

Understanding Twitter AS A Networked Field Site

Implications for Research on Teacher Professional Learning

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INTRODUCTION

There are more than 360,000 teachers in Australian schools, all of whom are required to meet and maintain national standards for the profession through postqualification and in-service learning. However, a significant body of research has questioned the efficacy of traditional, top-down approaches to teacher professional development (Hammerness et al., 2005; Walshe & Hirsch, 1998; Wilson & Berne, 1999). Prior work suggests that effective professional development involves a content area focus, opportunities for hands-on and active learning, collective participation with colleagues, a substantial duration of contact hours, and consistency with teachers' knowledge and beliefs as well as educational reforms and policies (Cohen & Hill, 2001; Curwood 2014a, 2014b; Desimone, 2009; Garet, Porter, Desimone, Birman, & Yoon 2001; Little, 2012; Penuel, Fishman, Yamaguchi, & Gallagher 2007). Due to issues with time and cost, however, formal professional development available to teachers remains "woefully inadequate" (Borko, 2004).

Outside of school contexts, a growing number of teachers are engaging with new literacies, using social media tools, accessing online resources, and participating in local teacher-led groups in an effort to improve their teaching and support their students' learning (e.g., Carpenter & Krutka, 2015; Chapman & Ortlieb, 2015; Esterman, 2013; Lu & Curwood, 2015). As Cynthia Coburn (2001) stated, "Informal networks among teachers are largely unacknowledged by the policy

world. Yet they have enormous potential to play an influential role in teacher sense-making” (p. 163). Despite the potential of such networks, particularly in rural and remote areas, there is a lack of research in this area. We argue that professional learning extends beyond government-endorsed workshops and school-based initiatives to include self-directed and self-regulated activities, which are often invisible to accrediting organizations and school administrators. Informal networks are part of teachers’ wider social systems, and they offer teachers mentorship opportunities outside of their local schools. Not only does this give teachers access to new strategies, activities, and perspectives, it provides them with a way to engage in new literacy practices, explore new digital tools, and participate in personally meaningful professional learning.

In this study, we sought to gain insight into how Australian English teachers use Twitter as part of their professional learning and how this impacts their knowledge of content and pedagogy. As part of their daily lives, teachers traverse home, school, and community contexts, and they move across digital and physical environments—all of which have the potential to shape their beliefs, understanding, and practices. Consequently, research into teachers’ professional learning must value the complex ways in which they access information and engage in dialogue in order to support their professional development and improve student learning outcomes. For researchers, this line of inquiry poses methodological challenges as well as opportunities, particularly in terms of establishing the boundaries of the field sites, deciding upon data sources, and drawing upon analytical tools. In this chapter, we consider: In what ways are new literacy practices evident on Twitter? How can Twitter be understood as a networked field site? What approaches to data collection and data analysis can capture how teachers use Twitter as part of their informal, self-sponsored professional learning?

CONCEPTUALIZING PROFESSIONAL LEARNING: NEW LITERACIES, NEW PRACTICES

Teachers’ professional learning is situated in specific contexts, social in nature, and distributed across people, tools, and resources (Putnam & Borko, 2000). Prior studies demonstrate that there is often a disconnect between sociocultural theory, which conceptualizes learning as social and contextual, and the professional development offered in schools, much of which implicitly follows a transmissionist model (Cochran-Smith & Zeichner, 2005; Webster-Wright, 2009). These studies emphasize the importance of rethinking the way professional development is approached, so that it is more relevant and tailored to the needs of individual teachers and local schools (Borko, 2004). Even in professional learning communities, a model of school-based professional development that seeks to move away

from a top-down, prescribed approach, the end result can be restrictive for teachers (DuFour, 2004).

Professional learning supports teachers in adapting their pedagogy in response to the rapidly changing social, cultural, and economic environments in which they live and work. For this reason, it is essential that teachers update their skills and innovate their practices in order to meet students' complex and evolving learning needs (Avalos, 2011; Curwood, 2011; Desimone, Smith, & Phillips, 2013). Despite significant financial investments at local, national, and international levels, a substantial body of research challenges the effectiveness of traditional approaches to teacher *professional development*, which understands learning as a progression through stages and a series of learning opportunities that are frequently designed and administered by an outside expert (Little, 2002; Walshe & Hirsch, 1998). It instead emphasizes the importance of *professional learning*, which involves an active, collaborative, iterative, and ongoing process based on a teacher's personal interests, professional goals, and sociocultural contexts (Darling-Hammond & Sykes, 1999; Desimone, 2009). As Hilda Borko (2004) argued, "To understand teacher learning, we must study it within these multiple contexts, taking into account both the individual teacher-learners and the social systems in which they are participants" (p. 4).

