

Effect of Faculty Member's Use of Twitter as Informal Professional Development During a Preservice Teacher Internship

[Michael Mills](#)

University of Central Arkansas

Abstract

Educators have increasingly turned to Twitter as a means for receiving professional development and building and sustaining professional learning communities. This paper reports the results of a study of 82 undergraduate preservice teachers and their attitudes regarding Twitter as a medium for informal professional development support during their internships. Preservice teachers were invited to follow a faculty-mediated Twitter account and subsequently reported their willingness to continue using Twitter after their internships. Data from the end of the internships, as well as a follow-up of those continuing to follow the Twitter account 2 years after their internships, were analyzed for trends in acceptance of Twitter as an informal means of professional development support. Findings show that most preservice interns who followed the faculty-mediated Twitter account were inclined to using Twitter after their internships to learn about new classroom strategies and new technologies.

Increasingly accessible and becoming more ubiquitous, social media outlets have become a prominent means for educators to connect, share, and collaborate with one another (Ebner, Lienhardt, Rohs, & Meyer, 2010; Grosseck & Holotescu, 2008; Rankin, 2009; Schroeder, Minocha, & Schneider, 2010; Veletsianos, 2012). A growing number of teachers, administrators, and students are using social media to form what is often referred to as professional learning networks (PLNs), which help educators expand their professional connections, share resources, and stimulate discussion on a variety of issues, including instructional strategies, classroom management techniques, and educational technology.

Because social media-based PLNs are becoming a pillar of interpersonal connections among educators and providing a means to share professional development resources that support informal learning, this study attempted to examine the value of the popular social media service Twitter as a means of informal professional development by preservice teachers during their internships.

Twitter in Education

According to the Pew Research Center, 67% of all Internet users in the United States and 78% of educators in the United States use some type of social media (Duggan & Brenner, 2013; Purcell, Heaps, Buchanan, & Friedrich, 2013). Twitter is one such social media site and has experienced exponential growth, resulting in nearly 30 million users in the United States alone. Notably, the number of Internet users using Twitter has doubled since 2010, with 241 million active users (Protalinski, 2014). [Twitter](#) is a microblogging social networking service that allows users to communicate with each other with 140-character updates. Twitter users are also able to “retweet” (forward) another user’s updates to their followers. (**Editor’s note:** See website URLs in the [Resources](#) section at the end of this paper.)

Although sometimes viewed as an outlet only for teenagers and celebrities, social media, in general, and Twitter in particular, has been described as a “new participatory culture” that may “represent ideal learning environments” (Jenkins, Purushotma, Weigel, Clinton, & Robison, 2009, p. 10). Junco, Heiberger, and Loken (2011) argued that Twitter’s mobility and immediacy make it “the social networking platform most amenable to public dialogue” (p. 1). Other scholars have noted the value of Twitter as a communication and collaboration tool in education (Corbeil & Corbeil, 2011; Rheingold, 2012).

Some of the benefits of Twitter for educators include the ability to mark conversations and topics with a hashtag (#), allowing users to categorize their tweets for easy searching, restrict the length of users’ updates, and interact with the service virtually anywhere using mobile devices. Educators have also taken interest in so-called tweet chats, whereby participants engage in moderated synchronous conversations organized by a hashtag related to an area of interest (e.g., [#NTchat](#) for new teachers). These features have been instrumental in leveraging Twitter as a popular medium for teachers’ professional development and catalyst for expanding an educator’s professional learning network (Aspden & Thorpe, 2009; Davis, 2011; DeVoe, 2010; Dunlap & Lowenthal, 2009; Fox & Varadarajan, 2011; Grosbeck & Holotescu, 2012; Lu, 2011; Matteson, 2010; Trinkle, 2009; Wright, 2010).

Professional Development

Effective professional development has the potential to impact teachers’ instructional practices and student success positively (Borko, 2004; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007), yet studies have indicated a notable lack of high-quality professional development for educators and no signs of widespread improvement (Hawley & Valli, 2007; Sprinthall, Reiman, & Thies-Sprinthall, 1996; Wei, Darling-Hammond, Andree, Richardson, & Orphanos, 2009).

