



The Use of Twitter in the Creation of Educational Professional Learning Opportunities

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ABSTRACT

This study sought to examine how educators are using Twitter to increase their professional learning opportunities beyond the boundaries of traditional professional development offers, and whether educators feel a greater sense of fulfillment receiving professional development through networking and community learning than they do through traditional means of learning. A population of 160 educators—105 females and 55 males between the ages of 22 and 65—were surveyed using education related hashtags on Twitter. Thirty-two educators from the survey population elected to participate in an interview. The study discovered that educators are frequently using Twitter professionally to collaborate, network, and engage in professional development. Ninety percent of the educators responding said they are extremely likely to use Twitter for professional development in the next six months, and 69% of educators said their use of Twitter for professional learning will increase over the coming school year.

Keywords: Twitter, professional development, education, technology integration

Professional development opportunities and professional learning networks where educators meet to exchange ideas, acquire new knowledge, and receive feedback have existed almost since the beginnings of education itself (Kabilan, Adlina, & Embi, 2011; Killion, 2011). Over the course of the past ten years, technology has moved into every facet of the classroom as students and teachers are being prepared to interact with and compete in a 21st-century digital world (King, 2011). Educators must be able to navigate this world in order to prepare students appropriately. The melding of social media, professional development, and professional learning networks are expanding the way educators acquire information from “one-size-fits-all, sit-and-get professional development” (Killion, 2011, p. 4) sessions that have little transference to the classroom to highly engaging, dynamic, and interactive applications that allow for individualized learning through the management and selection of content, co-construction of knowledge, demonstration of competencies, and generation of networks for ongoing learning.

Just as education is pushing students to be accountable for their education by navigating and evaluating an ever-expanding network of information, highly effective teachers must model this process by collaborating, engaging in ongoing professional development, reflecting through communication and feedback, and using instructional technology tools to enhance instruction (Reich, Levinson, & Johnston, 2011; Trust 2012). The opportunity for asynchronous learning that occurs outside of the constraints of time and place and synchronous learning, where a group takes part in learning at the same time, allows educators to transform the traditional ideas of professional development and the creation of professional networks restricted by boundaries and time (Trust 2012). In making this transition, educators move from isolation to become true life-long learners who grow and share their expertise with others and who model this perpetual learning to students (Trust, 2012).

The way individuals are learning is changing for both students and teachers. If teachers expect to implement 21st-century learning in classrooms to prepare students to succeed in today's globally connected and emergent world, teachers must develop their own expertise with new learning technologies (Killion, 2011, p. 3). Professional development is currently one of the main pathways to improving student learning and to increasing job satisfaction. However, recent trends in education and education financing for schools have put constraints on schools and districts in terms of the professional development opportunities and resources being offered and made available (Killion, 2011).

Our research is in response to the question concerning whether educators are turning to Twitter to create, use, and manage professional learning networks for professional development, and if online professional development facilitated by Twitter is more fulfilling than traditional professional development. This study sought to identify a correlation between those who engage in the self-directed creation of professional learning networks for professional development and those who find and experience greater satisfaction, learning, and application of knowledge gained in more traditional professional development opportunities. By means of data gathered quantitatively through a Likert scale survey and qualitatively through interview questions tweeted to various education related hashtags on the social media platform Twitter, this study will add to the body of research focused on shedding positive light on the use of Twitter for professional development.

LITERATURE REVIEW

Traditional Professional Development

Professional development comprises those skills and knowledge attained for both personal growth and career advancement. Traditional models of professional development include courses offered by school districts, universities, technical assistance agencies, professional associations, nonprofit organizations, and for-profit vendors. These models of delivery, however, are not providing the meaningful experiences required to enhance teachers' professional learning and competencies (Kabilan et al., 2011). The professional development being offered lacks pedagogical content and structural characteristics and merely repeats what has previously been studied during the initial phases of teacher education in college (Kabilan et al., 2011).

Effective Professional Development

Professional development should be *praxis* oriented, allowing educators to continually learn from each other as they engage in interplay of reflection and action (Reich et al., 2011). Studies by Bauer (2010), King (2011), and Reich et al. (2011) have shown that extended experiences of professional learning that are ongoing, rather than concentrated, are more beneficial. Additionally, effective professional development should engage educators in learning that is both dynamic and flexible; it should take advantage of mentors and both formal and informal modes of learning to enhance teachers' awareness of their own strengths, weaknesses, practices, and philosophies (Bauer, 2010; Kabilan et al., 2011). Beach (2012) defined the desired qualities, stating that effective professional development is

flexible, provides sustained follow up, includes on-going coaching, engages teacher in active learning experiences with teaching methods, focuses on integration of specific subject matter content, involves reflection on instruction and beliefs, fosters collaboration with colleagues, and examines the impact of instruction on student outcomes. (p. 256)

In contrast to traditional models of professional development that focus on a set criterion of goals in order to meet the various needs and levels of educators in attendance, effective professional development does not need to be a focused effort; it may simply be the response to a self-directed, professional and academic curiosity through a virtual dialogue with educators of like minds (King, 2011). Part of increasing effectiveness of professional development is to "grow the teaching of digital literacies" and by "capitalizing on the affordances of digital tools and social networking capabilities to collaborate, plan with, and learn from other teachers" (Beach, 2012, p. 256).

Connectivism, Networking, and Community Learning

Technology has reorganized the way living, communicating, and learning occur, and learning principles and process should reflect these changes in social environments (Siemens, 2005). Connectivism, a learning theory based on the premise that learning and knowledge rest in the diversity of opinions through the formation of connections, has emerged to explain how learning is interwoven with the creation of meaning by the sharing of social and historical practices, forming identity, and belonging to a community (Killion, 2011; Mackey & Evans, 2011; Siemens, 2005). In a network-based learning theory, individuals share knowledge with organizations and institutions, the nodes of the network responsible for learning exchange, which then delivers knowledge back to the individual, fostering continued learning (Siemens, 2005). Connectivism uses social learning to provide merit in the "multimembership of communities of practice, enabled by e-learning and virtual learning environments" (Mackey & Evans, 2011, p. 3). In a *Principal Magazine* interview, George Couros, Principal of Forest Green School in Alberta, Canada and author of the "Connected Principals" blog, agreed with the connectivist learning theory:

It is through conversation and connections that our learning really develops. Learning should be social, but, in our time, it should not be limited only to the divisions/districts or schools that we are a part of. We have an opportunity to connect with people and ideas all over the world. (Social Media as a Professional Tool, 2011, p. 36)

Community Learning through Social Networking

No longer made up of the familiar four walls of a schoolhouse and the surrounding community, the school community extends beyond geographic boundaries (Social Media, 2011). Social networks promise a potentially vast reservoir of information for educators who are actively engaged in the connected network learning opportunities and who embrace connectivism and the need for integration of new ways of learning. The National Education Technology Plan calls for improving learning through “connected teaching,” where teachers “connect to content, expertise, and activities through online communities” (Office of Educational Technology, 2010, p. 42). The National Education Technology Plan also calls for social networking sites to become an integral role in teacher preparation and ongoing professional development. The timeliness, immediacy, and “just-in-time” learning that social media affords allows for emphasis to be placed on personalized, collaborative, and student-centered learning (Demski, 2012, p. 45).

