# Making and Missing Connections: Exploring Twitter Chats as a Learning Tool in a Preservice Teacher Education Course

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Research on social media use in education indicates that network-based connections can enable powerful teacher learning opportunities. Using a connectivist theoretical framework (Siemens, 2005), this study focuses on secondary teacher candidates (TCs) who completed, archived, and reflected upon 1-hour Twitter chats ($N = 39$) to explore the promise and pitfalls in integrating optional Twitter chats as a professional learning and networking tool in a semester-long teacher education course. While many TCs reported that their Twitter chat experiences allowed them to bridge physical and experiential distance and benefit from educator networks, some TCs experienced miscues that left them feeling on the periphery of these chats, able to gather resources but not to establish a sense of connection. For most participating TCs, their Twitter chat experience changed their perspectives toward Twitter as a professional learning tool, opening the door to future exploration of Twitter as a tool for professional networking. The results of this study indicate the promise of integrating Twitter chats as a professional learning tool, but also demonstrate the importance of anticipating common miscues and explicitly addressing the nature, structure, and purpose of Twitter chats to strengthen opportunities for TCs to establish ongoing professional connections using this medium.

Despite the rising popularity of social networking, educators may not see the potential of social networking as a professional tool. In a 2015 Pew Research Center survey, nearly two thirds of American adults (65%) reported using social networking sites, up from just 7% in 2005 (Perrin, 2015).

Among educators, 80% use social media for personal use, with 47% of those educators expressing awareness of the potential of social media platforms to enhance their students' education. However, fewer than 20% report using social media in the classroom, and 34% have reported difficulties when students or parents try to connect with them using social media (Bidwell, 2014).

While attention is often focused on educators' use of social media in the classroom or its use as a tool to facilitate communication with students and families, the potential impact of social media in education is not solely limited to these applications. Beyond these purposes, an emerging field of scholarship has begun looking at the role of social media as a professional learning tool to promote professional networking among educators (Carpenter & Krutka, 2014, 2015; Hur & Brush, 2009). This research indicates the promise of participating in online spaces for teacher learning, connecting with other educators, and exploring new ideas with a degree of anonymity which, paradoxically, allows for teachers to seek resources and support more openly (Hur & Brush, 2009).

The establishment of positive professional interactions with other educators, particularly for early career teachers, has been cited as a factor in promoting retention (Nieto, 2003) and countering norms of isolation that many new teachers experience (Carpenter & Krutka, 2014; Cochran-Smith, 2004). The goal of this study is to explore teacher candidates' (TCs') participation in a professional Twitter chat as part of a semester-long teacher education course. We sought to gain insight for teacher educators on the promise and pitfalls of integrating a Twitter chat to introduce TCs to the notion of professional networking.

## Twitter as a Tool in Education and Teacher Education

Among all adult users of social media, 23% reported using Twitter in 2014 (Dugan, Ellison, Lampe, Lenhart, & Madden, 2015). In 2017, the number of monthly active users of Twitter worldwide was recorded as 328 million, with 100 million daily users of the platform (Aslam, 2017). Twitter is a microblogging social media platform that limits user posts ("tweets") to 140-characters, using a system of "hashtags" (denoted by the character "#" symbol) as a search feature, and an account handle beginning with "@" attached to a username in order to direct tweets or mention particular users in a tweet (Twitter, 2016).

In only 1 year (2013-2014) in the U.S., Twitter had a 12% increase in use among adult Internet users with a baccalaureate degree or higher, with a total of 30% of users in that subgroup reporting use of the platform (Dugan et al., 2014). Although specific statistics regarding educator use of Twitter have not been released, professional organizations including the National Education Association (NEA, 2015) and the Association for Supervision and Curriculum Development (ASCD; Ferriter, 2010) have published articles encouraging educators to consider using Twitter. Twitter itself, in collaboration with others, has put together resources to support teacher use and integration of Twitter for educational purposes (Twitter Trust and Safety Team, KQED, Levin, Morris, & Williams, 2016).

While many of these resources focus on classroom use of Twitter, other educator resources focus on building and cultivating professional learning networks (PLNs) through Twitter (Scavitto, 2013;Whitby, 2013). PLNs, as a concept, likely originated from corporate organizational development literature (Digenti, 1999 as cited in Lalonde, 2009; Tobin, 1998), but they also have gained popularity in the educational world to help like-minded educators connect with one another. One argument made for using Twitter as a professional tool for educators is that the use of PLNs can potentially offer immediate, personalized opportunities for professional growth that are less restricted by time and

place than traditional in-person professional development sessions or courses (Carpenter & Krutka, 2014).

Twitter chats, the focus of this study, are virtual conversations that take place via Twitter, in which a group of people tweet about the same topic using a specific hashtag that allows the discussion to be followed on Twitter. Twitter chats happen at specific times, and often (although not always) repeat on a regular basis (Fouts, 2017). Twitter chats are often moderated by one or more facilitators and use a question-and-answer format to engage participants and maintain the conversation topic (Ward, 2017). Numerous Twitter chats specifically focused on education take place regularly, and participation in such Twitter chats can be used as a way to expand one's PLN or engage in professional learning (Ward, 2017). (For example, see https://sites.google.com/site/twittereducationchats/education-chat-calendar)

In a higher education context, Twitter has been shown to enhance active and informal learning, promoting engagement both in and beyond the classroom (Kassens-Noor, 2012); however, issues such as unreliable Internet access and resistance on the part of students require explicit pedagogical integration of Twitter and instructor support for students to develop Twitter related discourses appropriate for educational settings (Rinaldo, Tapp, & Laverie, 2011). Other studies in higher education settings have focused on the development of new literacies associated with the use of Twitter (Greenhow & Gleason, 2012; Nicholson & Galguera, 2013).