Loveless (2014) presented a particularly pessimistic outlook for teacher professional development, arguing that there is little research on the efficacy of formal professional development programs and that existing formal professional development programs and coaching are ineffective. He also contended that teachers have mostly improved their practice through informal means, such as informal peer guidance and mentoring.

Similarly, Bauer (2010) described impactful professional development as informal opportunities for collaboration and mentoring that are extended over time (i.e., many months and even years), rather than short-term, one-shot experiences such as one-time workshops.

The use of technology, particularly social media and other Web 2.0 (interactive) technologies, has greatly facilitated the ability of educators to form and maintain professional learning networks in an effort to engage in sustained cooperative learning with other educators. Technology-aided PLNs allow for informal, just-in-time professional development, so educators, particularly those in most need of professional development support, can pose questions, solicit resources, and get advice practically anywhere and anytime. A growing body of research has examined ongoing informal Web 2.0-based professional development, which has shown positive results (Bauer, 2010; Dierking & Fox, 2013; Mills, 2013; Petras, Jamil, & Mohamed, 2012; Walker et al., 2012).

Informal Professional Development Through Twitter

Twitter offers the potential for providing ongoing informal professional development that addresses teachers' specific and immediate needs. The mobility afforded by Twitter creates many more possibilities to learn and share engaging content and reflections than are available through traditional time- and location-fixed professional development meetings, a phenomenon referred to as "time-shifted learning" (Chan & Lee, 2005; Nielsen, 2014).

Wright (2010) and Lu (2011) highlighted the benefits of this flexible access by emphasizing the utility of the medium. Rather than holding onto an insightful perspective or thought, teachers using mobile devices to communicate through texting or social media can instantly share their observation or resource with others. In this respect, teachers using mobile devices can access information more quickly and conveniently than they otherwise would if they used only the desktop computers in their classrooms. Lu (2011) further noted how Twitter specifically can extend conversations and further develop relationships that begin at professional conferences, conversations and relationships that would otherwise end without follow-up.

Thus, a social media-based PLN offers participants the opportunity to engage in dynamic discussions related to changing trends and challenges as they occur. The mobile nature of Twitter helps to keep PLN participants abreast of news and innovations as they happen rather than waiting for a briefing, staff meeting, or yearly professional conference. The asynchronous nature of Twitter-based interactions combined with the availability of synchronous tweet chats give participants enormous flexibility to interact when they are able to, minimizing feelings of professional isolation (Ajayi, 2010; Brown, 2012; Lu, 2011) and obviating the need for face-to-face meetings, which are often challenging to schedule and even more difficult for busy teachers and administrators to attend (Beach, 2012).

Research Questions

The purpose of this study was to identify preservice teachers' attitudes regarding Twitter as an informal professional development tool during their internships. Specifically, the following research questions were addressed:

- Was a preservice Twitter account considered to be a helpful informal professional development tool during an internship?

- What were the perceived professional development benefits of following a Twitter account?
- Would preservice teachers who followed an informal faculty Twitter account during an internship report being more likely to continue following that account even after the internship?
- Would preservice teachers who followed an informal faculty Twitter account during an internship report being more likely to follow a Twitter account of their school or educational cooperative after graduation?
- What other social media services would preservice teachers consider using as an informal professional development tool?

Method

To investigate this topic, I invited 82 undergraduate teacher candidates during their final internship field experience to follow a Twitter account voluntarily that served as an informal supplemental preservice professional development resource, one that shared information and resources on pedagogy, educational technology, job opportunities, and notes of general encouragement. I was not the coordinator for the internship course, but I sent tweets based on findings from readings related to pedagogy and educational technology, as well as informal conversations with interns and in-service teachers regarding what would be useful information to share.

The teacher candidates were asked to complete surveys articulating their social media preferences and reasons for choosing whether or not to follow the Twitter account in the study. An analysis of the findings was conducted to examine preservice teachers' attitudes regarding Twitter as a medium for informal professional development during their internships.