Counterintuitive to what many accept as appropriate means of acquiring professional development, access to community learning through social networking allows for self-directed, voluntary, and informational learning that rejects isolated learning experiences in favor of “dynamic collaboration and dialogue inherent to life-changing online professional development” (King, 2011, p. 40). Social media provides not only immediate access to information and learning opportunities, but access to authentic global audiences, multimodal means of communication, meaning making and knowledge, expert and immediate feedback, and vast opportunities for identity development (Craig & Stevens, 2011; Kabilan et al., 2011; King, 2011; Mackey & Evans, 2011; Reich et al., 2011).

Professional Learning Networks and Professional Growth through Twitter

Professional Learning Networks (PLNs) are defined as a system of interpersonal connections and relationships and resources that support information learning (Trust, 2012). These networks provide connections to others worldwide who can offer support, feedback, and collaboration opportunities that allow educators to stay up to date on the latest teaching techniques, pedagogies and practices, and updates in the field of education (Beach, 2012; Cox, 2010; Dobler, 2012; Killion, 2011; Trust, 2012). Twitter fills the gap in face-to-face professional learning by allowing these connections to take place and providing opportunities for educators to share information, knowledge, resources, classroom experience, as well as to collaborate and reflect with other educators (Cox, 2012; Dobler, 2012; Killion, 2011; Trust 2012).

Echoing connectivist learning theory, the concept behind PLNs and professional growth through Twitter allows educators to transform the paradigm of the isolated teacher into that of a lifelong, connected learner. Novice teachers engaged in collaboration and reflection with PLNs and receiving feedback from veteran teachers, who are also engaged with the same PLNs, benefit through the application of praxis and world knowledge afforded through this collaboration and reflection (Beach 2012; Craig & Stevens, 2011; Kabilan et al., 2011; King, 2011; Mackey & Evans, 2011; Reich et al., 2011; Trust 2012). Twitter supports teachers’ PLNs by creating and facilitating interactions among the educators involved in connected, collaborative, and interactive meaning making.

Summary

The literature indicates that the integration of technology into life, communication, and learning has shifted the ways meaning-making and knowledge occur. Educators worldwide are experiencing a shift in their own learning and professional growth by seeking alternatives to traditional professional development in favor of networking. The change in how knowledge and true understanding is acquired has helped facilitate this movement toward effective professional development by reinforcing the ideas of ongoing collaboration, connection, and reflection. Social networking such as Twitter provides the access for teachers to create thriving PLNs that offer immediate feedback, resources, support, and knowledge. Further research is needed to determine exactly how teachers are engaging with their PLNs, how successful PLNs are in providing feedback, resources, support and knowledge, and whether there is a shift from traditional models of professional development to collaborative and asynchronous professional development.

METHOD

Participants

The participants in this study were pre-service, current, or retired educators and persons serving in a variety of support and leadership roles in various branches of education from around the United States and the world. Table 1 provides a breakdown of the education-related hashtags on Twitter that were used to access the subjects for this study. Subjects who clicked the hyperlink in the tweet and selected to participate were informed of their option to not respond, and they were informed that their response and submission of any portion of the survey was considered as their option to participate and as permission to use their anonymous data. Educators in EC-12, administrative roles, higher education professor positions, support roles, policy makers, Educator Service Centers, and professional development providers were all represented through the responses.

Participants had the option of deciding whether or not they would like to be contacted for further information regarding clarification and additions to their responses. Tweets were sent out with a different link to the interview questions on a Google Form to those who indicated on the survey that they would be interested in providing additional information. Interview questions sought information regarding uses of Twitter for professional growth, whether Twitter was used for enhancing the professional development experience, and whether they felt more fulfilled using Twitter for professional development or more fulfilled attending traditional professional development.

Responses to the survey totaled 160; the youngest responder was 22 and the oldest responder was 65. The average age of respondents was 40 years of age. There were 150 females, 66% of the survey population, and males represented 34% of the survey population, a total of 55 individuals. The geographical locations of educators who use Twitter were from around the world. Responses were received from 32 of the 50 states within the United States, with the majority of responses centered on three general locations: the state of Texas, the Upper Mid-West, and the East Coast. Responses were received from six out of ten provinces of Canada. The European continent showed responses from the

countries of Ireland, England and Wales of the United Kingdom, Germany, and Sweden. Asia reported one response from the country of Saudi Arabia.

Table 1
Education Related Twitter Hashtags

Hashtag	Content Area	Weekly Synchronous Opportunities
#edchat	General education related topics	Tuesdays
#engchat	English Language Arts	Mondays
#ntchat	Education related topics and support central to new and pre-service teachers	Wednesdays
#sschat	Social Studies	Mondays
#mathchat	Mathematics	Mondays
#scichat	Science	Tuesdays
#txed	General education related topics specific to the state of Texas	Wednesdays
#cpchat / #satchat	Connected principals and administration related topics	Saturdays

Instrument

This research used a mixed method of a quantitative survey and qualitative interviews. The survey gathered demographical data through user input and made use of three varying Likert-scale systems. When “frequency of general use” was measured, the survey range was *Never, Less than once a month, At least once a month, At least once day, and Several times a day*. When “reasons for Twitter use” was measured, the response range was *Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree*. When “frequency of professional development use” was measured, the survey range was *Never, Rarely, Sometimes, Occasionally, and Frequently*. While the response range from “frequency of professional development” and “frequency of general use” were worded differently, they were designed to measure similar output of tweets and degree of participation. The interview questions tweeted at the conclusion of the survey were open-ended in nature and measured specific uses of Twitter for professional development.

Procedure

For two weeks, a tweet was sent once a day seeking participants to respond to a web-based Google Form survey which sought demographical information, average time use of Twitter, average uses for Twitter, professional development uses for Twitter, and satisfaction of professional growth and PLNs (see Figure 1).

