learning and networking. Consistent with previous studies, using informal digital spaces like Twitter promoted the active participation of educator communities, developed social presence, and reshaped the way many of our students learned (see Lave & Wenger, 1991; Lord & Lomicka, 2014; Pacansky-Brock, 2013).

In order to help university students experience success with Twitter chats, educators should teach them about Twitter, explain terminology, discuss chat etiquette, and allow time for students to both set up accounts and follow each other and the instructor. As well, using a distinct hashtag (e.g. #EDU5678) that everyone in the class uses for each tweet in a given chat, creates a sense of accountability. It also allows for accurate assessment of students' participation in chats. Furthermore, in creating a well-designed assignment with clear expectations (e.g. four comments and one question per one-hour chat per week and a learning reflection), teacher educators can better support students as they venture into the Twitter-verse. Instructors should explain the rationale and possible benefits behind the assignment in order to balance the sense of risk that students might feel. Lastly, it may be beneficial to create an initial chat to allow students the opportunity to practice using Twitter before students interact with outside members of the social network in order to eliminate some of the stressors that were evident in the initial reflections.

FUTURE RESEARCH DIRECTIONS

Future research could investigate various aspects of what students reported. For example, following a sub-group of students who exhibited persistence across the chats could reveal dispositional inclinations that may or may not have to do with digital acumen. Another possible area to explore is whether teachers who continue for one, two, three, or more years feel more agency vis-à-vis connection to their own profession, sense of control over their own professional development, and ability to go outside of school walls for generative conversations. As students become

more aware and comfortable with the potential of Twitter, they may increase their use of the platform, sharing additional resources, while developing a larger virtual community. Such a longitudinal approach may allow for a better understanding of how such professional networks might influence classroom teachers' self-efficacy, lessen social isolation, and perhaps impact teacher retention. Lastly, and perhaps, most importantly, it would be interesting to follow a group of teachers, across grades and disciplines, to see whether and how student learning outcomes could be related to teachers' consistent participation in various educational Twitter chats.

CONCLUSION

Overall, this study highlighted that there are both positive and negative responses in regards to students' attitudes regarding the usability of Twitter as a networking and professional learning tool. However, the synchronous Twitter chats were shown to enhance university students' course experiences and encourage new ideas for professional growth. The study indicated that social media platforms like Twitter can help students find and share resources while establishing a professional learning network as noted by the following statement "If I have learned anything from just these two chats, it is that the more we collaborate, the better we can make the education world for us and our students."

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KEY TERMS AND DEFINITIONS

Asynchronous: Communication that is not occurring in "real-time" such as email and texting.

Hashtag (#): The # sign added to a word or phrase.

Microblog: A blog or update, usually posted online, where users share short text messages, images, video, and hyperlinks.

Professional Learning Network (PLN): A community of individuals who share like interests and learn from one another.

Social Media: Online tool or platform that allows users to communicate and share interests with others.

Synchronous: Real-time communication such as instant messaging and video conferencing.

Tweet: A short text message of up to 280 characters shared on the social media platform Twitter.

Twitter: A social media platform where people communicate with one another using 280-character tweets, images, videos, and hashtags.