Literacies involved in negotiating social media platforms like Twitter have also been connected with traditional literacy practices with an emphasis on the importance of connecting in-school and nonschool literacy practices to establish a more nuanced understanding of the use of Twitter as literate practice (Greenhow & Gleason, 2012). Despite these connections, Twitter literacy scholars also highlight the need for explicit instruction in new literacies to create a context for social media interactions (Nicholson & Galguera, 2013).

Another emerging body of literature focuses on uses of Twitter as a learning tool in teacher education. In 2010, Wright examined whether Twitter helped teacher education students develop self-reflective practices. He noted that, while participants initially found the 140-character limit difficult and limiting, they eventually believed it honed their reflective thinking skills and helped them feel that their thoughts were highly valued, leading to a reduction in feelings of isolation and emotional overload.

While Wright conducted his study with a small, private practicum group, he found microblogging to be a powerful tool to promote connection within the group. Similarly, Mills (2014) examined the use of Twitter as a communication and professional learning tool during preservice TCs' internship periods. This study focused on Twitter as a one-way vehicle for the teacher educator in the study to provide informal professional development resources to TCs during an internship rather than as a tool for ongoing bidirectional communication between instructor and TCs. Mills highlighted Twitter as a way to address TCs' specific and immediate needs. Although not the focus of the study, Twitter also proved to be a tool for TCs to connect with other educators in their cohort as challenges arose in their own classroom.

Finally, most closely related to this current study is a recent study done by Carpenter (2015) of a small cohort ($N = 20$) of his undergraduate preservice teacher candidates and their use of Twitter during his preservice course. Following the course, students completed a survey about Twitter. In Carpenter's study, the TCs noted several benefits to the use of Twitter, including resource sharing, communication, and connection to educators both in and

outside of class. Despite their positive sense of Twitter as a professional learning tool, however, as Carpenter tracked participation in the semester following the course a majority of students stopped using Twitter, reportedly due to a lack of time.

Taken as a whole, several themes emerge from the literature around Twitter as a tool in higher education and teacher education. Twitter has been found to benefit parties involved by providing resources and allowing educators to engage with one another. However, using Twitter for educational purposes often engenders skepticism from students. The features of the platform may also overwhelm new users.

For these reasons, teacher educators interested in using Twitter in a preservice setting should consider the new forms of literacy necessary for effective use. They should explicitly model Twitter use and have a clear rationale for using this platform in developing TCs' professional practice. Instead of focusing on the use of Twitter generally as a social media tool, the current study provides a snapshot of a particular type of Twitter interaction (Twitter chats) as a professional learning tool to promote TCs' connection and engagement with other professionals around topics of interest.

## Theoretical Framework: Connectivism

Connectivism theory (Siemens, 2005) is based on the idea of learning from networks, or other loose connections between people with similar interests and knowledge, in somewhat unpredictable or random ways. When engaging in connectivist learning, participants must actively consider the many opinions expressed in these networks and determine which other participants might best enhance their professional learning.

Twitter chatting invokes principles of *connectivism,* specifically in relation to learning as a continual process that can often occur through informal work-based relationships and technology. The continual process of learning is evident as participants negotiate what chats to participate in, who to connect with during the chat (and stay connected with after the chat), and how to participate (e.g., replying only to facilitated question or also engaging in side conversations based on one's responses).

Within a Twitter chat, participants must be able to connect with the concepts explored and communicate about the topic at hand, drawing from their knowledge base and experiences, if they wish to respond to, engage with, and learn from others. Through engaged conversations, social networks can form hubs of well-connected individuals that also may promote a wealth of continuous knowledge and learning if connections are maintained (Siemens, 2005). However, the starting point of connectivist learning is the individual who both contributes and gains knowledge from the other members of the network.

## Methodology

In this study, I examined the experiences of a group of secondary preservice teacher candidates ($N = 38$) who followed various Twitter hashtags for 1 hour and then reflected upon these experiences in a brief written reflection. The study examines the following research questions:

- What benefits and challenges do TCs experience when exploring Twitter chats as a professional learning opportunity?

- How can TCs' participation in Twitter chats provide insight to teacher educators about the integration of Twitter chats into the teacher education classroom, as a form of professional learning?

Participants were all enrolled in my postbaccalaureate preservice teacher education course on secondary literacy at a large, public university in the southwest region of the United States. Participants were single-subject credential candidates from a variety of fields, including social studies, English, math, science, music, and physical education, and were purposefully sampled from students who took this course over four semesters based on their choice to participate in a "Twitter chat" as part of the course requirements (see Table 1).

Participants who elected to complete this option were given a reference list of potential education related chats with times and asked to choose a relevant chat to follow, participate in the 1-hour synchronous chat by introducing themselves and tweeting at least one other time during the chat.