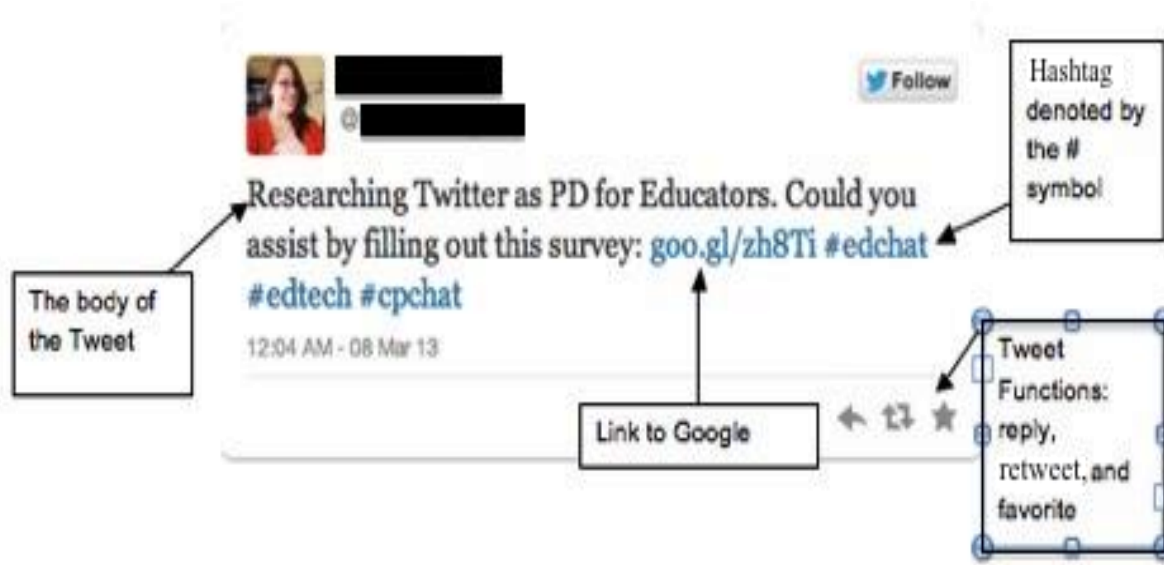


Figure 1. Anatomy of a Tweet. This figure illustrates the various parts to a Tweet.

Limitations

When interpreting the results of this study, readers should take into account the following limitations, which may affect the generalizability of the results. Given that Twitter is an open social media platform, it was not possible to distinguish how many active users were accessing Tweets at a specific point in time. The responses collected came from current active Twitter users, compelling an assumed level of associated bias.

In view of the fact that the survey and interview questions were openly accessible to all persons globally who follow hashtags utilized in the research, follow those who retweeted aforementioned instruments, and/or follow the researchers, the respondents could not be randomly selected nor assigned to experimental or control groups. Furthermore, although hashtags related specifically to education were employed, there was no way to determine if only educators accessed these hashtags. Therefore, limitations were placed on the data collected.

Finally, because live interviews using Twitter are neither currently preferred nor professionally endorsed methods of data gathering, the methodology used may affect the reaction of readers. With this in mind, it should be noted that the purpose of the study was to identify a correlation between those who engage in the self-directed creation of professional learning networks for professional development and those who find and experience greater satisfaction, learning, and application of knowledge gained in more traditional professional development opportunities. There was no attempt made by the researchers to test the efficacy of the technology.

RESULTS

Educators Using Twitter

Of the 160 survey responses, 98% of responders said they view and post tweets. A total of 80 (50% of responders) have been in the field of education for 6-15 years. Each category of years of service had educator representatives (see Figure 2). Twenty-five percent of those surveyed have an *English/Language Arts* background. *Science and Social Studies* educators represented 13% and 14%, respectively. Twenty-six percent of those surveyed selected the choice *Other* and identified several background representations: *School Psychology, Special Education, Instructional Technology, Physical Education, and Foreign Languages*.

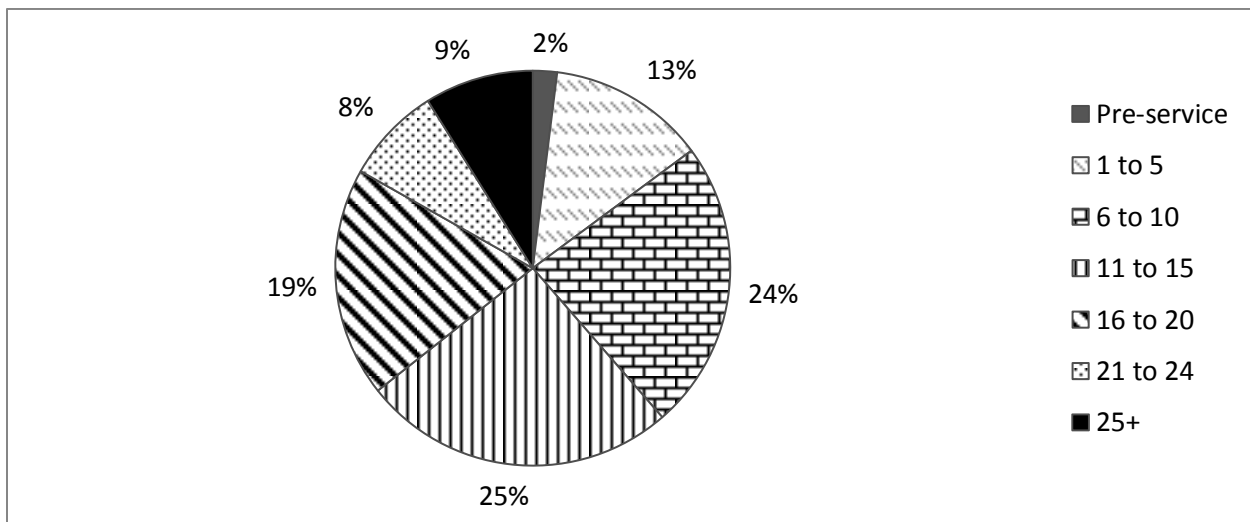


Figure 2. Years of experience in an education related field. This figure illustrates respondents' years of service in education and the total number of respondents at each category. Years 6-10, 11-15, and 16-20 showed the greatest number of responses. Pre-service teachers represented 2% and educators with 25+ years of service represented 9% of the population.

Various roles in education were represented from the 160 responses. The role of *Teacher* accounted for 89 of those surveyed. The next largest role was that of *Administrator* at 18%. Almost every role in education was accounted for, including *Pre-service Teachers, a Teacher who is also a student at a higher education institution, Education Professional Development Service Providers, Retired Educators, and Education Policy Makers*. Of the 22 individuals who responded with a role of *Other*, the common factor among this population was the role of *Instructional Coach* for a campus or a district. The role of instructional coach is different from that of an instructional assistant because the instructional coach serves in an administrative capacity to train teachers, while the assistant provides classroom teachers assistance in teaching students. Of the total population, 5% were educators teaching at an institution of higher education. Educators who selected the role of *Pre-service Teacher, Teacher, or Administrator*

selected a grade level which represented the approximate age of the students taught. There were only two Head Start or pre-kindergarten educators represented. The 7% who selected *Other* did not specify their grade level. *High School* was represented by 36% of the educators, and *Middle School* comprised 25% of the survey group. Intermediate and Elementary educators totaled 13% and 18% respectively.

There were 120 educators serving in a leadership capacity for a total 75% of those surveyed. Leadership roles identified included *Superintendent of a School District, Principal of a Campus, Associate Principal of a Campus, Program director, Grade Level Leader, and Department Chair*. Of the specific leadership roles identified, *Department Chair*, which is a classroom teacher serving in a leadership role over other teachers related to their content area, was represented by 20% of those who responded.

Frequency of Posting on Twitter

When looking at frequency of posting on Twitter, participants were asked how often they generally posted. Forty-two percent of educators responded that they posted several times a day. Other designations that received a moderate distribution were *at least once a day* at 23% and *at least once a week* at 24%.

