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Perceptions of Administrators' Support for Grades K-5 Teachers' Professional Learning with Twitter: What Does It Look Like?

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This mixed-methods study investigated support for Grades K-5 teachers' learning with Twitter. As more teachers turn to the Twitter microblogging service as an online space for professional development (PD), it is important to understand how and if teachers believe school administrators' support their use of Twitter for teacher PD. Key findings from this study revealed that two thirds of participants considered their administrators to be supportive of Twitter for their PD. Support was perceived when administrators, including superintendents and principals, were (a) active Twitter users and (b) encouraged teachers to share what they had learned on Twitter. However, some participants expressed feeling discouraged by administrators who seemed mostly interested in maintaining the status quo in their schools. Support from administrators may help teachers critically evaluate information they learn from Twitter and ensure its alignment with evidence-based teaching practices, skills that are necessary in an era with an abundance of easily accessed information. In consideration of the COVID-19 pandemic, school leaders and policymakers may want to consider their support for teachers' use of Twitter as a legitimate resource for professional learning, especially for ideas related to remote teaching and online learning.

Purpose

Throughout their careers, teachers face many challenges in the classroom. Especially during the COVID-19 pandemic, teachers have had to adapt to new protocols for online teaching, hybrid teaching, and changes to in-person learning. With online teaching, new challenges have evolved, forcing teachers to find solutions to problems such as access to computers and the Internet, keeping students engaged, maintaining the integrity of assessments, managing teaching and homeschooling, and many more.

Likewise, teachers are still expected to prepare and teach their lessons and “deal with constant daily disruptions” (Fullan, 2007, p. 24), including behavioral and social issues. Further, when students fail to meet expected performance standards, public discourse views teachers as having failed America’s children (Carter & Lochte, 2016).

Teacher attrition data reveal that between 19% and 30% of new teachers leave the profession within the first 5 years of teaching, with the most important reason being due to dissatisfaction with the administration (Sutcher et al., 2016). Support from school administrators that focuses on “school culture and collegial relationships, time for collaboration, and decision-making input” (p. 52) leads to greater satisfaction and teacher retention. While the nature of the teaching profession tends to be “isolationist, insular, teacher-centered” (Hennessy, 2014, p. 217), teachers’ morale can be improved by allowing them to have more authority and ownership over school-based decisions.

As a result of the many demands placed on teachers and the nature of feeling alone in one’s classroom or while teaching remotely, many teachers have turned to the social media microblogging service, Twitter, for affirmation, PD, and support from other educators (Nochumson, 2018). Well before the forced transition to online teaching during the COVID-19 pandemic, Twitter had been a resource for teachers seeking information and support (Carpenter & Krutka, 2015; Forte et al., 2012).

During the pandemic, inquiries by teachers on Twitter have grown, especially with tweets related to the hashtags #RemoteTeaching and #RemoteLearning (Trust et al., 2020). Twitter offers educators a place to seek “knowledge and resources to help them address pedagogical challenges” (Trust et al., 2020, p. 157).

Twitter, which has been around since 2006, allows users to post brief “tweets” consisting of up to 280 characters. Tweets can include text, images, videos, and links to other sources. The use of hashtags (#) is a convenient way to label tweets based on subject matter and to search for topics of interest. Information is available immediately, satisfying teachers’ needs for real time assistance (Cuban, 2013).

With mass communication expanding in online spaces such as Twitter, it has become easier to spread information widely, including misinformation (Brummette et al., 2018; Merriam & Bierema, 2014). Misrepresenting oneself with social media has also become possible by purchasing

followers to inflate one's influence (Confessore et al., 2018) and, in the case of some teachers on Twitter, to promote digital tools in exchange for free classroom technology (Singer, 2017).

Regardless of online social media's shortcomings, many educators are navigating and finding information that is pertinent to their teaching practices (Britt & Paulus, 2016; Nochumson, 2020). While information is easily accessible from Twitter, it is important to ask how teachers decide what information to integrate into their teaching from their online learning experiences and whether they have any school-based support as they attempt to try new ideas and strategies that they have learned. According to Schrum et al. (2011), "Administrators need to know how technology can promote learning, be appropriately situated as both a topic of and a support to the curriculum, and support whole-school improvement" (p. 244).

Having administrators who recognize teachers' use of Twitter as a valuable resource is not only an opportunity to build collegiality, it opens a conversation about the authenticity of information obtained online and whether it adheres to educational standards for student learning. Moreover, according to Ketterlin-Geller et al. (2015), "Administrators can help teachers interpret and use research findings" (p. 52), which may be amongst the information teachers encounter in their use of Twitter.

To date, little empirical research is available indicating how, and if, school administrators support their teachers in this endeavor or whether support from administrators is beneficial for teachers who use Twitter for professional learning (Sauers & Richardson, 2015; Visser et al., 2014). However, a body of research does show the importance of instructional leadership from school principals and the successful implementation of PD (Schrum et al., 2011; Vavasseur & MacGregor, 2008).

In general, teachers feel supported when their administrators encourage them to "take risks, experiment with new ideas and practices, and exercise creativity" (Bredeson, 2000, p. 395). Administrators who interact with their teachers by providing resources, giving feedback, communicating effectively, and maintaining a visible presence are more likely to have a positive impact on student achievement (Smith & Andrews, 1989, as cited in Whitaker, 1997). Further, administrators should create a culture of collaboration (Ketterlin-Geller et al., 2015), which could include formalizing the use of social media. The purpose of this study was to uncover what types of support from administrators, if any, teachers have for their use of Twitter to learn and implement new ideas into their teaching practices.

Research on Teachers' Use of Twitter

Researchers have found that Twitter may offer certain benefits to teachers, including (a) emotional support and feedback (Davis, 2015; Visser et al., 2014), (b) personalized information for teachers to "choose what best applies to their own learning needs" (Davis, 2015, p. 1555), (c) trustworthiness between teachers who may be more likely to adopt ideas and strategies endorsed by one another (Masterman, 2013), (d) feeling

“less professionally isolated” (Visser et al., 2014, p. 408), and (e) the belief they are learning “the latest research, pedagogical strategies, and best practices” (Visser et al., p. 407). Despite these perceived benefits, some teachers reported disappointment that administrators do not view Twitter as a legitimate learning resource (Davis, 2015; Nochumson, 2018).

Administrators’ Use of Twitter

While many Twitter-using teachers may perceive their administrators as uninformed as to how online social media may benefit them, researchers have found that some administrators are using online social media for their own professional learning (Cho, 2016; Trust et al., 2018). Webb (2011) has argued that administrators should be “knowledgeable about technology... in order to provide guidance concerning technology use and integration” (p. 6). As Twitter increasingly gains acceptance as a space for teacher learning, it is important to understand what support or guidance, if any, teachers have for learning with Twitter.