Participants

The participants were undergraduate preservice teacher candidates who were enrolled in an Internship II course, the final requirement for a traditional 4-year undergraduate teacher preparation program at a mid-sized public university in the Southeastern U.S. The participants could volunteer to participate actively in this study by following a Twitter account I established during their internship experience. The remaining preservice teachers served as a comparison group by simply completing a survey reflecting their attitudes toward social media, in general, and Twitter, in particular. Thirty-five of 82 total candidates (42.7%) chose to follow the Twitter account. Eight of the participants were male and 27 were female. Of the non-participants, 7 were male and 38 were female. All candidates were Caucasian. Two students (1 participant and 1 nonparticipant) were removed from the study because they withdrew from the Internship II course.

Data Collection

All participants were asked during the internship orientation meeting to complete a print-based survey at the beginning and end of the study. Data were then manually entered in SurveyMonkey for collection. The data were later transferred to Qualtrics due to the college's termination of services with SurveyMonkey. The data were then imported into SPSS 21 (Mac OS) for analysis. This manual entry method for data collection was chosen because of the lack of Internet accessibility and the limited time with internship students during their orientation and debriefing sessions.

Use of Twitter

A Twitter account was created for the sole purpose of this research study. Privacy controls were set to “protected,” which meant that all tweets I sent were invisible to the general population of Twitter users. Only those users who were identified as interns participating in the study were allowed to follow the account. By following the account, the interns would receive my updates. However, tweets sent by the interns would only be seen by their own followers, which were not necessarily other interns. I did not follow any intern accounts. If an intern wanted all other interns to see an update, then he or she added the specific Twitter study account mention, signified by the symbol (@ and the account name). By doing this, all followers of the Twitter study account who also followed the account of the intern who was tweeting would be able to view the tweet.

During a regularly scheduled orientation session for all internship students at the beginning of the 2012 spring semester, interns received information regarding how to use Twitter, specifically how to sign up and communicate effectively using the service. They were also told that participation in the Twitter study was voluntary. Interns were also asked to complete a survey regarding their attitudes toward social media, in general, and Twitter, in particular.

I sent tweets at various times during the semester-long study using the specific Twitter study account. The tweets ranged in topic from resource links, employment opportunities, messages of encouragement, tips for lesson plan development, and classroom management strategies. Initially, tweets were sent randomly, but 2 weeks after the beginning of the study, the Twitter API-based resource [Tweriod](#) was consulted to determine the best time to send tweets. The best time in this sense refers to when my followers were most likely to access Twitter and the tweets I sent.

The Twitter API-based Chrome Internet browser extension [TweetDeck](#) was then used to schedule the tweets. Notably, the periods of most activity for the interns following the Twitter study account were from 6-7 a.m., 11 a.m.-12 p.m., 3-4 p.m., and 12 a.m.-1 a.m. Study participants following the Twitter study account were not required to post tweets but could if they wanted to share information, solicit advice or resources, or connect with other interns on their own.

I sent 511 tweets during the research study, which spanned 15 weeks of the internship course. The average frequency of tweets per week was 34, with a gradual increase toward the end of the internship period due to an increased number of employment opportunities I communicated to interns. I lowered the frequency of tweets during the week of state-mandated testing.

The tweets were sent based on informal conversations with preservice intern students, local in-service teachers, and findings from readings related to pedagogy and educational technology. At the conclusion of the study, the tweets were coded and separated into eight categories based on emerging themes (see Table 1).

Table 1
Categorization of Posted Tweets

Category	Tweets Sent
Pedagogy/Content Ideas & Resources	151
Employment Opportunities	96
General Information	89
Encouragement/Inspiration	61
Chit-chat	31
Digital Citizenship	28
Classroom Management	16
Profession of Teaching/Networking	6

Privacy Concerns

As the preservice teacher interns were not asked to tweet anything as part of this study, and the tweets that interns may have made on their own were not of interest to this study, there was no tracking of interns' tweets whatsoever. Interns were given instruction on appropriate use of social media and encouraged to consult with the administration at their placement assignments for recommended use of social media. Further, interns were encouraged to set their Twitter accounts to private if they wanted tighter control of who could follow them.

Data Analysis

This study used a quantitative research design to identify participants' attitudes regarding Twitter as an informal means of professional development during their internships. A quantitative approach often employs either experiments or surveys in order to inquire into the research topic (Creswell, 2002), so the quantitative approach was regarded as appropriate for this study.