Compared to passive forms of learning, such as attending a lecture, active learning is linked to more positive outcomes for teachers (Desimone et al., 2002). Active professional learning allows teachers to develop their knowledge of specific subject content, to engage in dialogue with other educators, to share resources and ideas, and to try out new strategies and materials in the classroom (Curwood, 2013). With the growing accessibility of social media tools and online spaces, and the recent popularity of informal, community-based meetings, teachers around the world are engaging in professional learning in new ways. These approaches are rapidly gaining momentum at a grassroots level, but have not yet been subjected to systematic study. To date, large-scale studies of professional learning have only touched on this area, such as Darleen Opfer and David Pedder's (2011) survey in the United Kingdom, which included one broad item: "I use the web as one source of useful ideas for improving my practice" (p. 10). Recent studies in Australia, the United States, and other countries have offered case studies of teachers within specific online contexts, including Facebook (Lu & Curwood, 2015), Twitter (Biddolph & Curwood, 2016; Britt, 2015; Carpenter, 2015; Carpenter & Krutka, 2015; Visser, Evering, & Barrett, 2014), Instagram (Billen, 2015) and Pinterest (Chapman & Ortlieb, 2015), as well as within community-based meetings, such as TeachMeets (Esterman, 2013).

Research on new literacies can help frame investigation into how teachers are engaging in professional learning in online spaces. Julie Coiro, Michele Knobel, Colin Lankshear, and Don Leu (2008) argue that: (1) new technologies create new

spaces for literacy and learning; (2) new literacies are vital to full participation in a global community; (3) new literacies are deictic and rapidly evolve as new tools and spaces emerge; (4) new literacies are multiple, multimodal, and multifaceted. Consequently, teachers' engagement in professional learning in online spaces can be understood through a new literacies framework. Today, digital technologies are rapidly changing and expanding; for example, while a social media tool like Facebook might seem like part of the fabric of our daily lives, it was only launched in 2004. Within a dozen years, it grew to 1.59 billion users and counting. Social media tools like Facebook and Twitter can serve as potential professional learning contexts for teachers as well as field sites for researchers. As we see it, in order to access and participate within online, informal networks to advance their professional learning, teachers must engage in new literacy practices. Not only do new literacies involve exploring new technologies and utilizing multiple modes of representation, they enable teachers to readily connect to a global community of educators.

New literacies reflect a sociocultural and situated approach to professional learning. At its core, professional learning is rooted in specific social and cultural contexts. While teachers previously may have been restricted to learning in and through physical contexts, the accessibility of Internet-connected devices means that online contexts are now readily available to them. From Instagram to Read-WriteThink.org, these new spaces give both "new potentials to literacy tasks" (Coiro et al., 2008, p. 14) and new potentials for professional learning. In order to access these spaces, teachers need to be able to understand, interpret, and communicate across a variety of modes and semiotic resources. At the same time, they must embrace (or at least tolerate) the fact that online spaces will evolve due to a variety of reasons, from technological advances to community demands. By drawing on a sociocultural, situated perspective of teacher learning that values dialogue in an online context, our study aimed to offer an innovative theoretical perspective and methodological approach (see also Biddolph & Curwood, 2016).

PUSHING THE BOUNDARIES: TWITTER AS A NETWORKED FIELD SITE

Prior research on Twitter and professional learning has demonstrated that it encourages preservice and in-service teachers to share resources and connect with other educators in a way that is both time- and cost-effective. Jeffrey Carpenter and Daniel Krutka's (2015) survey found that teachers appreciated the personalization and differentiation offered by Twitter-driven professional learning. Their survey collected quantitative and qualitative data, and their subsequent analysis of 494 responses provided insight into how classroom teachers, school administrators,

and university professors used and perceived Twitter. In Carpenter's (2015) study of Twitter within his own teacher education program, he found that it helped pre-service teachers to feel empowered and to see themselves as valued members of the teaching profession. He argued, "Twitter's concise, open, and ubiquitous nature potentially provides opportunities to increase teacher-student and student-student interactions, both inside and outside of the physical classroom" (p. 210). In addition to surveys and Twitter content, Carpenter (2015) also generated field notes and analytic memos. The approach to data collection within these studies highlights how Twitter can be used as part of informal professional learning as well as formal professional development. Moreover, they also show that researchers' methodological choices can position Twitter as one of multiple field sites within a study.

Traditionally, researchers have focused on a specific physical site in an effort to understand people's values, beliefs, cultural expectations, and social practices. With the growing availability and accessibility of digital technologies, however, today's online spaces challenge this narrow conceptualization of field sites. In many ways, researchers are no longer geographically or temporally restricted in terms of their access to potential participants and data sources (Lammers, Curwood, & Magnifico, 2012). Research, in this sense, is increasingly digitally mediated, and literacy researchers must consider how digital tools and online contexts shape their research questions, the design and implementation of their study, and their process of data analysis.