Online Social Media as a Learning Tool

A key component for learning is the shared experience and ability to engage socially with others (Mayes & de Freitas, 2013). Social media networks can be defined as “a digital environment where people can gather, critique and share digital media items such as data, information, images and video recordings across established online networks” (Kaplan & Haenlein, 2010, as cited in McDonald & Danino, 2015, p. 61). Interactions that take place in social media spaces “may provide practitioners with on-demand resources and opportunities to engage in reflective thinking and be a part of an online community of practice that spans a global network of professionals” (Davis, 2015, p. 1557).

Drawbacks of Twitter for Teachers

Despite the perceived benefits, such as gaining a supportive network, learning about new ideas for teaching practices, and collaborating with others, potential drawbacks with using Twitter for professional learning have been noted. Forte et al. (2012) described teachers who obtained information and resources from Twitter as having the ability to change their educational practice. However, more empirical evidence is needed to determine the impact Twitter PD has on teaching practices (Visser et al., 2014).

Participants in social media networks may not necessarily engage with shared resources they encounter “at a deeper level” (Tour, 2017, p. 16) to substantiate the quality of the information. For instance, some teachers reported disillusionment with educators’ tweets containing information on educational practices that were no longer supported or those that lacked a connection to curricular objectives (Carpenter & Harvey, 2019). Additionally, the increased interaction with other educators may lead to teachers facing “challenges in judging their online interlocutors’ credibility and expertise” (p. 3).

Further, “teachers need to be able both to make good choices among curriculum options and to study and deeply understand the teaching implication of the choices they ... have made” (Darling-Hammond et al., 2005, p. 189). Navigating social media alone forces teachers to take responsibility for the accuracy of the information they are obtaining and for the implementation and evaluation of that information as it may be applied in their teaching.

Fox and Bird (2017) found that teachers struggle to reconcile using social media for personal and professional purposes and that they would benefit from support as to “how to operate safely” (p. 671). Likewise, since teachers are public figures, any of their public posts “could be taken out of context by parents” (Carpenter & Harvey, 2019, p. 2). Further, social media may have an “echo chamber” effect whereby teachers may not be exposed to alternative opinions and ideas (Carpenter & Harvey, 2019). Having school-based support from administrators may help teachers determine the credibility of Twitter users by suggesting qualified people to follow, in addition to helping teachers critically assess information (Ketterlin-Geller et al., 2015).

Prior research on Twitter use for learning has focused on many areas of education, such as higher education (Hull & Dodd, 2017; Kimmons et al., 2017; Mills, 2014), preservice teacher education (Colwell & Hutchison, 2018; Lemon, 2014), and school leaders’ use of Twitter (Cho, 2016; Sauers & Richardson, 2015). This study sought to fill a gap in the literature surrounding whether school-based support is provided to teachers as they increasingly go online to learn.

Methodology

This research addressed the following research question: What support do teachers have when they want to implement what they have learned from Twitter? This article reports on partial findings from a larger study of Twitter use by educators that was much broader and comprehensive (Nochumson, 2018). For the larger study, a two-phase mixed-methods approach was used to gain a greater understanding of how elementary schoolteachers described using Twitter for their professional learning. More specifically, the research study incorporated a within-stage mixed-model design (Johnson & Onwuegbuzie, 2004), in which an online survey was designed to collect both quantitative and qualitative data concurrently (see [Appendix A](#)). Hesse-Biber (2010) supported this methodology: “Qualitative research can draw on quantitative findings to explore in more detail issues and discrepancies” (p. 66).

The lens of adult learning theory (Merriam & Bierema, 2014) was used as a framework to explore formal and informal learning occurring within online social media. Formal learning environments typically include a defined set of outcomes that learners experience in structured classroom settings, workshops, seminars, and degree programs (Abramo & Austin, 2014; Knowles, 1950; Marsick, 2009).

While informal learning was increasing in online spaces as much as a decade ago (Tadros, 2011), learning outcomes may not be as defined, since

online learning does not culminate in a “summative evaluation” (Levenberg & Caspi, 2010, p. 325). Teachers who use Twitter to support their informal learning may be doing so without the guidance they typically would receive in more formal learning situations.

Research Design

A survey was created and pilot tested with a convenience sample of 24 Twitter-using teachers. Upon completion of the pilot study, participant feedback was obtained on clarity of questions and length of the survey. Reliability of the two Likert rating scales was investigated using Cronbach’s Alpha (McMillan, 2008) with both having alphas above 0.70, reflecting standards for scale reliability (Gaur & Gaur, 2009).

The survey consisted of 45 items, including two 5-point Likert rating scales, 19 conditional closed-ended questions, and 22 open-ended questions. Additionally, participants were able to provide explanations for their responses to the closed-ended questions, allowing for a more robust understanding of the data (Hesse-Biber & Johnson, 2015).

Table 1 Description of Research Design Phases

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Recruitment of Participants

In Phase I, participants answered survey questions that were distributed from my own Twitter account. A benefit to online surveys is the ability for participants to “select the time and place for participation” (Merriam, 1998, p. 8), which can be empowering for them. In order to reach as many elementary school teachers as possible, certain hashtags (#) that elementary teachers would be more likely to view and include in their own tweets, such as #elemchat, #3rdchat, #4thchat, and #kinderchat, were used in tweets seeking participation in the study.

Tweets were also scheduled to post at different times throughout the day and into the night for a period of 3 months to factor in the different time zones in the United States. While Twitter has a global audience, and this survey did receive international input, results were filtered to include only teachers in the United States to keep the findings consistent with the reviewed PD literature, most of which was situated in the United States.

A purposeful sample (Nochumson, 2018) of survey participants who supplied their email addresses at the end of the survey were contacted via Skype, Google Hangouts or mobile phone depending on their preferences. Audio recordings of the calls, which averaged 15 minutes, were transcribed and coded into the categories that showed either supportive or nonsupportive descriptions of interviewees’ administrators.

Data Collection

In addition to targeting specific hashtags, leaders in the field of education, many of whom have thousands of followers, received tweets asking them to share the link to the online survey with their followers. Teachers in Grades K-5 were targeted with tweets to specific hashtags. Phase I included 107 teachers of Grades K-5.

Phase II involved interviews with 19 out of 50 respondents who provided dates and times when I could follow up with them. All interview participants were given pseudonyms. Survey and interview participants completed the informed consent process and were aware that they could end their participation at any time. See Tables 2 and 3 for participant sample details.