Twitter users can produce six different types of interactions on Twitter: Tweet, Reply, Retweet, Mention, Direct Message, and List. The survey used these six functions to gauge the frequency of the interactions of educators on Twitter. A *tweet* is designated as the educator sending out an original composition. A *reply* is the designation given an original composition that extends the conversation from a tweet that another person has created and published. *Retweets* occur when an educator merely repeats the microblog posting of another Twitter user. A *retweet* typically has no original additions from the educator, and, often times, retweets have links to additional resources.

Twitter has a built-in function that allows one Twitter user to *direct message* to another user who follows them. This information is kept between those two parties and is considered private information. The *list* feature in Twitter allows users to categorize and group together other users they may or may not follow. Using this function allows Twitter users to restrict the information that they receive by looking specifically at those users they have listed. *Mentioning* in Twitter is the act of creating original content and including a specific user who will receive that information in the tweet regardless of whether or not they follow the sender. Mentions can also be seen by anyone who follows the sender, even if they are not cited in the tweet specifically. Mentoring is intended to create a direct conversation with others, even though that conversation is open for others to read and presents an opportunity for those not mentioned to join the conversation. The frequency of posting on Twitter for the six subgroups of actions showed a wide range of activity with tweeting, retweeting, and replying occurring the most frequently.

Of the educators who responded to the survey, a total of 96 individuals (60%) retweet others at least once a week. Educators' use of *direct messaging* showed a significant decrease in frequency of use over other types of posting—only 15% of surveyed educators engage in this activity at least once a day. Results indicated that 44% of educators surveyed never restrict their tweeting by using a *list* function. Of the educators surveyed, a 60% majority indicated that they use mentioning at least once a week or

more frequently. Fifty-five percent of respondents tweeted at least once a day or more frequently, and 40% replied to a conversation at least once a day or more frequently.

Uses of Twitter

Educators surveyed were asked to select the types of content they viewed on Twitter. In addition to education related topics, several options were given that did not pertain to education. Respondents were instructed to select as many as applied. While all 21 categories registered at least one response, the categories of *Education* and *Technology* excelled over all others; *Education* accounted for 18% of selections received. In a more specific perspective, 158 survey participants (99% of the population) selected *Education* as the type of content they view most on Twitter. *Technology* was the second highest, with 11% of selections over other categories. *World and Local News* received equal amounts of selections and totaled 8%, each respectively, of the category selections.

General uses of Twitter received relatively high responses of agreement. Ninety-two percent of educators agreed or strongly agreed that Twitter's ease of use was one of the reasons they use Twitter. Coinciding with this data, 86% of respondents agreed or strongly agreed that one of the reasons they use Twitter is because it is easy to learn. Additionally, 93% of those surveyed agreed or strongly agreed that they use Twitter because it is free.

Participants were asked to respond to a set of statements designed to measure the reasons why they use Twitter. The scale respondents used included a range of choices: *Strongly Agree*, *Agree*, *Neutral*, *Disagree*, and *Strongly Disagree*. Responding to their use of Twitter to communicate and keep up-to-date with friends and relatives, 67 respondents, 42%, were neutral, while 30% disagreed or strongly disagreed. Using Twitter for information sharing was assessed, and an overwhelming majority of 147 respondents, 92% of the total survey population, agreed or strongly agreed that they use Twitter because it saves time in sharing information. Data showed that 86% of those surveyed agreed or strongly agreed that they use Twitter to get encouragement from others. In use of Twitter to form a support network for encouragement, 108 educators surveyed agreed or strongly agreed that they use Twitter because they feel a sense of belonging. Sixty-one subjects remained neutral to using Twitter to find new friends, while 22 disagreed and 11 strongly disagreed with this statement.

PLNs offer collaboration and sharing of resources and information that lead directly to professional development. A social network is a place of common interest where users share general resources and non-specific information. Subjects were asked to rate their use of Twitter to maintain and establish a social network or to maintain and establish a PLN (see Figure 3).

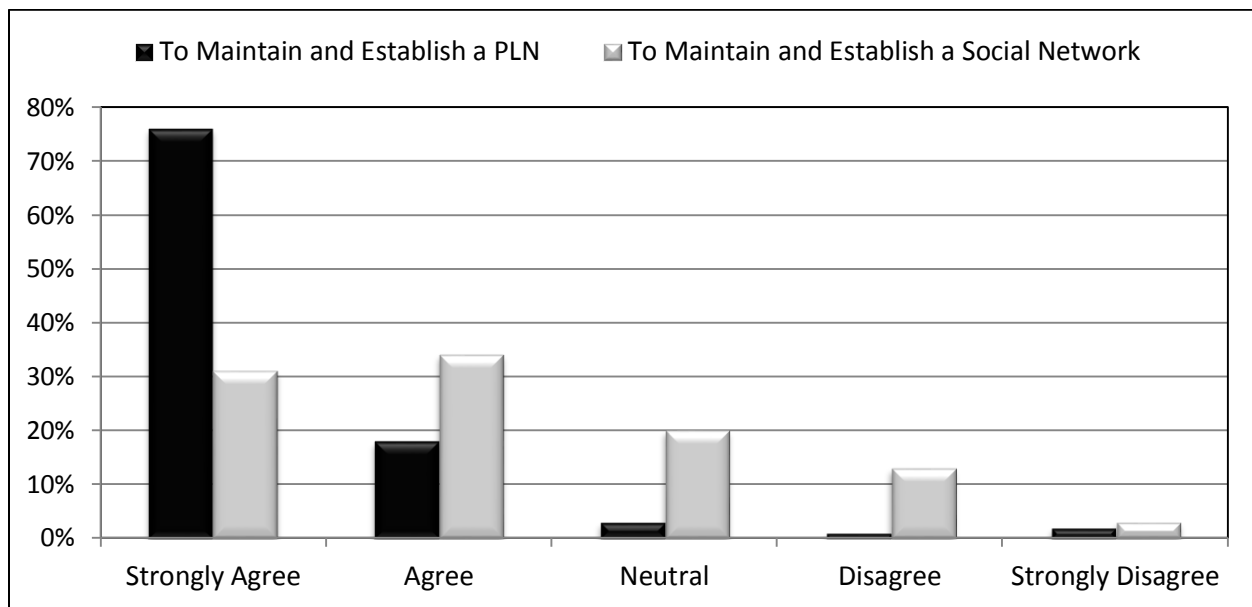


Figure 3. Use of Twitter to maintain and establish a PLN or social network. Finding new friends is a social activity on Twitter, and 38% of respondents remained neutral to using Twitter to find new friends while 14% disagreed and 7% strongly disagreed with this statement. Responses to using Twitter to maintain and establish a professional learning network (PLN), a professional activity, did not vary among the five rating categories as 121, 76% of the survey population, strongly agreed that the reason they use Twitter is to maintain and establish a PLN.

Professional uses of Twitter. While looking at basic uses of Twitter in an effort to rule out mundane activities and find support for uses associated with professional development, the research tool looked specifically at the professional uses of Twitter. The scale used was *Frequently, Occasionally, Sometimes, Rarely, and Never*. In relation to time frames, *Frequently* equaled once a day to several times a week, *Occasionally* equaled once a week, *Sometimes* equaled once every few weeks to once a month, and *Rarely* equaled once every few months. The quality of *Never* meant that at no point in time had the respondent used Twitter for the professional activity listed.