A field site can be understood as a "network composed of fixed and moving points including spaces, people, and objects" (Burrell, 2009, p. 189). In this light, field sites do not necessarily have established borders, which can present theoretical and methodological challenges to researchers at each step in the research process. Instead of defining a field site by physical contexts and boundaries, the concept of a network offers a way to understand the complex interactions between and among individuals, tools, and contexts across time and space. By their nature, networks are often multifaceted and malleable, subject to internal and external forces, and able to adapt and evolve. In addition, as danah boyd (2008) noted, "Networked technologies have completely disrupted any simple construction of a field site" (p. 27). In terms of new literacies, Julia Davies (2012) proposed that new technologies can facilitate new social literacy practices, which in turn allows people to perform new social acts that were not previously possible. Before the advent of digital tools and online spaces, teacher professional development was primarily studied within physical field sites driven by paper-based materials and face-to-face interactions. Today, Twitter and other social media offer researchers diverse and *dispersed* field sites.

Networked field sites are dynamic spaces that are user-driven, social, and collaborative (Gerber, Abrams, Curwood, & Magnifico, 2017) and promote "meaningful

human interactions” (Markham, 2003, p. 8). For researchers interested in teachers’ professional learning within informal, online networks, this means that they may need to leverage available technologies, access online traces of activity and participation, and engage with participants both near and far throughout their study. As a result, researchers need to be able to successfully navigate networked field sites at the same time that they reflect on what the various links, pathways, and intersections mean for individuals and communities (Hine, 2008). We argue that Twitter, as a networked field site, is a sociocultural context that involves new literacies, promotes meaningful interactions, and encourages self-directed, readily accessible, and personally relevant professional learning opportunities for teachers.

As a networked field site, Twitter encourages teachers to share resources and links from other online spaces, allows them to distribute their tweets across multiple social media platforms, and supports their engagement in ongoing discussion, such as through weekly chats on specific hashtags. To study Twitter as a networked field site, multimethod research (Creswell, 2015; Gerber et al., 2017) can examine professional learning in terms of both individual teacher-learners and wider social systems (Borko, 2004). In terms of methodologies, researchers can ask teachers (through surveys, interviews, and focus groups) how, where, and why they engage in professional learning in informal networks; they can also look at the networks themselves (through the online content) to understand the types of contributions and interactions that shape these professional learning experiences. In our study, we decided to conduct surveys and interviews to obtain teachers’ self-reports of professional learning on Twitter, as well as to examine Twitter content, in order to access teachers’ interactions within the network.

METHODOLOGY

Twitter as a Research Context

As a form of social media, microblogs allow individuals to generate their own online content, add hyperlinks and tags, and reach a global audience. Founded in 2006, Twitter allows users to read and write 140-character messages, called tweets, to communicate synchronously and asynchronously. Within a decade, Twitter has grown to over 310 million users worldwide. Tweets can contain text, images, and links to external pages, articles, and websites (Greenhow & Gleason, 2012). Through the use of hashtags, tweets can be part of larger conversations on Twitter, and tweets can be linked to or shared on other social networking sites and through e-mail. In 2015, at the time of our study, the standard website interface of Twitter included a navigation bar running across the top of the window that displayed icons for Home, Notifications, Messages, and Discover as well as

a search box. This latter function can be used to search for keywords, usernames, and hashtags.

The top left-hand corner of the screen displays the profile information of the user, including their name, profile picture, number of tweets, number of followers, and amount of people they are following. Hashtags are created by including the # symbol before a word or phrase. They are searchable within Twitter, and, as such, can be used to broaden the scope of a tweet by reaching a larger audience that extends beyond one's "followers" and can serve to highlight a particular topic, and also turn a topic into a "trend" (a topic that is popular at a particular time). Some popular education-themed hashtags include #engchat, #edchat, #pstchat, and #ozedchat. Our study focused on #ozengchat, which was created in 2012 for Australian English teachers to discuss and share ideas and resources related to the subject area. The chat is moderated by several members of the community, who tweet questions about previously agreed-upon topics, which assists in maintaining #ozengchat as a space for professional learning that is relevant to English teaching. While the hashtag can be used and accessed publically at any time, a live chat occurs fortnightly on Tuesday evenings.

Research suggests people regularly use Twitter to develop and maintain relationships through conversation (Marwick & boyd, 2011). The use of hashtags can bring individuals together around a shared interest or topic; for instance, Australian educators may use #aussieED to engage in ongoing conversation around education in general. Tweets appear as a constantly updating list down the center of the interface, and can be replied to, favorited, or retweeted (Cho, Ro, & Littenberg-Tobias, 2013). In this sense, "a tweet stream is a constantly evolving, co-constructed conversation" (Greenhow & Gleason, 2012, p. 472). A favorite is used to like or praise another user's tweet, and can also save the tweet to the user's account for access at a later time. Individuals can also retweet, which involves reposting another user's tweet to show agreement with or provide validation (Khan, 2012) as well as distribute information and encourage participation in public discourse (boyd, Golder, & Lotan, 2010). All of these actions, and opportunities for interaction, allow individuals to build and maintain relationships through Twitter.