A Likert-based survey was administered before and after the tweets were sent during the study. Descriptive analyses were used to illustrate the findings in research questions 1 and 2. A Pearson chi-square analysis was used to determine any significance between the preservice teacher interns who followed the informal Twitter account during internship and those who did not for research questions 3-5.

Findings

Was a Twitter Account Helpful?

No respondents indicated that following the account was harmful. Of the reasons given by respondents who chose not to follow the Twitter account as an informal professional development medium, "Forgot or put it off" (40%) and "Don't like Twitter" (40%) were the most common, followed by "Would rather use another social media service" (26.7%) and "Didn't understand Twitter" (20%).

Followers of the Twitter account were asked, “To what extent has Twitter helped you as an informal professional development tool during your internship experience?” Most respondents (91.4%) who followed the Twitter account during the study indicated the account was either “Extremely helpful” (31.4%) or “Somewhat helpful” (60%) as an informal professional development medium, with 8.6% indicating “No opinion/Undecided.” Table 2 shows the level of helpfulness indicated by the preservice Twitter followers.

Table**2**Reported Helpfulness of Following Twitter ($n = 35$)

Response	Male ($n = 8$)	Female ($n = 27$)	Total
Extremely Helpful	3	8	11 (31.4%)
Somewhat Helpful	4	17	21 (60.0%)
No opinion/Undecided	1	2	3 (8.6%)
Somewhat Harmful	0	0	0 (0.0%)
Extremely Harmful	0	0	0 (0.0%)

What Were the Perceived Professional Development Benefits?

Respondents completed a five-item Likert scale on what they considered to be professional development benefits of the Twitter account used in the study. The survey data were grouped into three classes relative to their responses regarding the degree to which the informal Twitter account during their internships accomplished specific professional development outcomes: those who indicated *very much* or *somewhat*, those who indicated *not really* or *not at all*, and those who responded *don't know/no opinion*.

Table 3 reports the professional development benefits reported by respondents. The main benefit that participants identified was learning about resources for the classroom (88.6%), followed closely by learning about new classroom strategies (85.7%), and learning about new technologies (85.7%). Also noteworthy is the percentage of respondents (82.9%) who reported feeling inspired by the Twitter account.

Would Twitter Followers Be More Likely to Continue Following That Account After Their Internship?

Respondents in the study were asked to consider if they would continue following the Twitter account used in the study. Of the participants who followed the preservice Twitter account, 100% indicated they would continue following the account used in the study (85.3% would classify themselves as active users, defined by checking their Twitter status at least once a week). Of those who did not follow the Twitter account during the study, 62% stated they would follow the Twitter study account as in-service teachers, and 64.4% reported they would follow an account sponsored by their local school or educational cooperative (34.1% would classify themselves as active users).

Table 3

Degree to Which Preservice Twitter Accomplished Specific Professional Development Outcomes for Twitter Followers ($n = 35$)

Outcome	Very Much / Somewhat (%)	Not really / Not at All	No Opinion (%)
Get resources for the classroom	31 (88.6%)	1 (2.8%)	3 (8.6%)
Learn about new classroom strategies	30 (85.7%)	1 (2.8%)	4 (11.5%)
Learn about new technologies	30 (85.7%)	1 (2.8%)	4 (11.5%)
Get inspired	29 (82.9%)	1 (2.8%)	5 (14.3%)
Share resources with others	24 (68.6%)	6 (17.1%)	5 (14.3%)
Express accomplishments/successes	20 (57.1%)	6 (17.1%)	9 (25.7%)
Connect with other interns	15 (42.9%)	10 (28.5%)	10 (28.5%)
Express frustrations	8 (22.9%)	16 (45.7%)	11 (31.4%)

A Pearson chi-square was used to determine any statistical significance between those who followed the Twitter account during the study and those who did not follow the account. There was a significant association between following an informal faculty Twitter study account during internship and expectation of continuing to follow that account after the conclusion of the internship experience, $\chi^2 (df = 1) = 33.5, p < .001$. The effect size (Phi) was .647, indicating a strong effect.