Participants were asked how frequently they used Twitter to collaborate with other colleagues in education (see Figure 4). The survey then looked at learning through PLNs, with subjects responding to how frequently they use Twitter to network with colleagues (see Figure 5). As well as learning through Twitter, the research instrument looked at respondents' use of Twitter to participate in professional development (PD) (see figure 6).

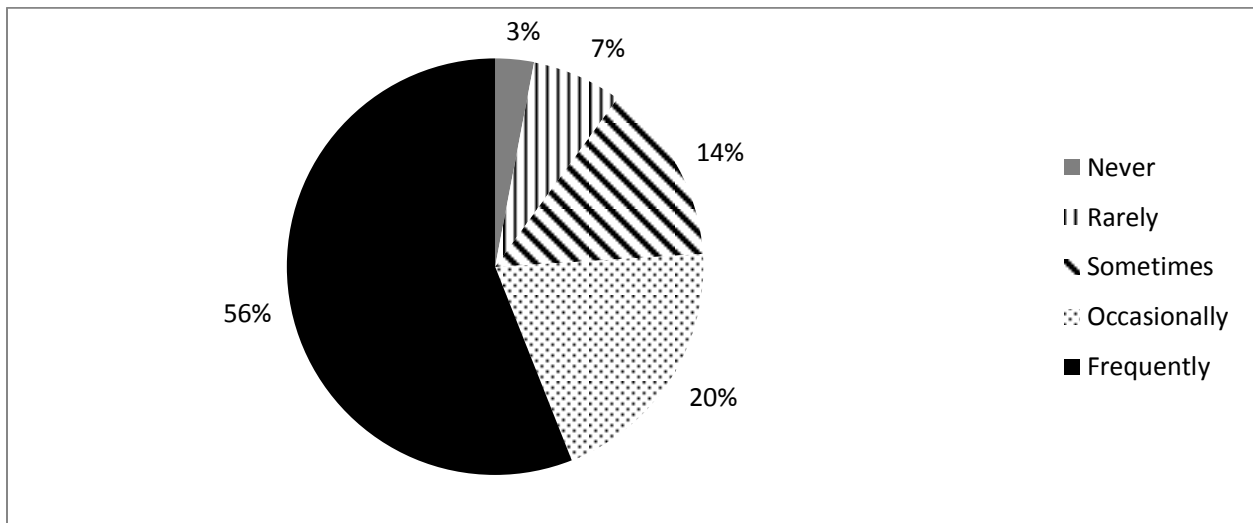


Figure 4. Frequency of collaborating professionally on Twitter. The majority of respondents use Twitter to collaborate professionally at least once a day to several times a week. The majority of respondents, a total of 90 individuals or 56%, indicated that they frequently use Twitter to collaborate professionally, and an additional 20% of participants indicated that they occasionally use Twitter to collaborate professionally. Only 5 individuals responded that they never use Twitter to collaborate professionally. The data indicates that educators are using Twitter to collaborate professionally multiple times a week.

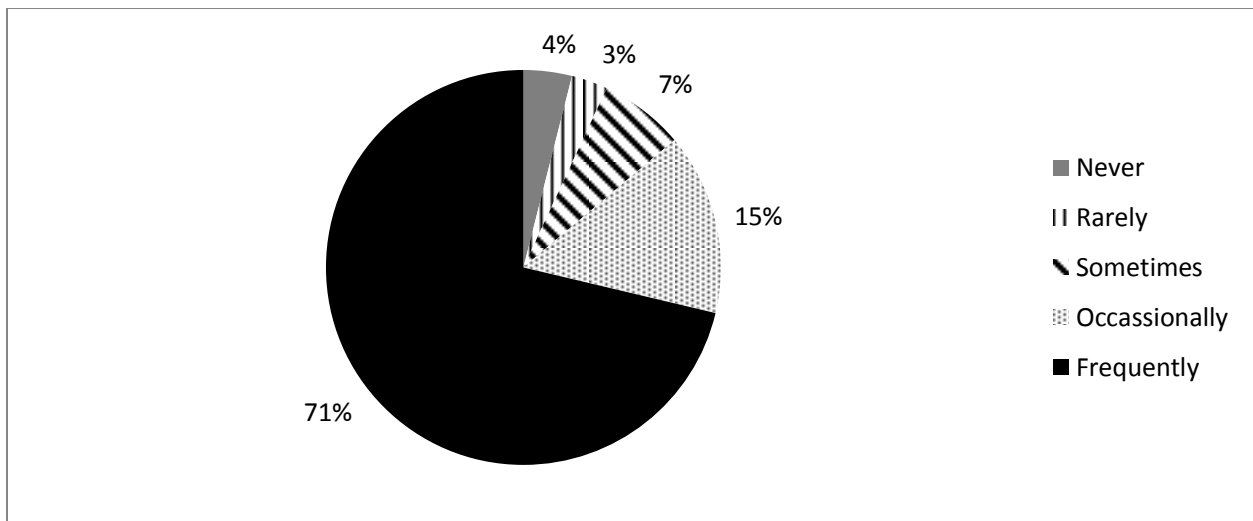


Figure 5. Frequency of networking professionally on Twitter. Educators who responded are networking professionally with colleagues at least once a day to several times a week. The majority, 115 individuals or 72% of the survey population, responded that they frequently use Twitter to network professionally. Only 4% of the survey population responded that they never use Twitter to network professionally with colleagues.

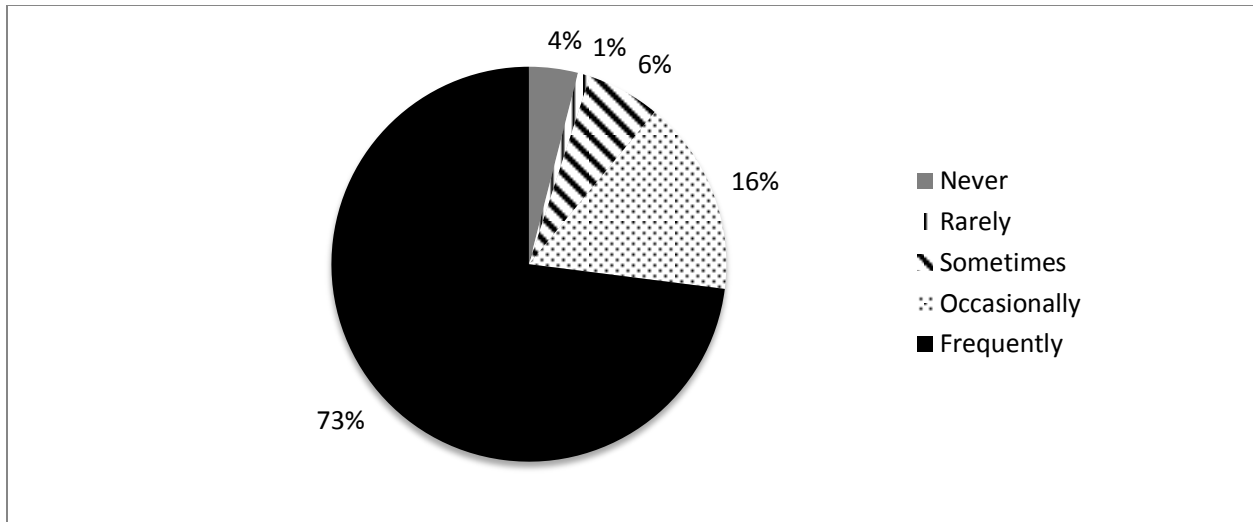


Figure 6. Frequency of using Twitter to engage in professional development. Results were clear as 73%, selected that they use Twitter for this goal frequently, and only 4% selected that they never use Twitter in this capacity