It is important to acknowledge that the Twitter interface has updated substantially since our data were collected in 2015. This speaks to the fact that digital tools and networked spaces are in a perpetual state of flux, which can present challenges to researchers studying these spaces. For instance, researchers face the problem of maintaining relevance when their field site is constantly shifting and updating, both aesthetically and functionally. Perhaps more significantly, when a networked field site is updated, it may impact the way participants use and interact within the space as well as how data are stored and archived. We suggest that this may have implications for how data are accessed and interpreted, and ultimately, for how the findings of the study are created and disseminated. Researchers' data collection

tools may need to adapt to changing interfaces, and their research questions may need to evolve concomitantly with the field site.

Designing Our Study

Each study must have a *logic of inquiry* (Gee & Green, 1998) that links the research questions, theory, methodology, and findings. Research questions aren't necessarily set in stone, however. John Creswell (2013) posited, for example: "Qualitative research questions are open-ended, evolving, and nondirectional" (p. 138). Our study was driven by the following questions: How and why are English teachers using Twitter for professional learning? In what ways does participating in professional learning through Twitter influence teachers' professional practices? In framing our questions this way, we strove to keep them open and allow for multiple possibilities to emerge.

Building on prior research into teacher professional learning, we took a socio-cultural and situated theoretical perspective. Because we wanted to know both *how* and *why* teachers were using Twitter, we decided to collect multiple forms of data. While surveys and interviews would allow teachers to tell us, in their own words, about their experiences with using Twitter, a content analysis of their actual tweets would offer a more nuanced perspective. In addition, multiple sources of data provide for triangulation and increase the trustworthiness of the research findings. Trustworthiness is also tied to the explicitness of a study's data collection and analysis process. As Mark Constat (1992) noted almost 25 years ago and still relevant today: "Since we are committed to opening the private lives of participants to the public, it is ironic that our methods of data collection and analysis often remain private and unavailable for public inspection" (p. 254). In what follows, then, we share our approach to data collection and analysis in this study for inspection, in order to move the field's understanding of methodologies forward and to support research into new literacies and professional learning.

Participants

Participant recruitment for this study involved posting links to educational-related hashtags #engchat and #ozengchat, as well as to the Facebook pages of the English Teachers Association of New South Wales, National Council of Teachers of English, and Australian Association for the Teaching of English. Guided by the study's research questions, these venues or channels were chosen in a deliberate manner (Gerber et al., 2017). Interestingly, and despite the global reach of Twitter and Facebook, the 64 survey respondents were primarily from an Australian context (see Table 5.1). This was possibly due to the differences in time between countries and when we posted our calls for participants, which was an issue concerning

Table 5.1. Survey Demographics.

		Number of participants
Country	Australia	49
	USA	12
	New Zealand	1
	Singapore	1
	Ireland	1
Age	20–24	5
	25–30	8
	31–35	5
	36–40	14
	41–45	10
	46–50	7
	51–55	8
	56–60	6
Years Teaching Experience	61–65	1
	Preservice	3
	1–5	8
	6–10	15
	11–15	16
	16–20	7
	21–25	7
	26–30	2
31–35	6	

researching in online spaces that we initially failed to consider. The recruitment tweets were posted during the evening, when the Australian-based chats are most active, while the global-based #edchat had less traffic at this time. This prompted us to narrow the focus of our study to provide an Australian perspective, and all interviews were conducted with Australian educators who had participated in the #ozengchat discussion. Future studies could actively seek more global representation and higher survey participation, driven by their research questions, aims, and scope.

At the end of the survey, respondents were given the opportunity to express their interest in participating in an interview. These self-nominated participants were all users of #ozengchat, the Australian English teacher hashtag, and they were varied in terms of their years of teaching experience and their activity on Twitter. For this reason, they were selected as representative of the teachers that participate

in #ozengchat. Our use of purposeful sampling was based on “the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned” (Merriam, 2009, p. 77). All interview participants taught in secondary schools, with the exception of Leah, who worked as a university lecturer. All were Australian and based in New South Wales, with the exception of Hannah, who taught in South Australia, and Leah, who taught in Queensland (see Table 5.2).

Table 5.2. Interview Participants.