The number of tweeters in the chat and accuracy of the chat list varied in relation to each chat, as the chat list was Internet-based and not always current. Student participants were then asked to archive the chat via Storify ([www.storify.com)](www.storify.com) and write a two-page reflection. Reflections focused on TCs' experiences during the chat process, what they learned from participating in the chat or the relationship between literacy, professional development, and Twitter chatting. The reflections from each TC following their participation constituted the main data source for analysis in this study although, where relevant, the Storify archive was used to triangulate and confirm references by candidates.

Data were analyzed in several phases using open descriptive coding cycles (Saldana, 2012) of participant reflections as the primary unit of analysis. I first engaged in open coding, reading through all participant reflections, highlighting ideas, and noting themes from the reflections that might contribute to the knowledge of teacher educators of the value of participation in relation to Twitter chats (aligned with the two research questions). These memos were then used to generate codes according to emergent themes in the data, and axial coding (as in Saldaña, 2012) was completed in order to refine themes and classify TC data according to these themes. Relevant initial codes for this study included Resources, Application, Exploration, Peripheral Participation, and New Experiences With Twitter.

After initial coding, the quotes selected for various categories were combined into themes that demonstrated trends among the participant TCs. Archival data from the Storify portion of the assignment was used to analyze participation in the chat and to cross-reference experiences mentioned in TC reflections. Positive themes that emerged related to new connections, both interpersonal and professional (e.g., so-called A-ha! moments), and to the utility of Twitter as a professional tool. However, other themes related to the need to navigate through potential miscues also arose.

According to the TCs, the navigational barriers sometimes left them feeling disengaged or on the periphery of an established professional community. The data presented give multiple examples of quotes in relevant coding categories. Then a brief case study of several individual students and their experiences with their Twitter chats is featured to illustrate more descriptively the ways in which each theme impacted individual TCs in terms of their professional perspectives.

**Table 1**
Study Sample by Pseudonym, Content Area and Chat

| Pseudonym | Content Area | Hashtag/Chat Followed |
|---|---|---|
| Melanie | Art | #k12artchat |
| Lia | Art | #edchat |
| Lily | Chemistry | #ngsschat |
| Allyson | English | #engchat |
| Dale | English | #techeducator |
| Donna | English | #IEedchat |
| Kim | English | #Moedchat |
| Holly | English | #sunchat |
| Jade | English | #edchat* |
| Kylie | English | #engchat |
| Mal | English | #ntchat |
| Yoli | English | #COLchat |
| Alex | History | #sschat |
| Brie | History | #dtK12chat |
| Bill | History | #sschat |
| Andy | History | #sschat |
| Chuck | History | #educoach* |
| Ed | History | #Edtechchat |
| Jamie | History | #txhsfbchat |
| Jack | History | #sigtec |
| Alejandro | History | #edchat* |
| Laura | History | #engsschat |
| Louis | History | #satchat |
| Jose | Math | #mathchat* |
| Joel | Math | #sblchat #ntchat #edchat |
| Katie | Math | #gtchat |
| Andrew | Music | #edchat* |
| Emily | Music | #musedchat |
| Elizabeth | PE | #satchat |

| Rosie | PE | #Artsed |
| Norman | PE | #reflectiveteacher |
| Monica | PE | #reflectiveteacher |
| Lena | Science | #christianeducators |
| Erin | Science | #gtchat |
| George | Science | #edbean |
| Carol | Science | #Nt2t |
| Valerie | Science | #spedchat #connectEDTL |
| Julieta | Spanish | #ellchat |

## Limitations

While this study has several potentially important implications for educators, particularly teacher educators, in relation to the use of Twitter chats as a social networking tool, it is limited in its scope and in the sampling methods used for participants and, therefore, in its generalizability. A relatively small number of student data were examined ($N = 39$), and these came from students who self-selected to participate in Twitter chats among several options for a particular course assignment. Given TCs' self-selection of this option, the data may be biased toward a positive evaluation of Twitter as a tool in professional learning, particularly because it was part of a class assignment. Further, given that these data were collected as part of a course in which I was professor and am active on Twitter, TCs may have felt that it would benefit them to speak well of their experiences in Twitter chats.

Finally, the focus on a single Twitter experience for TCs limited the scope of the study. Follow-up studies would be necessary to examine the use of Twitter as an ongoing professional development tool. Despite these limitations, this study explores the ways in which participation occurred during the chats as a way of providing insight on this medium within a teacher education context.

## Findings

Twitter chat experiences and participation varied among TC participants. For some TCs, difficulties with the chat process left them feeling like outsiders during the chat. Several TCs struggled to find a chat that was actually occurring during the stated time on the Twitter chat list. Others ended up only following hashtags (rather than actually engaging in a synchronous chat process), and some struggled with privacy settings that left them feeling "invisible," as others in the chat could not see their tweets.

A few who actually participated in chats felt that they didn't have a lot to contribute because of lack of knowledge or professional experiences. When TCs experienced initial difficulties with their Twitter chat experiences, it was possible for them to find Twitter chatting valuable and productive; however, reshaping these initial struggles took additional efforts and commitment on the part of both the TC and the instructor.