Interview responses gave deeper insight into the use of Twitter for PD. Responses centered around personalization, collaboration, and immediacy of information and resources. Participant A stated that “it meets my needs, anytime and anywhere, with deep thinking by smart people in the field,” and Participant B enjoys the personalization because “it gives me PD that fills my needs.” Participant C further explained the benefit of personalization:

Instead of seeking out conferences and attending endless hours of PD on a narrow topic from the perspective of one person, I can easily learn and discuss new ideas, new initiatives, new practices, and new philosophies in a time that doesn’t interfere with my teaching or family.

Additionally, Participant D corroborated Participant C’s response by explaining that educators “find things out for [themselves] rather than being sat in a lecture with presenters who do not follow the basic principles they are trying to teach me.”

Twitter for personalized professional development. As with comments on personalization, respondents praised the use of Twitter for professional development because of collaboration opportunities. Respondent A explained that professional collaboration on Twitter “allows for networking and sharing ideas with people that I ordinarily wouldn’t encounter—from all part of the world.” Respondent B provided a specific example of use of professional collaboration to enhance classroom instruction:

I use Twitter daily to collaborate with other teachers on projects for my 7th grade [Language Arts] classes, to learn new way to motivate students to read more, to find quality young adult literature to read, to learn about new technology, and to reinforce ideas or to challenge ideas I've had.

Twitter for collaborative professional development. Respondent C used Twitter for professional collaboration because of a small school district: "I'm not just limited to the people in my school building for advice. I can be connected with people all over the country or world that are exploring ideas that I'm exploring." Respondent D provided a similar response to Respondent C, but expanded that the collaboration "is an easy way to glean new ideas to reinvigorate teaching and learning."

Twitter for immediate professional development. Information and resources and the speed at which these can be gathered garnered responses from many subjects. Subject A explained that Twitter is a "dynamic, responsive, and asynchronous resource." Subject B's statement agreed with Subject A, but added that Twitter PD is "more up to date and relevant than any PD course I have ever been on." Subject C's statement added to the immediacy of the information and professional development because educators used "Twitter [because] it is 'ahead' and visionary, so I get in contact with the most progressive and influencing teachers of my country." Subject D admitted to being "a bit skeptical at first" on using Twitter for PD, but a further explanation indicated that he/she was converted to using Twitter for PD because it "provides a steady, succinct stream of curated sources for professional development."

One participant summed up the reasons why educators who responded to the interview used Twitter for PD:

Because it offers a medium for connecting with others. For instance, I can track hashtags and get access to ideas and materials I'd not easily find in my school resource room. I can also use Twitter to enable other folk's professional development—which I do by having a daily schedule of education-relevant Tweets from 3 a.m. to 11 p.m., Pacific Time. In this way, I hope to positively engage Twitter to enable other teachers' professional development.

Twitter's future for professional development. The survey looked briefly at future use. Subjects were asked how likely they were to use Twitter for professional purposes in the next six months. Respondents had a choice of *Extremely likely*, *Very likely*, *50/50 chance*, *Somewhat likely*, *Not likely at all*, and *Other*. The majority of respondents, 144 individuals or 90%, indicate that they are extremely likely to use Twitter professionally within the next six months (see Figure 8). Only one respondent selected other, but did not specify the reason for the selection. The data indicates the majority of educators are currently using Twitter for professional purposes, and this activity will continue to occur. An overwhelming majority of 90% of respondents project that they are extremely likely to use Twitter for professional purposes over the next six months.

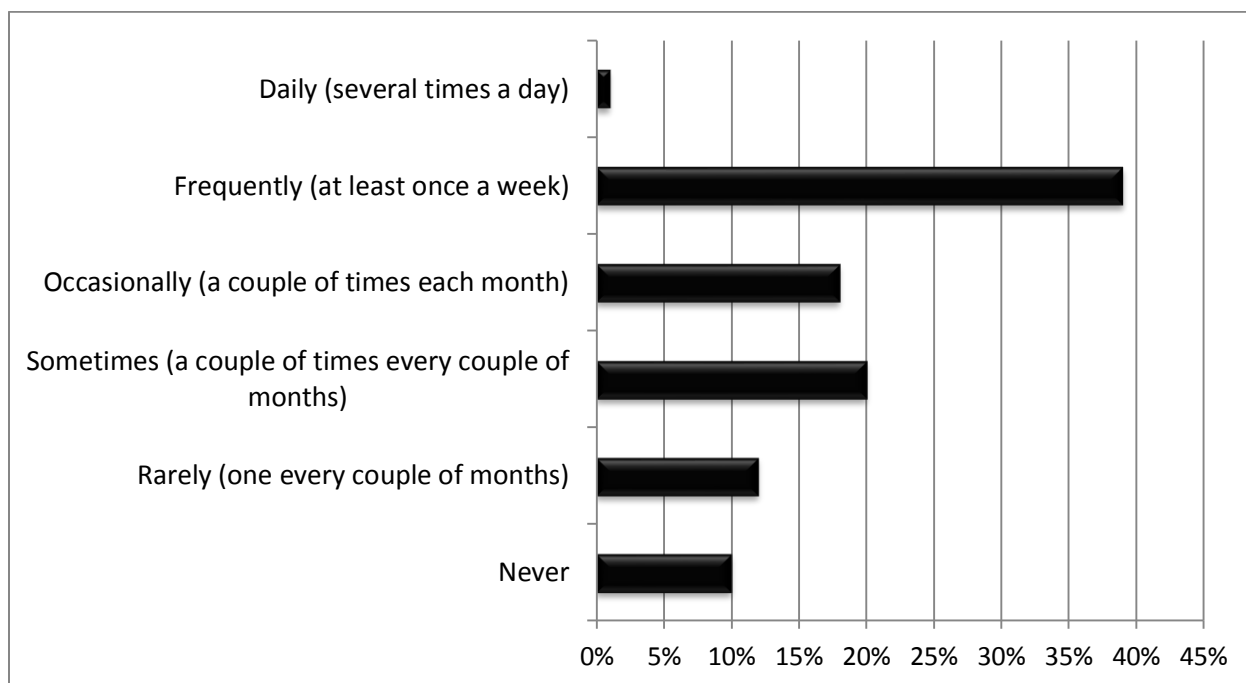


Figure 8. Frequency of participating in SLOs through weekly education related chats. Participants responded that 62 individuals, 39% of the survey population, participated frequently, at least once a week, in SLOs, and 16 individuals, 10% of the population, never participated in SLOs. Two individuals selected “Daily” as their response.