Table 2 Survey Participant Sample

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Table 3 Interview Participant Profiles

Participant	Geographic Region of the United States	Years of Teaching Experience	Grade Level(s)	Subject Area Most Comfortable Teaching	School Type	Length of Time as Twitter User	Highest Degree Earned	% of Students Receiving Free/Reduced Lunch
1. Aaron	Midwest	1-2	5 th & 6 th	Social studies	Private	More than 2 years	Masters	11-20%
2. Allison	West	3-5	3 rd	Social studies	Public	More than 2 years	Masters	90-100%
3. Courtney	Midwest	3-5	1 st , 2 nd , 3 rd	Technology	Public	1-2 years	Bachelors	81-90%
4. Derrick	Northeast	3-5	4 th	Math	Public	More than 2 years	Masters	90-100%
5. Diana	West	16-20	2 nd	All	Public	More than 2 years	Bachelors	21-30%
6. Holly	Southeast	11-15	3 rd	Math	Public	6 months-1 year	Masters	51-60%
7. Jessica	Southeast	16-20	K-5	Reading	Public	More than 2 years	Masters	81-90%
8. Justine	Midwest	11-15	4 th & 5 th	Science	Public	More than 2 years	Masters	1-10%
9. Kambell	Southeast	3-5	K-5	Reading	Public	More than 2 years	Ed.S	41-50%
10. Libby	Midwest	3-5	5 th	Reading	Public	More than 2 years	Masters	31-40%
11. Margot	Midwest	3-5	2 nd	Reading	Public	More than 2 years	Bachelors	71-80%
12. Nina	Northeast	25+	4 th	Reading	Public	More than 2 years	Masters	11-20%
13. Pearl	South	25+	4 th	Writing	Public	More than 2 years	Masters	90-100%
14. Roxanna	Northeast	16-20	5 th	All	Public	More than 2 years	Masters	1-10%
15. Simone	Midwest	20+	1 st	Math	Public	6 months-1 year	Masters	21-30%
16. Samantha	Northeast	16-20	2 nd	Science	Public	More than 2 years	Bachelors	71-80%
17. Stacey	West	16-20	5 th	Technology	Public	More than 2 years	Bachelors	41-50%
18. Sylvie	West	11-15	1 st -5 th	Music	Public	More than 2 years	Bachelors	71-80%
19. Wendy	West	3-5	K-12	Technology	Public	6 months-1 year	Masters	0

Note. N = 19. Reprinted from *An investigation of elementary schoolteachers' use of Twitter for their professional learning*, by T. C. Nochumson, 2018, Academic Commons. Copyright 2018 by Talia Nochumson.

Data Analysis

While the research reported here is based on a larger study, the data analysis for this paper focused on information pertaining to administrators' support for teachers' learning with Twitter. First, qualitative data from the open-ended survey questions were quantified and assigned codes. Next, the frequencies of the codes were recorded. Then, statistical measures including chi-square and cross-tabs were applied to quantitative data. Last, interpretations of both quantitative and qualitative data were made.

A chi-square test was performed on all quantitative data "to determine whether the patterns of difference are different enough to be considered statistically significant" (Abbott, 2011, p. 454), while qualitative data was coded into categories (Creswell, 2014). The categories that emerged from the open-ended questions in the online survey and interviews included supportive administrators and non-supportive administrators. Results from the online survey were used to gain an understanding of the context in which teachers use Twitter, in general, and to guide the development of questions for the follow-up interviews ([Appendix B](#)).

Findings

The purpose of this research study was to learn whether teachers had support from administrators for their online learning with Twitter. Overall, more than two thirds of teachers reported having some type of support from their administrators. The detailed information in this section includes a side-by-side analysis of both qualitative and quantitative findings (Creswell, 2014).

Supportive Administrators

In response to the closed-ended survey question, "Do the administrators in your school or district encourage your online learning?" 68% of participants said "yes," 16% replied, "no," and 16% answered, "They are not aware of my online learning." For the 67 participants who said "yes," a follow-up question asked them to describe how they were encouraged (Table 4). Interview findings supported the survey data with almost three quarters (72%) of interviewees acknowledging having some support from the leaders in their district or school. Twenty-eight percent of interviewees reported having no support.

Table 4 Teachers' Perceptions of How Administrators Support Their Professional Learning With Twitter

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Several teachers acknowledged in the online survey that having supportive administrators contributed to their continued use of Twitter for professional learning. Most teachers reported feeling supported when they were asked to share what is happening in their classrooms via social media, as the following survey participant described: "My principal often sends links to great articles and encourages us to share what we do in the classroom on Twitter." Libby, a fifth-grade teacher, corroborated this aspect of support in her interview:

We're encouraged by the district to have class accounts for Twitter. ... I keep my professional Twitter account that I use for my professional development very separate from what my class tweets out.

Another interviewee, Jessica, described what it means when administrators truly understand the value of teachers learning and connecting via Twitter:

For those teachers who are working for principals who really get it, and they want you out there, tweeting what you're doing, tweeting what the kids are learning, tweeting what you learn from your PD, and how those impact your students and learning in the classroom.

Administrators did not necessarily have to be active users of Twitter, or even have an account, to show their support for teachers. Showing interest by inquiring where teachers learned about new ideas contributed to the sense of support that Nina, a fourth-grade teacher, described in her interview:

I wanted to incorporate hyperdocs [digital lesson plans] into my classroom, and so, of course, the principal hadn't heard of it and wondered about it and asked where I got it, and I said Twitter. You know, so he's supportive in that role. So he's not saying "OK, you can't try this or you can't do this." So in that sense I feel supported that I have the ability and the flexibility to try new things with my students that I learned on Twitter.

Margot, a second-grade teacher, expressed a similar attitude from her principal toward Twitter:

My principal is not really into social media. But she understands that I use it and that a lot of my ideas come from my Twitter account, especially. And she's never been negative about it. And I think she sees the benefits of me being interactive on Twitter and how it affects our students.

Teachers who completed both the survey and interview described feeling supported and encouraged by administrators who were also active on Twitter. Supportive administrators were described as those who retweeted teachers' tweets, liked their tweets, and shared links with them, as the following description from a participant to an open-ended survey question illustrates:

My principal has ... offered paid subscriptions to SimpleK12 [website] for PD for our iPads. Administration urges us to use TCRWP [Teachers College Reading and Writing Project] digital tools. They are also active on Twitter, follow us, like, and retweet our classroom activity posts.

Holly, a third-grade teacher, corroborated in her interview how she felt supported because of her administrator's activity on Twitter: "My superintendent actually retweets a couple of my tweets every now and

then.” Another survey participant described supportive administrators as those who provided a “list of teachers and classes on Twitter, opportunities to share learning, [and who] model social media online learning.” Allison, a third-grade teacher, said in her interview,

My principal last year ... for every tweet you got a sticker with a tweety bird. At the end of the week he gave out a prize to encourage teachers who weren't used to it, just so they would get used to it.

Teachers also viewed school administrators as supportive when PD opportunities offered included Twitter. For example, some teachers responded in the survey that they were given online PD with Twitter, such as “District has a Twitter chat once a month to encourage Twitter use across the district.”

Courtney, a third- through fifth-grade technology teacher, also mentioned this during her interview: “We have a district Twitter chat ... usually Monday nights.” Another survey respondent discussed using the district hashtag during PD opportunities, “Administrators asked us all to create a Twitter account. We use Twitter during staff development. We use district hashtags to tweet about our happenings.”

Another category that emerged from the survey included earning incentives for online learning (e.g. “We receive PD credit for online learning”). Courtney confirmed in her interview that her district gives “credit for professional development for those who submit a reflection afterward, which I think is great because that's one of the ways they are trying to get people to participate.”