Name*	Role	Age	Years of teaching experience	Years using Twitter	Number of tweets posted	Number of followers	Number following
Jackson	English teacher	25–30	4	6	37K	1,495	1,259
Whitney	English and ESL teacher	36–40	16	3	21K	1,885	1,461
Kat	English teacher and Head of Professional Learning	31–35	10	6	49.9K	4,428	1,316
Hannah	Head of Library, and an English teacher prior to this study	36–40	13	3	8,585	413	213
Elise	Head of English	36–40	11	3	2,726	1,036	1,722
Jill	Head of English	51–55	30	5	12.8K	1,627	1,132
Ryan	Head of English	31–35	10	6	570	104	444
Leah	University lecturer of English curriculum, and an English teacher prior to this study	31–35	10	6	10.7K	3,044	2,633

* All names are pseudonyms

Data Collection

To answer our research questions concerning English teachers and their use of Twitter for professional learning, we collected multiple sources of data, including: (1) an online survey (see Figure 5.1) of 64 teachers about their professional learning and Twitter use, which included Likert scale and open-ended questions; (2) hour-long semi-structured interviews (see Figure 5.2) with eight focal participants, and

Survey items

1. **What is your current country of residence?**
2. **Please indicate your age.**
 - Under 20
 - 20–24
 - 25–30
 - 31–35
 - 36–40
 - 41–45
 - 46–50
 - 51–55
 - 56–60
 - 61–65
 - 66–70
 - over 70
3. **What is your full time equivalent teaching experience?**
 - Preservice teacher
 - 1–5 years
 - 6–10 years
 - 11–15 years
 - 16–20 years
 - 21–25 year
 - 26–30 years
 - 31–35 years
 - more than 35 years
4. **How long have you been using Twitter for professional development purposes?**
 - Less than a year
 - 1 year
 - 2 years
 - 3 years
 - 4 years
 - 5 years
 - 6 years
 - 7 years
 - 8 years or more
5. **How often do you READ tweets related to your professional practice?**
 - Daily
 - Several times a week
 - Once a week
 - Several times a month
 - Rarely
6. **How often do you RETWEET related to your professional practice?**
 - Daily
 - Several times a week

(Continued)

(Continued)

- Once a week
- Several times a month
- Rarely
- 7. How often do you POST original tweets related to your professional practice?
 - Daily
 - Several times a week
 - Once a week
 - Several times a month
 - Rarely
- 8. How often do you use Twitter completely UNRELATED to your professional practice?
 - Daily
 - Several times a week
 - Once a week
 - Several times a month
 - Rarely
- 9. What educational hashtags do you use on Twitter?
 - #edchat
 - #aussieED
 - #engchat
 - #ozengchat
 - #pstchat
 - #edtech
 - other (please specify)
- 8. Describe the types of professional training and development you have engaged with throughout your career (e.g., school in-services, graduate classes, conferences, online seminars). Please indicate if they were compulsory or voluntary.

- 9. Describe at least one professional development experience that you found highly valuable. Explain why.
- 10. Read the following statements and indicate the degree to which you agree or disagree using the scale from 1 to 5, with 1 being strongly disagree, 2 is disagree, 3 is neutral, 4 is agree, and 5 is strongly agree.
 - The professional development opportunities offered by my school are relevant to my classroom practice.
 - Professional development offered by my school is tailored to my individual needs.
 - Professional development offered by my school is tailored to my individual interests.
 - Participating in live and synchronous Twitter chats is a meaningful form of professional development.

Participating in asynchronous Twitter chats is a meaningful form of professional development.

My level of participation in Twitter chats depends on my interest in the topic.

My participation in Twitter chats fluctuates.

If I need help or advice then I am active in Twitter chats, otherwise I do not participate.

My participation in Twitter chats is not limited to my own needs; I try to participate in most discussions.

Reading Twitter chats related to teaching has influenced my classroom practice.

Reading Twitter chats related to teaching has significantly changed my classroom practice.

Contributing to Twitter chats has influenced my classroom practice.

Contributing to Twitter chats has significantly changed my classroom practice.

11. Please indicate if you are willing to participate in a 30- to 60-minute interview about your use of Twitter for professional development.

No, I do not wish to participate in an interview.

Yes, I am happy to be interviewed.

If “yes,” please provide your name and contact details in the box (Your personal details will remain confidential, they will only be used to get in touch with you. Please see Participant Information Statement for more information):

Name:

Contact number:

Email:

Twitter handle:

Fig. 5.1. Survey questions.

conducted via Skype; and (3) 530 tweets that included the #ozengchat hashtag. These tweets were taken from four separate #ozengchat weekly chats, and were selected as representative of the hashtag based on recommendations by the creator of #ozengchat, who we interviewed as part of the study, and who assisted us in accessing the #ozengchat archives. We collected tweets that used this hashtag because of its Australian focus, and because all of the participants had previously contributed to this hashtag. Our decision to collect these data sources was in direct response to our research questions. For example, the tweets themselves offered insight into how teachers use Twitter as part of their professional learning, but the interviews and surveys gave us a robust understanding of why. Similarly, we included specific questions in the interviews to uncover how Twitter participation shaped teachers’ knowledge of content and pedagogy.