Respondents were given an open-ended response opportunity if their preferred professional activities on Twitter were not listed. Participant A specified that Twitter was used to “connect with teachers around the world,” and Participant B used Twitter to “share information with colleagues and to commend colleagues on their achievements and good work.” Participant C summed up this concept of connecting through Twitter to “idea and resource gather.” A more specific comment from Participant D was geared specifically toward professional development (PD); he/she used Twitter to “develop PD session ideas.” Research on education topics was another area of professional use. Participant E used the “hashtags to research education topics,” and Participant F indicated that Twitter was used professionally to “keep up to date with research, both scientific and educational.” Other professional activities on Twitter included: job hunting, following Twitter chats, and education activism.

Learning Opportunities and Professional Development

Twitter can be used as a backchannel for learning that happens in a nebulous atmosphere alongside traditional professional development. Thirty-two of the survey respondents (20%) elected to provide discussion responses. As part of the qualitative interview, subjects were asked to respond to whether or not they used Twitter as a backchannel to expand the learning opportunities associated with traditional professional development. Collaboration responses focused on connecting with others and sharing of

information; organization responses centered on the concept of note taking; and enhancement focused on reflection and additional learning opportunities alongside the professional development being offered. Of the 32 who responded, 1 participated strictly in organization; 3 participated strictly in collaboration; 3 participated strictly in enhancement; 0 participated in organization and enhancement; 2 engaged in collaboration and organization; 12 engaged in collaboration and enhancement, and 3 participated in collaboration, organization, and enhancement. Three responses did not match any category and were removed from the figure's results. The majority of subjects (84%) affirmed their use of Twitter as a backchannel, while 16% indicated that they did not use Twitter as a backchannel. Providing additional insight on using Twitter as a backchannel, respondents focused on three areas of benefit: collaboration, organization, and enhancement

Respondent A discussed that using Twitter as a backchannel "extend[s] the discussion beyond just the people in the room [and] not only brings value to me but helps bring outside opinions into the traditional PD." Respondent B used Twitter as a backchannel to "find specific resources I can use in my classroom if the training is too general." Respondent C found it helpful to use Twitter to take "notes for the PD that I share with my PLN—allows my notes to be interactive"; this allows for collaboration and organization to enhance learning. The use of Twitter as a backchannel provided Respondent D with "more personalized feedback" and Respondent E with a "great formative assessment check to see if I'm learning what I'm supposed to be learning." Respondent F provided a detailed explanation of why using Twitter as a backchannel to PD provides benefits of collaboration, organization, and enhancement:

In a traditional setting, only a few people are able to question or comment, and I know that in a room full of educators there are many more discussion points and ideas to be shared than the time and space will allow for. Twitter helps to support and reinforce the learning in the PD by giving a place to share and discuss. Twitter seems to help things move forward as well so time isn't hijacked by one or a few attendees with an agenda. It helps my time spent in PD to be more applicable and relevant.

With the exception of using Twitter as a back-channel to PD sessions, asynchronous and synchronous learning opportunities are the most direct line to professional development for educators. Asynchronous learning opportunities (ALOs) occur whenever the respondent has a desire for information and actively uses Twitter to seek out that information. Respondents were asked how frequently they participate in ALOs through the use of hashtags related to education (see Figure 7).

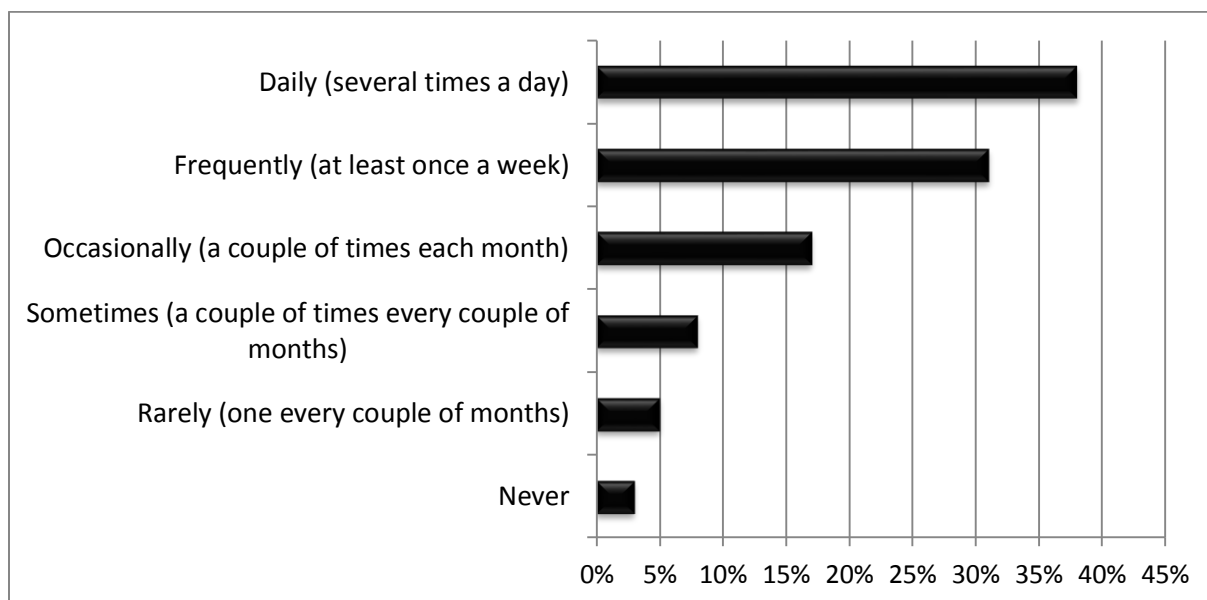


Figure 7. Frequency of participating in ALOs through education related hashtags. Results showed that 60 individuals, 38%, used Twitter daily and up to several times a day for ALOs, and 49 respondents, 31%, engaged frequently, at least once a week, in ALOs. Only four participants responded that they never participate in ALOs.

Synchronous learning opportunities (SLOs) occur at a specified time through a specified education-related hashtag where educators from around the world have an opportunity to enter into a collaborative learning discussion. Subjects were asked how frequently they participated in SLOs through weekly chats related to education (see Figure 8). It should be noted that participants might have participated in multiple SLOs on a single day because individual education-related hashtags each have independent chats that can occur simultaneously as another chat. While the survey did not look specifically at the number of SLOs entered into, the total frequency of SLOs could be quite higher than the data originally indicated.

Subjects were asked to project their expectations for using Twitter for professional learning opportunities (PLOs) in the coming school year. Participants had the option of responding to whether they predict an increase, a decrease, remain the same, or other. The majority of educators in the survey population (110 or 69%) indicated that they expect their use of Twitter for PLOs to increase. Forty-nine individuals (30%) expected their use to remain the same; only one individual predicted a decrease in use.