In some school districts where superintendents seemed supportive of teachers’ use of Twitter, the support did not necessarily trickle down into individual schools, as Aaron, a fifth- and sixth-grade teacher, described in his interview: “So I know the overall superintendent is pushing for it, but within some schools it’s still reserved to do so there’s not much support to do things for it.” Pearl, a fourth-grade teacher, recounted in her interview how she initiated her school district into seeing the work she was doing by including them in her tweets:

The parish does retweet a lot of my tweets if I have included them in the tweet to begin with. I can honestly say that I don't think they'd ever retweeted something I've done unless I use that. It's just how they are.

The chi-square test was performed on each of the items within the two 5-point Likert rating scales. Results showed significant relationships between administrators’ support for teachers’ online learning and three areas related to the extent to which teachers used Twitter for different purposes. An alpha level of .05 was used for all statistical tests.

1. Administrators who encouraged teachers’ online learning was positively correlated with teachers who support new teachers on Twitter, $X^2(8, N = 106) = 23.06, p = .05$. Perhaps teachers transferred the support they felt from their administrators to

new teachers on Twitter, or administrators learned about how their teachers were using Twitter and showed their support for them.

2. A relationship emerged between administrators' support for teachers' online learning and teachers who provide collaborative opportunities for students in the classroom, $X^2(8, N = 106) = 17.11, p = .029$.
3. Administrators who supported teachers online learning significantly correlated with teachers using Twitter as a source of motivation in preparation to teach their lessons, $X^2(8, N = 106) = 23.06, p = .003$.

The statistical analyses also indicated a relationship between support from administrators for teachers' online learning and teachers providing collaborative opportunities for students. Teachers with supportive administrators may feel comfortable engaging their students in different types of learning situations. Carpenter and Krutka (2015) found that teachers valued their connections nationally and internationally. Especially with Twitter, teachers can connect with other teachers to arrange collaborations between their students and students around the world.

Nonsupportive Administrators

For teachers who were discouraged from using Twitter, the categories emerging from the survey and interviews included administrators who did not see the benefits of it (e.g., "They [blocked] Twitter at one point. I had to beg to get it open. They are slowly turning around and using it and see its benefits. However, no one talks about it"). Others were interested in maintaining the status quo (e.g., "Administrators in my district want to keep things the way they are. They are not looking to push forward, and they try to stamp down those who work for change"). In his interview, Aaron described a similar experience with his principal: "Mine, personally, is not that supportive of everything I want to do. ... She's been a principal for years. ... She's afraid to ruffle feathers by trying different things."

In cases with little or no support, teachers reported in the survey and interviews that administrators did not care one way or the other if they used Twitter to help them learn: "Administrators don't care about online learning. They don't see it as a legitimate source of information to really build my practice."

Stacey, a fifth-grade teacher, described herself as "purely self-motivated," having "no support or encouragement. ... There's nothing outside of just me doing it." Roxanna, a fifth-grade teacher, found herself supporting her school district: "I did actually a Twitter training for our leadership team. So, they don't support me. It's the other way around."

Aaron described explaining to his principal how Twitter can showcase classroom learning and why that may be beneficial:

So, I'm trying to show her that's how you show benefits of what schools are doing more and more of. [A student] says, "We didn't

do anything in school today.” The parents say, “There was a speaker in school. What did he say? Did you enjoy it?” So, it kind of opens up communication with parents and students, which is necessary.

Teachers also described wanting administrators to know about their use of Twitter. Diana, a second-grade teacher, felt that administrators would not understand how they learned new ideas from online social media unless they were Twitter users too:

I just think that until they actually see the benefit of us chatting with other leaders on Saturday, #satchat or #leadupchat, or become part of, like, a book club and, like, really get the support of other superintendents and principals, I don't think they're going to be able to tell teachers, “Here's where this resource is.” You know, I'm sure that it's probably a lonely island to be a superintendent if you're not connected to other leaders in the state or around the country.

Kampbell, a reading teacher, maintained that administrators do not know enough about Twitter or other social media to know how to support teachers:

We don't have a school Twitter account, which I wish we had. But he is encouraging to teachers that want to pursue Twitter accounts in their classroom. Our school does block quite a few things ... social media sites and things like that, but it does not block Twitter. ... So I would say that the administrators support it yet have very limited knowledge themselves of Twitter, how to use it, and how to use it most effectively with our teachers.

The suggestion that administrators may not know about the benefits to teachers of Twitter also emerged in a response to the following survey question: In what ways does your administrator discourage your online learning? As one teacher replied, “It is not that they discourage my online learning, I just don't think they see the real benefits it can bring to teachers.” Administrators may not consider the use of Twitter as a resource for professional learning, since its use is mostly informal and measuring specific outcomes would be an arduous task (Levenberg & Caspi, 2010).

Discussion

This study revealed the majority of participants as having support from administrators for their professional learning with Twitter. However, the data compiled from the online survey and interviews indicated different ranges of support, from administrators actively using Twitter and retweeting teachers' tweets to administrators showing interest in where teachers learned new ideas. Having an active administrator online seemed to increase teachers' perceptions that their own online learning via Twitter was supported.

Shifting Gears or Maintaining Status Quo?

Maintaining the status quo seemed to be a reason teachers in this study felt unsupported. Teachers using Twitter professionally may be viewed as “progressive thinkers” (Forte et al., 2012, p. 113) possibly challenging current teaching practices that have existed for so long, providing comfort in their familiarity (Reese, 2013). However, Bredeson (2000) argued that the role of an administrator involves the ability to “unfreeze current values, expectations, structures and processes so new ways of thinking about teaching, learning, and schooling can be considered” (p. 389).

Likewise, Carpenter and Krutka (2015) were optimistic that changes could take: “We are hopeful that the traditional school leadership might take notice [of teachers’ social media use] and find appropriate ways to empower their teachers” (p. 724).

Administrators and Teachers Interactions on Twitter

The nature of Twitter allows for frequent, brief interactions that may constitute enough of a means of administrator-to-teacher interaction to sustain a relationship. The goal would be that “once people are interacting, they must behave toward each other in ways that produce feelings of social support (House, 1981, as cited in Littrell et al., 1994, p. 308). Krutka et al. (2017) suggested that administrators should engage with teachers to help them analyze and reflect upon their professional learning networks on Twitter to ensure their intentionality of their professional learning.

Continuous and frequent communication via Twitter between administrators and teachers may enhance emotional support, which was found to be “the most important type of support that administrators can provide” (Littrell et al., 1994, p. 308). Further, the statistical analysis of data in this study indicating a relationship between administrators’ support for teachers’ online learning and their use of Twitter to get motivated to teach their lessons may reflect teachers feeling valued by their administrators to seek new ideas online to bring to their teaching practice.

While teachers seem to be utilizing Twitter to meet their professional learning needs, Bickmore (2012) found that principals valued their own informal learning experiences and recommended that they “learn how to work collaboratively in such activities as networks and study groups within and outside their own schools” (p. 109).

Having both administrators and teachers finding common ground in the ways online social media can benefit them may lead to better relationships that include continuous communication in an online space. However, Schrum et al. (2011) argued that administrators have not been prepared to understand “the challenges they will face to support the effective use of educational technology in instructionally integrated ways” (p. 242), and their analysis of individual state licensure requirements found little demand for school leaders to have this expertise.