Despite these challenges, the Twitter chat experience reshaped many TCs' understanding about the utility of Twitter as a professional resource. Many TCs reported that Twitter chats

constituted a way for them to build professional networks and engage with other educators in ways distinct from those they might find within the credential program. TCs explicitly discussed using Twitter Chats to connect with educators in their field who might not be local and to get advice from more experienced educators. They also expressed a desire to continue participating in Twitter chats as they moved into their own classrooms and careers.

## The Struggle to Participate: When Candidates Felt Like Outsiders

Participation in the Twitter chat process varied among TCs. Twenty-eight percent of TC participants (*N* =11) expressed a sense of feeling on the periphery or unable to fully participate in their Twitter chats. When this happened, often TCs either suffered from technical miscues (of which they sometimes were not aware, even after the chat ended and they submitted their reflection) or from a sense that their lack of classroom experience or particular knowledge meant that they could not fully participate in the dialogue. Troubleshooting these issues in advance of the chat was difficult, and TC reflections indicated that several were not clear as to what the purpose or format of chat was and what had gone wrong.

Table 2 lists some of the common issues that candidates expressed in relation to peripheral participation. Exploring these various miscues and missed opportunities for connected engagement is essential in supporting teacher educators to integrate Twitter chats more effectively as a tool for professional learning.

***Technical Miscues: Experiences on the Forced Periphery.*** Technical miscues were an important factor that mediated TC experiences with the chats. Among logistical miscues that occurred, TCs were most often unable to fully participate because of timing and privacy issues. In relation to timing, several students either did not have the correct time for the Twitter chat they sought to follow or the chat they chose had been discontinued. (Given the ever-evolving nature of Twitter, the list provided to TCs at the beginning of the semester inevitably contained some chats that were not meeting on given weeks or had changed times of been discontinued.)

These students expressed frustration at not being able to find a chat in which to participate in or at coming into a chat at the incorrect time. Other students chose a hashtag to follow, which had active tweeters using it (e.g., #engchat, #edchat, or #sschat) even though it was not the designated time for facilitated conversations. (Often, on Twitter, popular educationally related hashtags will be used outside of the designated chat time in order to share resources of interest.) Jose and Monica's comments in Table 2 reflect this type of technical miscue, as both followed active hashtags for 1 hour when no facilitated conversation was taking place, leading to a sense that this network lacked community. In fact, the lack of engagement was related to a miscommunication or misunderstanding related to chat times.

Another technical issue that forced students to remain on the periphery of the Twitter chat community was that of privacy settings. TCs in the course were allowed to create public or private Twitter accounts, so long as they followed the instructor and all the other students in the course. However, in a Twitter chat, if one's settings are private, only followers are able to see that participant's tweets (or statements), making it difficult to engage in an open chat format.

**Table 2**
Selected Participant Quotes Related to Participation Difficulties [Emphasis added]

| Participation affected by technical miscues | "Even though it had many advantages, I found one complaint. ***Nobody talks to each other. Everyone just posts information regarding math, but nobody comments on anyone's posts***." (Jose-Math: 10/21/13 Postchat reflection lines 52-54) |
| --- | --- |
| | "What I learned was that ***even though everyone is able to freely express their thoughts on the topic many of the people participating don't interact with others and just focus on putting their ideas out there for everyone to see***. It is great that they are willing to participate but I feel that they should be giving some type of feedback to others that way everyone can benefit from being a part of the discussion." (Monica-PE: 4/15/15 Postchat reflection lines 20-22) |
| | "The lesson of the day was 'technology is technology' and for whatever reason, ***my posts were not making it into Twitter chat for others to see and respond to***. As I read through and tried to work out the technological problems, I watched as questions and ideas passed by which both got me nodding and begged for my critique. I went from thinking I would choose to mostly passively observe to being forced to." (Andy-Social Studies: 4/18/14 Postchat reflection lines 11-16) |
| Participation affected by lack of experience | "I was personally not able to participate in the chat because ***I do not have a classroom or extensive experience trying to teach controversial or multicultural diverse curriculums.***" (Alex-Social Studies-10/17/14: Post-chat reflection lines 31-33) |
| | "The questions focused on people sharing experiences and ideas about implementing the NGSS, so ***I felt like I didn't have enough background experience to contribute anything to answering the set questions.***" (Lily-Chemistry: 4/16/15 Postchat reflection lines 27-29) |

Andy's quote in Table 2 was a particularly clear example of this issue. He initially intended only to observe the conversation. As the Twitter chat progressed, Andy became frustrated as he tried to engage in the chat but did not realize that because of his privacy settings other participants could not see his tweets. He was relegated to the periphery even as he sought to participate.

Andy's sense of frustration mounted as the conversation continued and he ended up spending his chat time working on "technological problems" rather than actually responding to intriguing posts in the chat itself. He felt "forced" to stay out of the conversation, limiting potentially interesting interactions for Andy and instead leaving him as an observer, not a participant.

Technical miscues related to chat format and privacy settings both undermined active connectivist learning principles within Twitter chats. While TCs were still able to form connections based on the resources being tweeted by others, they did not feel like active contributors, nor did they feel connected to other participants. The miscues led to TCs feeling ignored and unheard, taking away from the synergy of learning within a connectivist network.

***Peripheral Participation: Feeling Like a Novice.*** Aside from technical miscues, another theme relevant to peripheral participation was the idea of a lack of experience or knowledge. While some TCs were able to bridge this initial hesitance due to lack of experience or knowledge, many held back in their participation or felt that they could not fully participate because they were not yet in the classroom and lacked either specific experience or knowledge.