To account for outlier bias, an analysis of standardized residuals is in order (Field, 2009). The standardized residuals show significantly more preservice teacher interns who followed the Twitter account than expected indicated they would continue to follow the account after internship ($n = 35, z = 2.6, p < .01$), significantly fewer of those who followed the account than expected noted they would not follow the account after internship ($n = 0, z = -3.5, p < .01$), significantly fewer of those who did not follow the account than expected reported they would follow the account after internship ($n = 17, z = -2.3, p < .05$), and significantly more of those who did not follow the account than expected indicated they would not follow the account after internship ($n = 28, z = 3.1, p < .01$).

I have continued to post professional tweets to the Twitter account used in the study. Two years after the beginning of the study, an attempt was made to contact the followers of the informal Twitter account through direct message, a private tweet seen only to the Twitter user. Twenty-four of the 35 followers of the informal Twitter account used in the original study (68.6%) responded to the survey link sent through direct message. This follow-up revealed that, of the 35 preservice teachers who followed the informal faculty Twitter account during the internship, 32 continued to follow the account (91.4%) and 24 were sustained users (68.6%), defined by those who responded to the request sent through the Twitter direct message function.

Respective to those preservice teacher interns who did not follow the informal faculty Twitter account during internship, it is unclear how many who stated that they would follow the account after graduation actually did. Twitter user accounts can consist of aliases, and Twitter users do not necessarily announce to all other Twitter users any prior

relationships or connections. Since the study surveys were completed anonymously, subsequent Twitter use by non-Twitter users in the study cannot be easily tracked.

Would Preservice Teacher Twitter Followers Be More Likely to Follow a Twitter Account of Their School or Educational Cooperative?

Respondents in the study were asked to consider if they would be interested in following an account sponsored by their local school or educational cooperative after graduation. Of the participants who followed the preservice Twitter account, 100% indicated they would continue following the account used in the study, and 100% of participants stated they would follow a similar account if sponsored by their local school or educational cooperative (85.3% would classify themselves as active users). Of those who did not follow the Twitter account during the study, 62% stated they would follow the Twitter study account as in-service teachers, and 64.4% responded they would follow an account sponsored by their local school or educational cooperative (34.1% would classify themselves as active users).

After cross-tabulating results for those who indicated that they would be likely to follow an official Twitter account of their school or educational cooperative after graduation, a Pearson chi-square was used to determine any statistical significance between those who followed the Twitter account during the study and those who did not follow the account. There was a significant association between following an informal faculty Twitter account and whether or not the preservice teacher would follow an official Twitter account of their school or educational cooperative after graduation, $\chi^2 (df = 1) = 15.56, p < .001$. The effect size (Phi) was .441, indicating a medium effect.

An analysis of the standardized residuals indicated the expected level of those who followed the Twitter account and would also follow an official Twitter account of their school or educational cooperative after graduation ($n = 35, z = 1.3$). Fewer of those who followed the account than expected indicated they would not follow an official Twitter account of their school or educational cooperative after graduation ($n = 0, z = -2.6, p < .01$), fewer of those who did not follow the account than expected reported they would follow an official Twitter account of their school or educational cooperative after graduation ($n = 17, z = -1.2, p < .05$), and more of those who did not follow the account than expected noted they would not follow an official Twitter account of their school or educational cooperative after graduation ($n = 28, z = 2.3, p < .05$).

Of the 24 sustained users two years after the beginning of the study, 1 (46%) indicated that following the Twitter account of their local school or educational co-op, while a majority ($n = 13, 54%$) said they did not.

What Other Social Media Services Would Preservice Teachers Consider Using as an Informal Professional Development Tool?

Although many respondents indicated the primary reasons for not following the Twitter account during the study was because they “forgot or put it off” (40%), an equal percentage reported that the reason was because they “do not like Twitter” (40%). Many respondents (both followers and nonfollowers) expressed interest in other social media services as a part of an official, ongoing informal professional development tool. Several respondents who chose not to follow the Twitter account in the study indicated that they would prefer to use another social media service for professional development (26.7%). Tables 4 and 5 describe which social media services respondents indicated a willingness to use.

After cross-tabulating results for interns' preferences of alternate social media sources as means of professional development, a Pearson chi-square (for expected frequencies >5) and Fisher's Exact Test (for expected frequencies <5) were used to determine any statistical significance between those who followed the Twitter account during the study and those who did not follow the account. The Fisher's Exact Test is warranted when expected frequencies are fewer than 5 for any cell in the 2x2 contingency table (Field, 2009).