Sense of Fulfillment: Twitter versus Traditional Professional Development

Thirty-two subjects (20% of the survey population) elected to participate in interview questions. Interview subjects were asked to identify whether they felt more fulfilled receiving PD via Twitter or

more fulfilled receiving traditional PD. Of those who elected to respond, 71% felt more fulfilled receiving professional development via Twitter, while 21% felt a greater sense of fulfillment receiving professional development via traditional delivery.

Discussion about feeling more fulfilled receiving PD via Twitter centered around anytime-anywhere-personalized learning. Subject A equated PD on Twitter to what students should receive in the classroom: "I get individualized feedback like teachers are supposed to give to students." Subject B explained further that he/she felt fulfilled with PD via Twitter because "it is ongoing. There are many threads and individuals to follow and good ideas come from all sources. It doesn't just happen on a Friday or Saturday but throughout each and every day." Subject C commented on the fulfillment of PD via Twitter it allows for targeting of "learning to what [they] are interested in and need. [They] can do it on [their own] time, on a need to know or act basis." Subject D's response explained in detail why educators may feel more fulfilled receiving PD via Twitter:

I feel we have more opportunities to interact with one another via Twitter than we can in a meeting. Also, I like being able to go back and see discussions via Twitter to help me to retain what I have learned. I am much more likely to revisit a Twitter discussion to remember my training and ideas than I am to look for the PowerPoint note packet I am handed at a meeting. Twitter provides an opportunity for me to connect the learning back to me and my students and to engage with other educators who may be applying it in the same way.

Participants who felt more fulfilled receiving PD via traditional professional development cited that they enjoy the act of having a face-to-face conversation with others. Participant A explained that "there are times where I think it is important to have face-to-face PD. You learn more from others when you are interacting and doing hands on activities." Participant B's response aligned with Participant A's:

Traditional professional development gives you face-to-face time beyond 140 characters to actually dig deep into a subject and connect with others on a personal level. Traditional professional development makes for more efficient visual and natural communication and conversation.

A selection of subjects indicated that they felt fulfilled receiving Twitter via PD, but provided discussion about why they also felt fulfilled receiving PD traditionally. Subject A explained:

I believe [traditional professional development] is also a viable way to go, and I do attend traditional professional learning. This is especially effective with my peers as we can collaborate and learn from and with one another. This is essentially what is done on Twitter during chats, but the peers are from all over the world. You can an international perspective this way.

Subject B's response further illuminated why educators felt fulfilled receiving PD through both modes:

There is always something to face-to-face professional development and collaboration that should never be left out of expanding a teacher's knowledge. I just hope that as the shift to

making class time more productive for our students, this will result in more productive professional development than the traditional sit and get style.

DISCUSSION

Are educators turning to Twitter to create, use, and manage professional learning networks (PLNs) for professional development? The data collected indicate that educators are creating PLNs, and it is through the use and management of these PLNs that educators are engaging in professional development. Survey responses from 160 educators, all accessed through education related hashtags used specifically to facilitate education related discussion, showed that 94% are actively using Twitter to engage with their PLNs in professional learning. The frequency of the types of posts made on Twitter adds to the body of evidence to support the finding that educators are using Twitter to create, use, and manage PLNs for professional development.

Is online professional development facilitated by Twitter more fulfilling than traditional professional development? The data from the 32 educators in the interview population provided an understanding that educators felt more fulfilled receiving professional development via Twitter, and detailed interview responses further clarified in what ways and why educators felt more fulfilled receiving professional development via Twitter. Twitter provided anytime-anywhere-personalized learning opportunities that met the needs of educators more so than traditional professional development.

The marked difference in frequency between those interactions that happen in an open, global audience (reply, retweet, and tweet) and those interactions that happen in private or semi-private, restricted spaces (mention, direct message, and list) indicate that conversations, learning, and sharing are happening on an open and global scale. The frequency of posting on Twitter indicates that educators are continually seeking out information and interaction, and they are creating content or extending learning conversations. The data indicate that while educators are viewing other types of content, the area of activity that occupies the majority of what they are viewing relates to education and technology. Along with uses of Twitter to share and receive information and resources and maintain and establish a professional learning network, the educators' general uses of Twitter distinctly imply a tendency toward professional capacity.

Professional uses of Twitter imply that educators are actively collaborating and networking with colleagues locally and globally. Educators are also engaging in ongoing professional development through anytime-anywhere-learning opportunities and are participating frequently in asynchronous and synchronous learning opportunities. While the majority of respondents came from the United States, educators across the world responded. Global educators' use of Twitter for professional development is in response to the vast and unlimited reservoir of information, resources, and collaboration available.

Implications

While this study examined the use of Twitter in creating professional learning networks for professional development, the body of information that exists on this subject is limited. Additional research is

needed in the area of Twitter and professional development. Replications of this study are needed where a much larger population of educators are surveyed and interviewed on their uses of Twitter for professional development. Future research could be centered on whether educators are engaging in self-directed professional development; what types of self-directed professional development educators are exploring; what the education-related hashtags on Twitter are that educators use the most for self-directed professional development, and what other modes of social networking educators are using for self-directed professional development.

Future research could also focus specifically on whether Twitter or social networking affects educator morale. Possible research questions could be centered on educators' Twitter as a support network; the types of encouragement educators seek; the connections made through Twitter and whether they have a positive or a negative effect on educator morale; and other modes of social networking that educators use to receive support and encouragement.

Additional research could focus on specific schools that use Twitter as an extension of learning networks and professional development through district created hashtags. Questions for research might be: Are school districts using hashtags to create learning networks among staff at all campuses? Are these district hashtags being used for professional development? How else are district hashtags being used to education related purposes? What type of growth has the district seen in professional development participation, learning exchanges, and staff collaboration? If the district is using hashtags and professional learning is taking place, how is the educator's learning translating to student success?

While not focused on Twitter or social networking, further research should be conducted on educators' needs related to professional development. Probable research questions could explore whether educators are dissatisfied with traditional delivery methods of professional development, and, if so, why they are dissatisfied with traditional delivery methods of professional development. How can professional development become more effective? How can social networking increase the effectiveness of professional development? What blended methods of professional development are most effective? Are these blended methods of professional development using social networking?

Recommendations

The data from this study suggest that educators are currently using, beginning to use, or want to use Twitter to form learning networks for professional development. These findings indicate that the inclusion of education related activity on Twitter within the definition of professional development is warranted. A recommendation for the alteration of traditional professional development is also warranted. The data from the study, specifically the interview responses, indicate the need for professional development that integrates anytime-anywhere-personalized learning and learning networks. It is further recommended that administrators allow educators the opportunity to use Twitter as a viable means for on-campus professional development. The value of Twitter as a professional development sources requires confirmation through more extensive research focusing specifically on the efficacy of the technology.

Additionally, the research results implied a need for training educators on the use of Twitter for professional learning. One recommendation to administrators is to create district hashtags for on-campus professional learning opportunities, making development tracking easier. Specific research into giving time based credit for this type of development verses traditional form is needed.

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