Lily, a chemistry TC, cited her lack of experience as mitigating her participation in a chat about the *Next Generation Science Standards* (NGSS Lead States, 2013)**,** as noted in Table 2. Given that this particular chat centered around implementation and Lily had not yet taught or student taught, she felt that her experiences did not fit into the predetermined questions for the chat. Lily had experiences related to the standards, in tutoring and preservice coursework, but she did not feel that these experiences would have contributed to the greater understanding in the network created by the Twitter chat participants. This circumstance led her to a more passive, rather than active, role in the chat.

Andy's quote in Table 2 illuminates a similar issue in which his coursework on multicultural education did not seem sufficient enough to contribute to a conversation based around teaching controversial curriculum. Given Siemens's (2005) notion that the individual is at the heart of connectivist learning, this disconnect between personal experiences and professional contribution held both Lily and Andy back from the full benefit of their potential Twitter chats.

***Vignette 1: Making Meaning From the Periphery and the Importance of Persistence.*** Like several of her colleagues, Mallory, an English candidate, experienced a frustration of feeling like an outsider or nonparticipant in the Twitter chat:

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

Like Andy, although Mallory actively tried to engage in the conversation, having a private Twitter account emerged as one barrier to participating fully in the Twitter chat. Mallory sought to respond and engage but was discouraged by the lack of responses and inability to communicate with others in the chat. Although the lack of response to Mallory's tweets was a result her privacy settings, she initially made the assumption that her relegation to the periphery of the conversation was caused by her lack of classroom experience. She was left frustrated and feeling like a failure, as she stated later in her reflection.

Fortunately, Mallory messaged the instructor after her first Twitter chat experience and was able to determine the issue of privacy settings as central to her frustration. Although only one chat was required for the assignment, Mallory was determined to have a meaningful Twitter chat experience. After several timing miscues and her initial privacy setting miscue, she found and participated in a chat about gifted students, noting that her experience "went well" and that she learned "more about [herself] as a future educator and

how much more [she] need[ed] to learn" (4/16/15 lines 37-38). While Mallory's level of perseverance was exceptional, two common themes in the data were perseverance in the face of initial difficulties in finding chats (*N* = 6; 15%) and perseverance with chats despite the overwhelming quantity and pacing of various chats (*N* = 14; 36%).

Mallory's final thoughts reflected connectivist learning principles, beyond the chat itself, as she found and connected themes related to struggle, perseverance, and learning through professional networks:

> I have slowly understood how Twitter can be used in the classroom as well as a tool for professional growth, and I will most likely use it for professional growth, since ***it has provided me with articles for resources, and support from teachers all over the country at any time of the day***. Even though this project was supposed to be the easiest because it wasn't time consuming, ***it was the most difficult for me because I had a hard time understanding the concept.*** I have ***always had an easy time learning in school, so I think it was beneficial to understand the frustration most students have***. I think learning how to use Twitter chat has helped me more as a future teacher than it might have been for other classmates, because it has taught me ***to have patience with learning, how to learn a concept in a way that is familiar, and to find different methods to achieve my goal. I will use Twitter chats often, and this time around I can pay more attention to the conversations than learning how to use Twitter.*** (4/16/15 Postchat reflection lines 53-64) [Emphasis added]

Mallory's experience demonstrated how the experience of a Twitter chat helped her revise her thinking around not only the use of Twitter in her classroom but also about professional learning, the frustration and perseverance in learning, and the importance of empathy as a learner. Mallory's case is important because it demonstrates that the concept of Twitter chats goes far beyond being able to tweet to gain and share resources. It is a form of networking and building upon the ideas of others. If Mallory had been satisfied with the resources that Twitter could provide her as an educator, she would have been content after her first chat experience; however, she persisted in looking for an experience of connected learning. This interest in ongoing participation within Twitter-based networks reflects the potential impact that the Twitter chat experience could have on these TCs.

## Evolving Notions of Learning: Reconceptualizing the Utility of Twitter

While many TCs struggled with the Twitter chat process, 53% (*N* = 26;) discussed Twitter chat participation as a new experience that helped them realize the potential of Twitter as a professional learning tool. Through their engagement in various chats, participants made new connections between social media and its utility as a teaching, learning, and networking resource.

***New Experiences With Twitter: Connecting Social Media With Learning.*** In their reflections, several students initially mentioned the use of Twitter exclusively as a tool to follow celebrities or live-tweet various events, while others characterized Twitter as "useless" or "meaningless." By using Twitter chats to engage actively as professionals on Twitter, TCs began seeing Twitter as a teaching, learning, and networking tool and reconceptualizing the purposes of social media in education. Examples from the coding categories related to new experiences and previous conceptions of Twitter are featured in Table 3:

**Table 3**
Selected Quotes Related to Twitter Chats as New Experiences [Emphasis added].

| Quotes related to Twitter chats as a new experience (General) | "I have **never used Twitter besides this class** so learning to use it was an interesting process." (Jose-Math: 10/21/13 Postchat reflection lines 5-6)<br><br>"***The use of Twitter Chat and Storify was something completely new that I have never used before***….I frequently get on Twitter to see the most recent news in politics because I follow the current Congressmen and women. ***I was not aware of how active Twitter can actually be.***" (Ava-Social Studies: 4/22/14 Postchat reflection lines 6-14)<br><br>"***This experience using first, Twitter chat, was a real eye opener to the possibilities it can lead to for me as a future teacher.***" (Jack-Social Studies: 11/26/13 Postchat reflection lines 7-8) |
|---|---|
| Quotes related to Twitter chats as a new experience w/ specific connections to teaching, learning, networking and professional development | "This experience has definitely ***opened my eyes to the benefits of using Twitter***. I have been able to ***connect with new people*** and ***inspired to create lessons*** that incorporate new mediums and techniques. I think Twitter provides ***easy accessibility to a vast amount of information and resources***." (Melanie-Art: 11/23/15 Postchat reflection lines 31-35)<br><br>"During my undergraduate experience, ***Twitter was an application that I found confusing and meaningless;*** however this class helped me to ***connect with Twitter at a professional level and understand some of the benefits of the application. As a first time user, I found Twitter chat an excellent opportunity to network and to connect with people from all over the world within seconds.***" (Julieta-Spanish: 4/13/15 Postchat reflection lines 3-7)<br><br>"I honestly was turned off to Twitter before this experience. ***I did not understand the point of tweeting and why Twitter existed. Now that I have participated in a Twitter chat, I have a new outlook on it. I think Twitter is a valuable tool for networking and a great resource for new ideas that relate to education*** (and probably many other ideas if I search for it)" (Kim-English: 11/19/15 Postchat reflection lines 15-18) |

For many of the TC participants, Twitter chats were a way to access a professional network of educators. During the chats, these educators on Twitter shared their experiences,

perspectives, and helpful resources. TCs walked away from the hour inspired by a sense of connection to other teachers and specific tools that they could use in their own classrooms. Being able to participate in a Twitter chat in a professional context helped TCs reframe Twitter as a possible tool to network with other educators and gain resources in their classroom. This reconceptualization represents professional learning directly connected with Twitter chat experiences.

***Vignette 2: New Perspectives Through Participation.*** Kim, an English TC whose quote is featured in Table 3, had a particularly transformational perspective in relation to her participation in a Twitter chat based on gratitude in relation to education. Kim began her reflection by noting that the chat was her "first time using Twitter extensively." Kim was reserved in person and did not often participate in whole-class discussions. She noted in her reflection that were it not for this assignment she never would have participated in a Twitter chat.

Initially, Kim was hesitant about her participation. She expressed concern about the chat being overwhelming and seemed unclear about the point of Twitter. Fortunately, Kim chose a smaller chat and was able to figure out quickly the interface of the platform. She became an active participant in the chat, retweeting and replying to people who had commented on her comments, both activities that were new for her.

Similar to the participant in Wright's (2010) study of teacher candidates, she initially found the 140-character limit constraining, but once she adapted to the discourse system and common abbreviations she saw in other participants' posts, Kim stated, "It was actually fun and challenging to get my point across in 140 characters or less!"

Kim characterized her overall experience as "positive," saying of other participants that they were "so nice, encouraging and positive." Kim also noted that she gained insight in how people show gratitude in school and professional settings (the topic of her chat) and that she was surprised about "how easy it was to connect to other people and be in a safe feeling environment."

This sense of safety and connection with fellow professionals that she had just met illustrates key principles of learning from like-minded professionals in a way that potentially opened the door to further experiences of learning through Twitter chats. Kim reported that she appreciated learning and seeing different perspectives from her fellow participants and emphasized both the resources gained and the power of professional networking.

Like Kim, many TCs found it easy to engage in the Twitter chat and even contribute, despite some initial hesitance and skepticism. Those who were highly engaged in the Twitter chats reported the welcoming environment as critical to their positive perception of the chat. Ten participants (26%) specifically referred to feeling welcomed, speaking of the positive nature of the chat and noting that other participants were "nice," "encouraging," "excited," "gracious," "insightful," and "willing to share." This positivity encouraged participants to share and led many of them to note that they would like to participate in Twitter chats again in the future. Kim's experience and the positive sense of belonging expressed by several of her TC colleagues illustrate the potential of a singular experience like this Twitter chat to change TC perspectives on Twitter as a networking tool.

## Twitter Chats as Bridges to Build New Connections

For many TCs, the Twitter chats served as opportunities to build professional connections. Participating in Twitter chats allowed many TCs to feel connected across geographic boundaries, despite different experience levels. While Twitter chats pushed TCs out of their comfort zones and into professional discourses with virtual strangers from across the country, these experiences also prompted them to examine their ideas about themselves as professionals and the ways they interacted with other professionals as a part of their growth and development.

***Twitter Chats as Bridging Distance.*** Nineteen of the participants (49%) discussed Twitter chats as a way to connect across physical distance and six others (15%) discussed Twitter chats as a way to bridge experiential distance. In characterizing Twitter chats as a way to bridge distance, candidates specifically spoke about the ideas of networking, providing support, sharing resources, and gaining additional insights. A few selected quotes from the teachers related to this theme are featured in Table 4.