A Critical Lens to Evaluate Information on Twitter

The findings of this study also suggest that some teachers are encouraged to use online digital tools by administrators. While these tools may be helpful in making lessons engaging for students, in the long run, teachers may be implementing short-lived fads that “fail to live up to the initial, over-inflated expectations, resulting in disillusionment” (Maddux & Cummings, 2004, p. 512).

Many educators on Twitter may promote “quick, practical, and in many cases, anecdotal solutions based on what has worked in their classrooms” (Nochumson, 2018, p. 194), yet much of the information that is shared within teacher learning communities tends to be “untested, common-sense analyses of instructional problems that actually cries out for more background study and critical analysis” (Wood, 2007, p. 728). Likewise, Nochumson found that teachers reported following highly reputable Twitter users. These users may share questionable information; therefore, it is important for teachers to determine Twitter users’ credibility before outright adopting information into their teaching practices. Administrators who are aware of recent trends and understand what their teachers are learning about via Twitter may be able to guide their teachers to focus on obtaining solutions that adhere to educational theories of how students learn (Lawless & Pellegrino, 2007).

The New Method of Teacher Supervision?

While support from administrators for teachers’ online learning may be helpful for some teachers, it is worth questioning whether administrators’ tweets, retweets, or likes will become the new method by which administrators supervise their teachers. Although many teachers expressed appreciation when their school administrators acknowledged them via Twitter, would they say that this type of interaction is adequate to meet their needs? Teachers, especially those who are technologically savvy, may be more likely to expect online connections between administrators and teachers since they are accustomed to “networking in the virtual world” (Coley, 2009, p. 21). Further, teachers who have grown up in a technological world may be more likely to “want to know if they are doing a good job and how they can improve in real time” (p. 21).

Recommendations for Future Research

Research has shown that supportive administrators impact teachers’ decisions to remain at a school (Littrell et al., 1994; Sutchter et al., 2016). However, further research is needed to determine whether administrative support for learning with social media plays a role in those decisions.

In addition, the active online presence on social media by administrators may influence teachers’ decisions about which schools or school districts to apply to work (Nochumson, 2018). Teachers may seek to work in school districts or particular schools where social media use is encouraged and supported through initiatives such as PD and active district-led Twitter chats.

Andrews et al. (2007) found that new teachers “were asking for feedback on their classroom performance in a nonevaluative way” (p. 10). The use

of Twitter to engage with teachers may in fact be a nonthreatening way of providing feedback and support to teachers.

Davis (2015) recommended that school administrators receive “training as to how Twitter may benefit teachers’ professional development and growth” (p. 1556). As Stacey, an interviewee, pointed out in her interview:

I feel like if an administrator at this point doesn't know that Twitter is valuable then they're like living in a closet. And that's a scary thing. Not to say that they all need to be using but they should all be able to see the value in it.

Cho and Jimerson (2017) found that some administrators might struggle with their use of social media knowing that they may be expected to use it in certain ways depending on their audience.

In some cases, teachers may be hesitant to use Twitter or use it more cautiously, because of the presence of their administrators or due to “an unspoken tension” (Fox & Bird, 2017, p. 668) about using online social media personally versus professionally. Fox and Bird also suggested that teachers “need to be upskilled and supported in how to capitalize on rather than be negatively affected by their digital footprints” (p. 671). Future research should explore whether administrators’ presence has a negative impact on teachers’ decisions to use social media professionally.

In light of the COVID-19 pandemic, many teachers were caught off guard as they were forced to become online teachers. The increased use of the hashtags, #RemoteLearning and #RemoteTeaching (Trust et al., 2020) demonstrates Twitter’s relevancy with teachers and their belief that they will be able to find pertinent information and resources as needed. Future research should explore what teachers learned from their use of Twitter that was then applied to their online teaching and whether administrators were supportive during the challenging and unprecedented turn of events in schooling in our world.

Implications for Policy and Practice of Teacher PD

While online learning via social media is mostly an informal endeavor, teachers need support from their school leaders. Other researchers have also made this claim, asserting that having open conversations and reflections about the role of social media in teachers’ professional learning can help reduce the challenges and provide reassurance (Carpenter & Harvey, 2019; Fox & Bird, 2017).

Almost all teachers are required to complete a certain number of PD hours each year (Kennedy, 2016). Since teachers are using online social media for their professional learning, policymakers and school administrators should consider how to formalize the online PD experience. For example, several teachers reported their districts held weekly or monthly Twitter chats in which they could participate.

School districts could host Twitter chats that are geared toward teachers’ specific needs and have experts moderate the chats to ensure the accuracy

of information. Ketterlin-Geller et al. (2015) argued that administrators can help teachers develop “expertise in evidence-based instructional design and delivery practices by providing access to current research” (p. 52). Further, Jones and Dexter claimed, “The unprecedented growth of digital technologies and the rate at which technology evolves creates a need for greater flexibility in teacher PD (professional development)” (p. 368).

Being a part of Twitter allows teachers to have immediate access to information. Creating a formal structure by which Twitter can be utilized for teacher PD would help teachers understand how to evaluate and adopt information that may contribute to successful teaching and learning opportunities.

Limitations

This study contained several limitations. First, the survey was distributed via Twitter to teachers who were already users of social media; therefore, the results may be skewed toward teachers who may hold more favorable views of Twitter. Participants may have had greater expectations for their administrators to support their online learning due to their own mostly positive experiences with Twitter.

Second, interview participants were limited to those who replied with their email addresses at the end of the survey. While attempts were made to include all of them, scheduling conflicts with potential participants resulted in only a small sample of 19 interviewees.

Third, this sample does not include teachers who may have tried using Twitter and decided, for whatever reason, it was not helpful. Thus, if school administrators were to recommend using Twitter as a resource, they may get pushback from teachers who previously used Twitter and are reluctant to try it again.

As with any qualitative research, the possibility for researcher bias exists. However, every attempt was made to present the data as objectively as possible (as recommended by Johnson & Onwuegbuzie, 2004). In addition, there are limits to surveys and interviews. For example, survey respondents are sometimes known to produce “socially acceptable answers” (Hesse-Biber & Johnson, 2015), while interviewees may aim to please the interviewer. In this study, survey respondents and interviewees may have been hesitant to express negative viewpoints about their administrators due to lack of trust that their information would remain confidential (McMillan, 2008).

Conclusion

Supportive administrators may help induce feelings of appreciation and comradery between themselves and their teachers through their continuous communication and awareness of each other’s presence online. With the COVID-19 pandemic isolating teachers from each other, support from their administrators to connect using Twitter might enable

teachers to find a community from which to learn new ideas that could be implemented to support remote teaching and online learning.