According to Catherine Marshall and Gretchen Rossman (2006), “In deciding to survey a group of people, researchers make one critical assumption—that

Interview questions

- Where do you teach? What subjects do you teach? How long have you been teaching?
- Describe your experiences of professional development. What activities does it typically involve? Is the experience mostly positive or negative? Do you think it is important?
- Why did you start using Twitter? Was it initially for professional purposes?
- What Twitter chats do you regularly participate in? Participation includes reading other users' tweets, and contributing your own.
- How did you hear about the Twitter chats you participate in?
- What are the most important characteristics of Twitter chats for you? What do you get out of participation? (For example, sense of belonging, emotional support, resources, advice, guidance, inspiration, and networking).
- What are the advantages of Twitter chats over other forms of professional development?
- What are the disadvantages of Twitter chats in comparison to other forms of professional development?
- Please provide one or two examples of something you learnt in the last Twitter chat you participated in. (For example, content, pedagogy, or skill).
- How are weekly topics for discussion decided? Are there any topics that are off-limits? Do you think the public nature of Twitter influences the types of content and information you share? In what ways?
- Are there any restrictions or rules when participating in Twitter chats (types of information or content posted)? How are these rules conveyed? Is it implicit or explicit? How are breaches in these rules addressed?
- Have you been able to convince other people you work with to participate in Twitter chats? If yes, how many? If no, what do you think is causing the resistance?
- Do you communicate with participants outside of the chat session hours? If yes, how do you communicate, and why? What limitation of Twitter are you addressing? (For example, Twitter, face-to-face, phone conversations, e-mails, etc.).
- What were your initial goals of participating in Twitter chats?
- Describe the first time you participated in a Twitter chat. Was it a positive, challenging, overwhelming, or exciting experience?
- What motivates you to regularly participate in Twitter chats?
- What are the biggest challenges of participating in Twitter chats? How do you overcome these?
- How has your experience of engaging in Twitter chats developed or changed over time?
- How could the quality of discussion in Twitter chats be improved?
- How has Twitter influenced your practice as an English teacher?
- What direction would you like to see professional development move toward in the future? Explain your answer.

Fig. 5.2. Interview questions.

a characteristic or belief can be described or measured accurately through self-reporting. In using questionnaires, researchers rely totally on the honesty and accuracy of participants' responses" (p. 125). As researchers, we recognized that both our survey and our interviews involved teachers' self-reporting of their

professional learning that involved Twitter. In order to offer a more nuanced perspective, we also looked at their tweets as part of a specific hashtag. Consequently, this allowed us to ask participants about their new literacy practices that shaped their professional learning as well as to examine the specific digital tools that supported this process. One of our research questions specifically asked how Twitter participation shaped teachers' professional practices; additional data sources could have included classroom observations, lesson plans, and even student work. However, we decided that this was beyond the scope of the present study, but that it would offer opportunities for future research. We continue the discussion of our methodological decisions in the following sections.

Data Analysis

For the surveys, we interpreted multiple choice and Likert scale data quantitatively, and we identified frequently used terms in the open-ended question responses. The interviews and tweets were interpreted through a process of thematic analysis. This involved closely reading the data line by line and separating it into salient fragments or themes, which were then used to infer meaning (Saldaña, 2012). This is an inherently subjective process, as meaning is shaped by the interpretations of the researcher, the theoretical framing of a study, and the social and cultural context in which the analysis of data takes place (Mason, 2002). The data from interviews and tweets were analyzed concurrently using first cycle and second cycle coding methods (Miles, Huberman, & Saldaña, 2014). During the first cycle, meaningful fragments in the data were labeled using *in vivo* coding, which uses terms and phrases from the participants' own language as codes, thereby allowing us to consider the data from their perspective. "On your own" is an example of an *in vivo* code we used to label data that described a reported lack of support for formal professional learning and instances of self-initiated or independent learning. The tweets were analyzed using process codes, which imply observable action, to help capture the ways in which Twitter is used by educators (Saldaña, 2012). Only one code was applied to each tweet, and sample codes are described in Table 5.3.

During the second cycle of coding interviews and tweets, we identified patterns across both data sources and reduced the number of codes by removing those that occurred less frequently, as well as those that shared the same meaning with another code. During this stage we also changed the *in vivo* codes that used the participants' own language, to descriptive codes that summarized a primary theme. For example, the *in vivo* code "on your own" became the descriptive code "self-directed learning." This clarified the meanings of the codes (see also Table 5.3), which were then cross-referenced with the quantitative data from the survey to highlight salient themes and assist with triangulation (Denzin & Lincoln, 2000).

Table 5.3. Tweet codes.