Twitter chats allowed novices to find supportive individuals through extended networks who could provide resources and perspectives on practice as they enter the field. The general quotes from candidates reflect principles of connectivism, as TCs sorted through the input of various professionals around the world in relation to a particular topic and often prioritized the input of more veteran teachers who shared their experiences and insights.

***Vignette 3: Introducing a Missing Professional Community.*** Emily was an outgoing student from the music education program. Music education was one of the smaller programs on campus and was unique in that it was one of the few programs where students were interested in teaching at the K-12 level rather than only teaching secondary (grades 7-12) students. The small size of Emily's program meant that she often had few colleagues in her general secondary program classes and that many of the classes did not apply directly to her content area, given that professors rarely had disciplinary knowledge in music and focused on secondary level instruction more generally. These factors often led Emily to feel a sense of isolation in program classes.

In discussing the music education Twitter chat that she participated in, Emily noted how exciting it was to participate in a discussion with more veteran teachers, in her field:

> Seeing ***seasoned teachers*** talking about different apps and making smaller technological steps and additions in their own classrooms, caused me to feel better about the idea of making those steps myself. It helped me to see that we're all beginning this step forward together, and there are so many support systems to seek help from (11/19/13 Postchat reflection lines 27-31). [Emphasis added]

In these excerpts from her reflection, Emily explained how learning from more experienced music teachers was both exciting and comforting to her. She was excited that she was able to move beyond her smaller community of teacher candidates and her teacher education program to interact with veteran teachers in her field, around the world. She was comforted that, as she made small efforts to integrate technology into her music classroom, her more senior colleagues in music education were on the same path, and they could pursue this new journey together.

**Table 4**
Selected Quotes Related to Twitter Chats as a Way To Bridge Distance

| Quotes related to bridging physical distance | "I learned that there is a vast community of teachers **across the country** and **around the world** who promote better forms of education and who provide support for each other through the use of modern technology" (Andrew-Music: 11/26/13 Postchat reflection lines 42-45) |
|---|---|
| | "The Twitter chat was a great opportunity to network with educators from **different parts of the world**, gather different insights strategies and resources that teachers are implementing in their classroom." (Julieta-Spanish: 4/13/15 Postchat reflection lines 31-33) |
| | "Chatting allows teachers to connect with other professionals **regardless of the distance**. This is wonderful because **you may not have people with the same interests near you** so it makes it easy to access other professionals with similar interests, to get feedback and ask questions." (Carol-Science: 11/7/15 Postchat reflection lines 43-46) |
| Quotes related to bridging experiential distance | "I really appreciated reading tweets from professionals **because they have been in the field for a longer period of time and they shared insights** that I would not come across with when reading other articles online. There is also a sense of an organic feeling where I could interact with the thoughts and tweets of other people who share the same interests as me. The ideas that are tweeted also feel more personal because they are from real people." (Jack-Math: 12/10/13 Postchat reflection lines 10-15) |
| | "By using Twitter **it gives upcoming teachers an opportunity to communicate with** other young upcoming teachers and can work together because they might be going through the same things, or **older teachers with more experience and give input and assist** on what the upcoming teachers can do it improve and be successful in their class." (Monica-PE: 4/15/15 Postchat reflection lines 32-35) |
| | "This discussion allows **veteran teachers** to share some of their strategies that they use in their own classroom. **As a young teacher** this would be an excellent chance for you to express your thoughts and receive feedback on some of the strategies that you use in your classroom." (Norman-PE: 4/15/15 Postchat reflection lines 39-43) |

In the 1-hour Twitter chat that she engaged in, Emily found an additional support system of more veteran teachers in her field who were trying new ideas, something that encouraged her to do the same. The chat served as a way to bridge physical distance, introducing her to a network of music educators across the country.

***Vignette 4: Bridging Experiential Distance—Finding a Safe Place to Ask Questions.*** Unlike Emily, Louis came from one of the larger programs on campus: social

studies. Although he had a large group of social studies candidates that were also in classes with him, he seemed intimidated by his lack of experience with students and in classrooms and was not particularly social even with his content area peers.

As a quiet student, Louis sometimes seemed lost in class, but did not ask questions during the course lecture. One of Louis's field experience mentors noted that he needed support and guidance in order to feel more comfortable in working with students, even though it was clear that desire to teach was present and his content knowledge was strong.

Despite being different from Emily, Louis also emphasized the importance of Twitter chats as bridging physical and experiential distance. In discussing physical distance, Louis stated,

> I learned that Twitter chat was a great way for teachers ***around the world*** to interact with each other and learn about new ideas on how to improve teaching in our classrooms.... Twitter Chat helps teachers connect with other teachers. Teachers can then chat, ask questions and exchange ideas with each other. Many teachers on Twitter are from ***different states and countries***. (11/9/13 Postchat reflection lines 11-12, 62-64) [Emphasis added]

Louis noted twice in this short excerpt that expertise on the chat came from teachers around the world and provided opportunities to ask question and exchange ideas in order to learn new ideas for improving the classroom. Although Louis had plenty of colleagues around him, he valued the increased opportunity to engage with other teachers around the world to ask questions and exchange ideas. He emphasized the importance of connection and interaction.