References

Abbott, M. L. (2011). *Understanding educational statistics using Microsoft Excel and SPSS (1)*. Wiley. <http://www.ebrary.com>

Abramo, J. M., & Austin, S. C. (2014). The trumpet metaphor: A narrative of a teacher's mid-career pedagogical change from formal to informal learning practices. *Research Studies in Music Education*, 36(1), 57-73. <https://doi.org/10.1177/1321103X14528454>

Andrews, S. P., Gilbert, L.S., & Martin, E. P. (2007). The first years of teaching: Disparities in perceptions of support. *Action in Teacher Education*, 28(4), 4-13. <https://doi.org/10.1080/01626620.2007.10463424>

Bickmore, D. L. (2012). Professional learning experiences and administrator practice: Is there a connection? *Professional Development in Education*, 38(1), 95-112. <https://doi.org/10.1080/19415257.2011.579004>

Bredeson, P. V. (2000). The school principal's role in teacher professional development, *Journal of In-Service Education*, 26(2), 385-401. <https://doi.org/10.1080/13674580000200114>

Britt, V. G., & Paulus, T. (2016). "Beyond the four walls of my building": A case study of #Edchat as a community of practice. *American Journal of Distance Education*, 30(1), 48-59. <https://doi.org/10.1080/08923647.2016.1119609>

Brummette, J., DiStaso, M., Vafeiadis, M., & Messner, M. (2018). Read all about it: The politicization of "Fake News" on Twitter. *Journalism and Mass Communication Quarterly*, 95(2), 497-517. <https://doi.org/10.1177/1077699018769906>

Carpenter, J. P., & Krutka, D. G. (2015). Engagement through microblogging: Educator professional development via Twitter. *Professional Development in Education*, 41(4), 707-728. <https://doi.org/10.1080/19415257.2014.939294>

Carpenter, J. P., & Harvey, S. (2019). "There's no referee on social media": Challenges in educator professional social media use. *Teaching and Teacher Education*, 86, 1-12. <https://doi.org/10.1016/j.tate.2019.102904>

Carter, J. H., & Lochte, H. A. (2016). Teacher blame and corporate gain: edTPA and the takeover of teacher education. In J. H. Carter & H. A. Lochte (Eds.), *Teacher performance assessment and accountability reforms: The impacts of edTPA on teaching and schools* (pp. 7-23). Palgrave Macmillan.

Cho, V. (2016). Administrators' professional learning via Twitter: The dissonance between beliefs and actions. *Journal of Educational Administration*, 54(3), 340-356. <https://doi.org/10.1108/JEA-03-2015-0024>

Cho, V., & Jimerson, J. (2017). Managing digital identity on Twitter: The case of school administrators. *Educational Management Administration & Leadership* 45(5), 884-900. <https://doi.org/10.1177/1741143216659295>

Colwell, J., & Hutchison, A. C. (2018). Considering a Twitter-based professional learning network in literacy education. *Literacy Research and Instruction*, 57(1), 5-25. <https://doi.org/10.1080/19388071.2017.1370749>

Coley, D. C. (2009). Leading generation Y. *Principal Leadership*, 9, 24-28.

Confessore, N., Dance, G. J. X., Harris, R., & Hansen, M. (2018). The follower factory. *New York Times*. <https://www.nytimes.com/interactive/2018/01/27/technology/social-media-bots.html>

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage.

Cuban, L. (2013). Why so many structural changes in schools and so little reform in teaching practice? *Journal of Educational Administration*, 51(2), 109-125.

Darling-Hammond, L., Banks, J., Zumwalt, K., Gomez, L., Sherin, M. G., Griesdorn, J., & Finn, L. (2005). Educational goals and purposes: Developing a curricular vision for teaching. In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world*(pp. 169-200). Jossey-Bass.

Davis, K. (2015). Teachers' perceptions of Twitter for professional development. *Disability and Rehabilitation*. 37(17), 1551-1558. <https://doi.org/10.3109/09638288.2015.1052576>

Forte, A., Humphreys, M., & Park, T. (2012) Grassroots professional development: How teachers use Twitter. *Proceedings of the sixth international AAAI (Association for the Advancement of Artificial Intelligence) Conference on Weblogs and Social Media, June 4-7 2012*. Association for the Advancement of Artificial Intelligence.

Fox, A., & Bird, T. (2017). The challenge to professionals of using social media: Teachers in England negotiating personal-professional identities. *Education and Information Technologies*, 22, 647-675. <https://doi.org/10.1007/s10639-015-9442-0>

Fullan, M. (2007). *The new meaning of educational change*. Teachers College Press.

Gaur, A. S., & Gaur, S. S. (2009). *Response books: Statistical methods for practice and research: A guide to data analysis using SPSS (2)*. Sage.

Hennessy, S. (2014). *Bridging between research and practice: Supporting professional development through collaborative studies of classroom teaching with technology*. <http://ebookcentral.proquest.com>

Hesse-Biber, S. N. (2010). *Mixed methods research: Merging theory with practice*. Guilford Press.

Hesse-Biber, S. N., & Johnson, R. B. (Eds.). (2015). *Oxford handbook of multimethod and mixed methods research inquiry*. <https://ebookcentral-proquest-com.tc.idm.oclc.org>

Hull, K., & Dodd, J. E. (2017). Faculty use of Twitter in higher education teaching. *Journal of Applied Research in Higher Education*, 9(1), 91-104.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7), 14-26. <https://doi.org/10.3102/0013189X033007014>

Kennedy, M. M. (2016). How does professional development improve teaching? *Review of Educational Research*, 86(4), 945-980. <https://doi.org/10.3102/0034654315626800>

Ketterlin-Geller, L.R., Baumer, P., & Lichon, K. (2015). Administrators as advocates for teacher collaboration. *Intervention in School and Clinic*, 51(1), 51-57. <https://doi-org.tc.idm.oclc.org/10.1177/1053451214542044>

Kimmons, R., Veletsianos, G., & Woodward, S. (2017). Institutional uses of Twitter in U.S. higher education. *Innovative Higher Education*, 42, 97-111. <https://doi.org/10.1007/s10755-016-9375-6>

Knowles, M. S. (1950). *Informal adult education*. Association Press.

Krutka, D. G., Carpenter, J. P., & Trust, T. (2017). Enriching professional learning networks: A framework for identification, reflection, and intention. *TechTrends*, 61, 246-252. <https://doi.org/10.1007/s11528-016-0141-5>

Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research*, 77(4), 575-614. <https://doi.org/10.3102/0034654307309921>

Lemon, N. (2014). Twitter and teacher education: Exploring teacher, social, and cognitive presence in professional use of social media. *Teacher Education and Practice*, 27(4), 532-560.

Levenberg, A., & Caspi, A. (2010). Comparing perceived formal and informal learning in face-to-face versus online environments.