Code	Description	No. of times code occurred
SHARING RESOURCES	<p>Links to external resources such as websites and articles that inform teaching practice, or can be used in the classroom.</p> <p>Example: “OK, straight off the bat is the top two Shakespeare links I give to my students: nfs. sparknotes.com & shmoop.com/shakespeare/#ozengchat”</p>	122
REFLECTING ON EXPERIENCES	<p>Reflecting on personal experiences they have had as a teacher. This can include sharing successes and failures, and reflecting on their teaching philosophy.</p> <p>Example: “Hurley is interesting for me personally. I feel it’s a bit dry for students. Lots of interesting idea of disc. though #ozengchat”</p>	77
DESCRIBING PRACTICE	<p>Tweets that describe strategies that have been implemented in the classroom.</p> <p>Example: “#ozengchat I did a Macbeth/GoT lesson re: regicide + kingslayer, doubletrust + red wedding, and Lady Macbeth + Cersei ...”</p>	75
ASKING A QUESTION	<p>These were in the form of open questions that were directed toward everyone, as well as direct questions that were specifically targeted toward individual users.</p> <p>Example: “#ozengchat I need some help Language, Learning and Literacy Does anyone have any information that’s not on the intranet?”</p>	71
OFFERING IDEAS	<p>Suggestions and inspiration for classroom practice.</p> <p>Example: “Engaging with poetry—get students to illustrate a selected poem #ozengchat”</p>	70
RESPONDING TO QUESTION	<p>Directly responding to or answering a question posed by another user.</p> <p>Example: “we do insults as well! And idioms that we use today from Shakespeare #ozengchat #greatminds”</p>	51
NETWORKING	<p>Networking includes making plans to collaborate with other users, and personal conversations unrelated to professional practice.</p> <p>Example: “We should do some collaborative projects w my ESL classes then! :) #sokeen #ozengchat #authenticlearning”</p>	47

TRACING THE ANALYTICAL PROCESS: DECISIONS, EXAMPLES, AND CONCLUSIONS

Developing Codes for Online Thematic Analysis

In our analysis of the content of 530 tweets from the #ozengchat hashtag, we drew from four separate and representative #ozengchat weekly archived chats involving English teachers from across Australia. While our interviews and surveys offered insight into *why* teachers used Twitter as part of their professional learning, our content analysis showed *how* teachers drew on new literacies and actively engaged with this particular networked field site. As noted earlier, we decided to use process codes as part of our thematic analysis. Because process codes focus on observable action, and our aim was to clearly and succinctly describe the purpose of each tweet, this approach was in line with both our research questions and our theoretical framework. Our analysis revealed that teachers most commonly contributed to the #ozengchat hashtag by sharing resources, reflecting on their experiences, and describing their classroom practice. Notably, this resonated with survey data that indicated that responding teachers use Twitter predominantly for professional purposes.

In creating the process codes to apply to the Twitter chats, we asked ourselves: What is the primary purpose of this Tweet? In considering this question, we looked at the structure of the tweet itself: Was it a question, a statement, or a reflection? Who was the targeted audience, and did it extend beyond the #ozengchat discussion, as evidenced by the use of other hashtags or mentions? Did it contain hyperlinks, or include photos, videos, or other potential resources? Was the tweet in direct response to the topic of the weekly discussion, or was it a reply to another person's tweet? In order to capture both the spirit of process codes, and the nature of the tweets, our codes began with gerunds, or verb forms that function as nouns. Through a process of creating, refining, and defining our process codes, the final codes included: (1) sharing resources; (2) reflecting on experiences; (3) describing practice; (4) asking a question; (5) offering ideas; (6) responding to a question; and (7) networking (see Table 5.3).

In analyzing the 530 tweets, we applied one code to each, in order to gain a deeper understanding of how Australian English teachers used Twitter as part of their professional learning. We found it instrumental to develop a working definition of each code, which we refined over time, and to include several example tweets, which we repeatedly referred back to throughout the coding process. While the *sharing resources* code appeared most frequently, 57 of 122 of these instances occurred outside of the designated time of #ozengchat. In terms of new literacies, this suggests that asynchronous participation in Twitter chats may be

more about sharing ideas and resources while synchronous participation may focus more on seeking advice and reflecting on experiences. Our analysis of the tweets was complemented by a simple quantitative analysis, which revealed 228 favorites, 143 retweets, and 12 instances of direct praise. Similar to our interview and survey data, these outcomes reinforced our interpretation that teachers' Twitter use entailed contributing to and engaging in a supportive professional learning network.

Interpreting Emergent Findings, Drawing on Theoretical Perspectives

In conceptualizing Twitter as a networked field site, our analysis of #ozengchat showed how it encouraged teachers to share resources and hyperlinks, and how it offered them an opportunity to engage in both synchronous and asynchronous discussion to advance their professional learning. Our theoretical understanding of professional learning was instrumental in shaping both our data collection and data analysis. Because we take a sociocultural and situated approach in our research, we believe that professional learning can only be understood within specific social and cultural contexts. By electing to draw on Twitter content as a data source, we were able to directly examine interactions within the context of an online, informal professional learning network. While this offered us insight into how teachers use Twitter, we knew that we needed to directly ask teachers why they used this tool as part of their self-sponsored professional learning.