Similar themes emerged when Louis discussed differences between experience levels:

> Twitter chat can be a useful tool for ***credential students*** to ask questions about the education system. There are many ***current high school teachers*** on Twitter that will give great ***advice and guidance***.... Twitter chat is a great way for ***incoming teachers to interact with actual teachers***. (11/9/13 Postchat reflection lines 13-16) [Emphasis added]

In this quote, Louis emphasized that Twitter chats can be used for TCs to ask questions and get advice and guidance from their more veteran peers. Twitter chats provided an avenue for a TC like Louis, who may have felt reluctant to ask questions of other candidates or even his professors, to benefit from being able to interact with more senior colleagues in a form of mentoring that occurred through the exchange of ideas.

Twitter chats also provided a safe space for Louis to ask questions that might be overlooked in a larger class setting. Given that the Twitter chats are designed to promote discussion around particular topics, Louis did not have to worry about being out of place if he had questions; he could collect ideas and resources from teachers around the world.

Unlike the aforementioned experiences of Lily, who found her lack of experience to limit her participation in Twitter chats, Louis's lack of professional experience was not a barrier to his participation in this setting. Their Twitter chat participation is an interesting contrast to these TCs' participation in face-to-face class sessions, where Lily was an avid contributor and Louis rarely spoke in class. Louis and Lily's different participation experiences may have been due to positioning. Louis felt safe to ask questions from experts, veteran teachers, and mentors, but worried about judgment from his peers; whereas Lily felt

confident in drawing from her tutoring experiences to contribute to her TC colleagues, but felt she could not contribute to the professional Twitter chat given her lack of classroom experience.

For both Louis and Emily, Twitter chats were perceived as authentic, relevant, safe spaces where they could engage in networks with more expert professionals in their fields. This circumstance allowed them to interact and connect, gain greater resources, and gain a greater sense of their professional selves, whether through trying similar strategies or asking questions that may not have been comfortable to ask in other settings. Emily and Louis used their Twitter chat experiences as ways to explore connections less accessible to them in their respective programs.

## Implications and Recommendations

This study has examined the engagement of a small focal group of TCs in at least one Twitter chat. Given the isolation often felt by new teachers entering the field, these informal networks potentially serve as important spaces for professional development and networking that support the transition of TCs from preservice credential programs through practicum and into the profession. Several important implications and recommendations for teacher educators can be taken from this study related to the importance of explicit and thoughtful opportunities to engage in Twitter chats during preservice coursework.

One critical implication is that virtual professional networks can serve as powerful resources for TCs as they enter the field. In their reflections, TCs noted how important the elements of networking, resource sharing, encouragement, and experience sharing were to helping them feel a part of their profession and encouraging their own growth and motivation in their chosen profession. Of the 39 TCs who chose to engage in Twitter chats as part of the course, 18 (46%) explicitly stated that they would like to or planned to engage in Twitter chats in some way as part of their ongoing professional practice.

A second, related implication is that the work done in preservice teacher education courses can have an ongoing impact on teacher practice and professional identity through platforms such as social media. To extend the impact of teacher education programs and given the limited time that TCs have in their preservice courses,, using tools such as Twitter chats can be a powerful way to establish and maintain connections among students, but more importantly, among like-minded professionals in the field. Twitter chats, as a platform, can emphasize professional dispositions such as ongoing reflection and professional growth. Using 21st-century tools like Twitter chats have the potential to promote more cohesive and coherent transitions related to professional development as TCs move from preservice preparation into the profession and can promote ongoing principles of active learning through connectivism and engagement with other professionals.

A primary recommendation for teacher educators, based on the technical miscues experienced by TCs, would be for more explicit guidance in the process of Twitter chat participation. For teacher educators, this could take the form of offering (and vetting) lists of appropriate chats organized by time and content area. More guidance would prevent TCs from finding and participating in chats like #educoach (a chat for veteran teacher literacy coaches), which are educationally related but not appropriate for TCs' developmental stage in the profession.

Teacher educators might also discuss the format of chats (facilitated, Q&A sessions, 1-hour in length once a week) and the importance of privacy settings (having a public Twitter

account at least for the duration of the chat) in order for full participation. Logistical guidance could be critical in mitigating some of the consistent difficulties TCs expressed in their reflections, even it this is challenging given the evolving nature of Twitter chats and the social media platform itself.

A second key recommendation for researchers and teacher educators is to explore the use of Twitter and Twitter chats more holistically and longitudinally to examine the ways in which TCs actually continue their participation in various Twitter-based PLNs following their preservice teacher education coursework. While Twitter chats have the potential to form a cohesive network, beginning in preservice teacher education courses and continuing into professional practice, it is beyond the scope of this study to determine whether the TCs in this study (or whether TCs more generally) continue these practices upon entering the field.

Given the vast number of time demands during teacher practicum and in early career teaching, it would be interesting and important to see if and how TCs continue to use and participate on Twitter and in Twitter chats as they continue in their professional journeys. Because much of Twitter participation can be passive (e.g., reading tweets without any indication on one's Twitter page of engaging with a particular hashtag or idea), this type of data would need to be collected through follow-up surveys, interviews, and discussion with initial participants during practicum and early teaching.

This initial study indicates that there may be promise for Twitter chats as a medium when used as a professional development tool for preservice teacher educators and for those interested in professional growth throughout teachers' careers. Given this potential, teacher educators and researchers should continue exploration of Twitter and other forms of social media as tools for professional networking and engagement to support the ongoing development of a future generation of teachers.

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