Interdisciplinary Journal of E-Learning and Learning Objects, 6, 323-333. <https://doi.org/10.28945/1318>

Littrell, P. C., Billingsley, B. S., & Cross, L. H. (1994). The effects of principal support on special and general educators' stress, job satisfaction, school commitment, health, and intent to stay in teaching. *Remedial and Special Education*, 15(5), 297-310. <https://doi.org/10.1177/074193259401500505>

Maddux, C., & Cummings, R. (2004). Fad, fashion, and the weak role of theory and research in information technology in education. *Journal of Technology and Teacher Education*, 12(4), 511-533. <https://www.learntechlib.org/primary/p/4032/>

Marsick, V. (2009). Toward a unifying framework to support informal learning theory, research and practice. *Journal of Workplace Learning*, 21(4), 265-275. <https://doi.org/10.1108/13665620910954184>

Masterman, L. (2013). The challenge of teachers' design practice. In H. Beetham & R. Sharpe (Eds.), *Rethinking pedagogy for a digital age* (pp. 64-77). Routledge.

Mayes, T., & de Freitas, S. (2013). Technology-enhanced learning: The role of theory. In H. Beetham & R. Sharpe (Eds.), *Rethinking pedagogy for a digital age* (pp. 67-93). Routledge.

McDonald, R., & Danino, N. (2015). Social media in education and the community. In G. Brewer & R. Hogarth (Eds.), *Creative education, teaching and learning: Creativity, engagement and the student experience* (pp. 193-202). Palgrave Macmillan.

McMillan, J. H. (2008). *Educational research: Fundamentals for the consumer*. Pearson.

Merriam, S. B. (1998). *Qualitative research and case study applications in education*. Wiley.

Merriam, S. B., & Bierema, L. L. (2014). *Adult learning: Linking theory and practice*. Jossey-Bass.

Mills, M. (2014). Effect of faculty member's use of Twitter as informal professional development during a preservice teacher internship. *Contemporary Issues in Technology and Teacher Education*, 14(4), 451-467. <https://citejournal.org/volume-14/issue-4-14/current-practice/effect-of-faculty-members-use-of-twitter-as-informal-professional-development-during-a-preservice-teacher-internship>

Nochumson, T. C. (2018). *An investigation of elementary schoolteachers' use of Twitter for their professional learning*. [Doctoral dissertation, Teachers College, Columbia University]. Academic Commons. <https://doi.org/10.7916/D8QN7K9T>

Nochumson, T. C. (2020). Elementary schoolteachers' use of Twitter: Exploring the implications of learning through online social media. *Professional Development in Education, 46*(2), 306-323. <https://doi.org/10.1080/19415257.2019.1585382>

Punch, K. F. (2003). *Essential resource books for social research: Survey research: The basics*. Sage. <http://www.ebrary.com>

Reese, W. J. (2013). In search of American progressives and teachers. *History of Education, 42*(3), 320-334. <https://doi.org/10.1080/0046760X.2013.795616>

Sauers, N. J., & Richardson, J. W. (2015). Leading by following: An analysis of how K-12 school leaders use Twitter. *National Association of Secondary School Principals Bulletin, 99*(2), 127-146. <https://doi.org/10.1177/0192636515583869>

Schrum, L., Galizio, L. M., & Ledesma, P. (2011). Educational leadership and technology integration: An investigation into preparation, experiences, and roles. *Journal of School Leadership, 21*(2), 241-261.

Singer, N. (2017, September 2). Silicon Valley courts brand-name teachers, raising ethics issues. *New York Times*. <https://www.nytimes.com/2017/09/02/technology/silicon-valley-teachers-tech.html>

Slavin, R. (2007). *Educational research in an age of accountability*. Pearson.

Sutcher, L., Darling-Hammond, L., & Carver-Thomas, D. (2016). *A coming crisis in teaching? Teacher supply, demand, and shortages in the U.S.* Learning Policy Institute. <https://learningpolicyinstitute.org/product/coming-crisis-teaching>

Tadros, M. (2011). A social media approach to higher education. In C. Wankel (Ed.), *Cutting-edge technologies in higher education, 1: Educating educators with social media* (pp. 83-105). Emerald Group. <http://www.ebrary.com>

Tour, E. (2017). Teachers' personal learning networks (PLNs): Exploring the nature of self-initiated professional learning online. *Literacy, 51*(1), 11-18. <https://doi.org/10.1111/lit.12101>

Trust, T., Carpenter, J. P., & Krutka, D. G. (2018). Leading by learning: exploring the professional learning networks of instructional leaders. *Educational Media International, 55*(2), 137-152. <https://doi.org/10.1080/09523987.2018.1484041>

Trust, T., Carpenter, J.P., Krutka, D.G, & Kimmons, R. (2020). #RemoteTeaching & #RemoteLearning: Educator tweeting during the COVID-19 Pandemic. *Journal of Technology and Teacher Education, 28*(2), 151-159. <https://www.learntechlib.org/primary/p/216094/>

Vavasseur, C. B., & MacGregor, S. K. (2008). Extending content-focused professional development through online communities of practice. *Journal of Research on Technology in Education*, 40(4), 517-536. <https://www.learntechlib.org/p/106109/Fking>

Visser, R. D., Evering, L. C., & Barrett, D. E. (2014). #Twitterforteachers: The implications of Twitter as a self-directed professional development tool. *Journal of Research on Technology in Education*, 46(4), 396-413. <https://doi.org/10.1080/15391523.2014.925694>

Webb, L. (2011). Supporting technology integration: The school administrators' role. *National Forum of Educational Administration and Supervision*, 28(4), 1-7.

Whitaker, B. (1997). *Instructional leadership and principal visibility*. *The Clearinghouse*, 70(3), 155-156. <https://doi.org/10.1080/00098655.1997.10543916>

Wood, D. (2007). Teachers' learning communities: Catalyst for change or a new infrastructure for the status quo? *Teachers College Record*, 109(3), 699-739.

Contemporary Issues in Technology and Teacher Education is an online journal. All text, tables, and figures in the print version of this article are exact representations of the original. However, the original article may also include video and audio files, which can be accessed online at <http://www.citejournal.org>

Appendix A
Survey: Twitter as a Professional Learning Tool for Teachers

Q51 Hello! Thanks for clicking the link to this survey. Your time and responses are greatly appreciated. It should take about 10 minutes. Thank you so much!

Type of school

Q26 In what type of school do you currently teach?

- Public (1)
- Private (2)
- Charter (3)
- Online (4)
- Other (please specify) (5) _____

Q37 In which country do you currently reside?

Q38 In which state do you currently reside?

Q45 Which of the following best describes the number of students in the school in which you work?

- 0-100 (1)
- 101-500 (2)
- 501-1000 (3)
- 1001-1500 (4)
- 1501-2000 (5)
- 2001-2500 (6)
- Greater than 2500 (7)

Q31 What percent of your students receive free or reduced lunch?

- 0 (1)
- 1% - 10% (2)
- 11% - 20% (3)
- 21% - 30% (4)
- 31% - 40% (5)
- 41% - 50% (6)
- 51% - 60% (7)
- 61% -70% (8)
- 71% - 80% (9)
- 81% -90% (10)
- 90%-100% (11)

Q32 How many years have you been teaching at this school?

- First year (1)
- 1 - 2 years (2)
- 3 - 5 years (3)
- 6 -10 years (4)
- 11 -15 years (5)
- 16 -20 years (6)
- 21 -25 years (7)
- More than 25 years (8)

Q34 Please indicate your highest degree earned.