In designing our survey and interview questions, we asked participants to share details about their practices, habits, beliefs, and challenges. Notably, this also allowed us to understand Twitter as a networked field site. For instance, our survey asked respondents about other education-related hashtags that they used as well as about available professional development at their school. Because we recognized that professional learning takes place across multiple sociocultural contexts, this approach to data collection offered us a more nuanced perspective on how teachers engage in professional learning. We felt that it was important for our data collection instruments to include open-ended questions, and consequently allow for multiple accounts of experiences and different perspectives to emerge.

As researchers, we know that *inquiry* and *possibility* are vital components of any study. In our Twitter research, we were surprised by the degree to which teachers wanted to have their learning and their knowledge both recognized and valued by their peers. As one teacher reflected, "Twitter was about establishing myself within a community of educators who value me." While we did not specifically ask them about the ways in which their professional learning was officially (by schools or accrediting organizations) or unofficially (by peers or other educators) acknowledged, this emerged in a number of interviews. By drawing on our theoretical framework, we were able to understand that teachers wanted professional

learning that occurred within one context to be valued and validated by other contexts. As one teacher pointed out about his colleagues, “They have got no idea [what Twitter can offer].”

MOVING FORWARD

To understand the professional learning of teachers, we must study it within and across the multiple personal and professional contexts in which learning occurs (Borko 2004), and our study sought to address a critical gap in the research. To that end, we drew on multiple forms of data, including a survey, interviews, and tweets, to investigate how and why these particular English teachers used new literacies to participate in Twitter and, in turn, to gain insight into how this shapes their professional learning. This chapter addressed questions about how researchers can approach the study of learning within these multiple contexts, when digital tools and networked spaces have redefined the very notion of field sites. While traditionally research was confined to physical field sites with established boundaries, the permeation of social media and digital technologies into our day-to-day lives has opened up new spaces and opportunities for inquiry. This has prompted researchers to reconceptualize field sites as evolving, networked, and dynamic (Burrell, 2009; Gerber et al., 2017).

Paramount to our study was the understanding of Twitter as a networked field site; a constantly evolving, participatory, and multifaceted space where teachers share ideas and resources and participate in a professional dialogue. In conducting our study within this unique digital context, we faced a variety of theoretical and methodological challenges that shaped the design and implementation of the study as well as the process of data analysis. Our research questions allowed for unexpected findings and multiple perspectives, by asking *how* and *why*, and the multidimensional interactions between and among individual participants within the space were explored through the collection of multiple data sources. Each data source allowed us to consider a different dimension of the research questions, creating a more nuanced understanding of individuals and their interactions within this particular networked field site. The survey provided a broad understanding of *why* teachers use Twitter for professional learning, the interviews conveyed the diverse experiences of individual teachers within a particular online learning community, and the analysis of tweets from #ozengchat archives showcased *how* teachers used Twitter.

Future research on Twitter and teacher professional learning can draw from established approaches to big data. For example, public Twitter data, such as through popular hashtags like #ozedchat or #ozengchat, is easily accessible through Twitter’s Application Programming Interface (API). Data collection for

Twitter will include: (1) content (e.g., keywords, language) as well as associated metadata, such as (2) sender (e.g., Twitter username and numerical ID); (3) recipients (e.g., @mentioned usernames in the tweet); (4) timestamp; (5) tweet type (e.g., retweet, reply, or original tweet); (6) hashtags; (7) URLs (Bruns & Steiglitz, 2014). A number of open source tools have been developed through the Digital Media Initiative, including Twitter Capture and Analysis Toolset (T-CAT), and these can be customized by individual researchers.

Social media network analysis examines both network and social structures to “specifically determine how individual influence operates within a complex, interwoven collection of networked individuals” (Hutchinson, 2015, p. 24). Using Gephi, an open-source visualization and exploration software package, Jonathon Hutchinson ran his Twitter through a combination of the Force Atlas 2 and Fruchterman Rheingold spatialization algorithms to indicate which users and topics are more relevant to users’ conversation by placing them in the center of the graph. The nodes can then be adjusted by their size according to the amount of outward edges or connections to other nodes. The resulting visualization, using metrics such as between-ness, centrality and connectivity, can represent how teachers within this specific informal online network are engaging with specific education topics.

Diverse methodological approaches can offer insight into how teachers use specific social media tools, such as Twitter, to share their practices, connect with others, and access available resources. By detailing the considerations and challenges within our study, we have provided insight into how research can be conducted within digitally mediated spaces and networked field sites. To move the field of literacy research forward, we argue that researchers need to make their methodological choices, data collection tools, and analytical processes transparent. Not only will this promote the trustworthiness of the findings, it will encourage rich dialogue around the process, product, and impact of new literacies research.

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