- Bachelors (1)
- Masters (2)
- PhD. (3)
- Doctoral (4)
- Other (5) _____

Q35 What grade level do you currently teach? (Please select more than one if you work with multiple grades).

- Kindergarten (1)
- First Grade (2)
- Second Grade (3)
- Third Grade (4)
- Fourth Grade (5)
- Fifth Grade (6)
- Other (please specify) (7)

Q36 Of the following subjects, which one are you most comfortable teaching?

- Math (1)
- Reading (2)
- Writing (3)
- Science (4)
- Social Studies (5)

- Art (6)
- Music (7)
- Physical Education (8)
- Technology (9)
- Drama (10)
- World Languages (11)
- Library/Research skills (12)
- Other (please specify) (13) _____
- ESL (14)

Q46 Of the following subjects, which one are you least comfortable teaching?

- Math (1)
- Reading (2)
- Writing (3)
- Science (4)
- Social Studies (5)
- Art (6)
- Music (7)
- Physical Education (8)
- Technology (9)
- Drama (10)
- World Languages (11)

Library/Research skills (12)

Other (please specify) (13)

Q37 Is high-speed Internet accessible at your school?

Yes (1)

No (2)

I do not know. (3)

Display This Question:

If Is high-speed Internet accessible at your school? = No

Q38 Please give an explanation as to why there may not be high-speed Internet at your school.

Q49 In your opinion, what are key components of professional development?

Q39 How long have you been an active Twitter user?

- Less than 6 months (1)
- 6 months to 1 year (2)
- 1-2 years (3)
- More than 2 years (4)

Q42 What best describes how frequently you use Twitter?

- Daily (1)
- 2-3 times per week (2)
- Once per week (3)
- 2-3 times per month (4)
- Once every 2-3 months (5)
- Once every 6 Months (6)
- Once a year (7)

Q6 To what extent do you use Twitter to do the following:

	Never (1)	A few times per year (2)	A few times per month (3)	A few times per week (4)	Everyday (5)
Participate in moderated chats with other teachers (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Connect with experts in the field of education (i.e., policy experts, professors) (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learn about subjects I am less comfortable teaching (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reflect on my own teaching practices (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ask for suggestions for classroom strategies (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Follow links to articles about education (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engage with others who challenge my thinking (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use Twitter for personal purposes (i.e. hobbies) (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engage my students in collaborative experiences with other students (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Support teachers who are new to Twitter (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Connect with the same teacher on more than one occasion (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Search for higher-order thinking activities (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Allow students to post classroom updates (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q48 To what extent has Twitter helped you do the following in your teaching practice:

	Not at all (1)	Minimally (2)	Some (3)	Quite a bit (4)	Extensively (5)
Design student-centered instruction (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Create authentic learning opportunities (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engage students in critical thinking tasks (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incorporate technology into curricular objectives (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide collaborative opportunities for students in the classroom (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhance your reputation as an educator (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get motivated to teach lessons (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Expose students to other cultures (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gain confidence in my own teaching abilities (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q48 You are doing a great job! Please keep going with the survey. Your answers are very important!

Q7 How do you decide when you need to learn something new to bring to your teaching practice?

Q8 When you want to learn something new related to your teaching what do you do?

Q9 If you answered that you use a social networking tool such as Twitter, in what way does it help you to learn?

Q11 Have you ever participated in a moderated Twitter chat? (ie., #4thchat, #edchat, #satchat)

- Yes (1)
- No (2)
- I would like to participate in the future. (3)

Display This Question:

If Have you ever participated in a moderated Twitter chat? (ie., #4thchat, #edchat, #satchat) = Yes

Q12 Please describe your experience as a result of your participation in a moderated Twitter chat.

Q13 If you learned new knowledge or skills from using Twitter, how did you apply your new knowledge and skills to your own teaching practice?

Q14 Do the administrators in your school or district encourage your online learning?

- Yes (1)
- No (2)
- They are not aware of my online learning (3)

Display This Question:

If Do the administrators in your school or district encourage your online learning? = Yes

Q15 Please describe the ways in which administrators encourage your online learning.

Display This Question:

If Do the administrators in your school or district encourage your online learning? = No

Q47 In what ways do administrators discourage your online learning?

Q16 Compared with other types of professional learning opportunities that you may have had, what does Twitter provide you with that those did not?

Q17 When using Twitter, how would you generalize about the information that you decide to pursue? (i.e., Do you click links to certain subjects? Do you follow links from users who are highly reputable?)

Q13 Have you engaged a Twitter interaction that resulted in a meaningful experience?

- Yes (1)
- No (2)

Display This Question:

If Have you engaged a Twitter interaction that resulted in a meaningful experience? = Yes

Q14 Please describe the meaningful experience as a result of your Twitter interaction.

Q15 Have you engaged in a Twitter exchange that was unproductive?

- Yes (1)
- No (2)

Display This Question:

If Have you engaged in a Twitter exchange that was unproductive? = Yes

Q16 Please describe how the Twitter exchange was unproductive.

Q19 Have you implemented new teaching methods, ideas or activities that you learned from Twitter in your teaching practice?

- Yes (1)
- No (2)
- I plan to do so in the future. (3)

Display This Question:

If Have you implemented new teaching methods, ideas or activities that you learned from Twitter in y... = Yes

Q20 How did your students respond to the new teaching methods, ideas or activities that you implemented in your teaching?

Q21 Do you share your students' work via Twitter?

- Yes (1)
- No (2)

- I plan to do so in the future. (3)

Display This Question:

If Do you share your students' work via Twitter? = Yes

Q22 How does sharing your students' work affect their performance or achievement?

Q23 Do you feel that being an active Twitter user enhances your reputation as a teacher? Please explain.

Q25 Do you feel your classroom teaching has changed as a result of incorporating ideas you have learned from Twitter?

- Yes (1)
- No (2)
- Not sure (3)

Display This Question:

If Do you feel your classroom teaching has changed as a result of incorporating ideas you have learn... = Yes

Q26 Please give an example of how your teaching has changed as a result of your Twitter use.

Q40 Learning more about how teachers are using Twitter for learning is such an important topic in today's digital world. If you would be willing to give 15 minutes of your time in a follow-up interview via Skype, Google Hangouts or Facetime, I would greatly appreciate it.

Please remember that all information will remain strictly confidential. Is it okay for me to contact you by email to set up an interview? Thank you so much for your time.

- Yes (1)
- No (2)

Display This Question:

If Learning more about how teachers are using Twitter for learning is such an important topic in tod... = Yes

Q41 Please enter your email if you agree to be contacted for a follow-up interview:

Appendix B

Interview Questions

- A large number of teachers reported that they had administrators who supported their online learning. Is that true for you? In what ways were administrators most supportive?
- Do your administrators support other teacher-led activities? If you wanted to try something new, would they be supportive?
- Would you say you have a strong community of teachers? Can you describe that?
- If administrator(s) is not supportive, what is preventing him/her from showing support?
- What do you say to people who feel that Twitter only provides superficial techniques to teachers?