Table 4
Internship Preferences for Alternate Social Media Services Used as Professional Development (for Expected Frequencies >5).

Social Media	Participant n = 35	Nonparticipant n = 45	Total n = 80	Two-Tailed p Value (df = 1)
Facebook	30	36	66 (82.5%)	.566
Pinterest	22	24	46 (57.5%)	.495
YouTube	20	21	41 (51.25%)	.377
Google+	6	10	16 (20%)	.779

Table 5
Internship Preferences for Alternate Social Media Services Used as Professional Development (for Expected Frequencies <5).

Social Media	Participant n = 35	Nonparticipant n = 45	Total n = 80	Fisher's Exact Test
LinkedIn	4	4	8 (10%)	.724
Instagram	2	5	7 (8.75%)	.459
StumbleUpon	4	2	9 (7.5%)	1.000
MySpace	0	4	4 (5%)	.127
Flickr	1	0	1 (1.25%)	.329
Reddit	0	2	4 (2.5%)	.502
Foursquare	0	1	1 (1.25%)	1.000
Tumblr	0	1	1 (1.25%)	1.000

There were no significant differences between those who followed the Twitter account during the study and those who did not. However, a large percentage of respondents overall responded that they would prefer to use Facebook (82.5%), Pinterest (82.5%), and YouTube (57.5%) as an alternate means for informal professional development.

Discussion

The literature suggests university students highly value asynchronous collaborative discussion forums (Ajayi, 2010; Ondrejka, 2008) and credit Twitter, specifically, for increasing engagement in their courses (Krutka, 2014; Rinaldo, Tapp, & Laverie, 2011). The findings of this study build upon these earlier findings: Preservice teacher interns who followed an informal faculty Twitter account during their internship were likely to continue following that account even after the internship. This conclusion is further bolstered by the results in the current study in that preservice teachers who followed a Twitter account as an informal professional development medium during internship viewed the experience as helpful, particularly with respect to learning about new classroom resources, classroom strategies, and classroom technologies. Preservice teachers indicated other social media services may be preferred over Twitter. Most of the respondents preferred Facebook (82.5%), Pinterest (82.5%), and YouTube (57.5%).

Limitations

This study is limited by a small, nonrandom sampling of participants in self-selected groups based on their desire to follow the informal Twitter account during internship. Thus, the findings of any reported benefits from the Twitter use must be viewed in context of a preference (or lack thereof) to engage in Twitter during a preservice teacher internship. Noting that, the crux of the analyses in the findings reflect the inherent difference of propensity to use Twitter as an informal professional tool between those preservice interns who chose to use Twitter and those who chose not to. Significantly, the study was limited to a small, nearly homogenous sample, white (100%), mostly female (78.8%) population, which prevents generalizability to other more diverse populations.

Implications

Teacher education programs should make a concerted effort to facilitate informal professional development through Twitter to preservice teachers. As this study indicated a willingness by some preservice teachers to continue following an informal faculty Twitter account even after completing the teacher credentialing program, an opportunity exists for teacher educators to broaden their support to novice teachers who might need additional encouragement and resources as they begin to lead classrooms of their own.

K-12 administrators might also consider integrating Twitter as a supplement to the formalized professional development program. A significant majority of preservice teachers who opted to use the informal Twitter account (91.4%) viewed it as being helpful, particularly with respect to learning more about classroom resources, new classroom strategies, and new technologies. With support, teachers engaged in a school-based Twitter exchange may also contribute what they learn with fellow teachers on site (Forte, Humphreys, & Park, 2012).

Noting the large percentage of preservice interns (40%) who chose not to follow the informal Twitter account during the study because they “do not like Twitter,” teacher

education programs and school districts should also consider other social media outlets (e.g., Facebook) as a supplement to a Twitter feed meant to provide informal professional development. Regardless of the social media service used, school districts are encouraged to experiment with social media to help broaden learning opportunities for their teachers (U.S. Department of Education, 2010).

Further Study

The current research focuses only on Twitter as a one-way vehicle for providing informal professional development resources and guidance to preservice teachers during an internship. Future studies may focus on increased social media interaction among intern peers in addition to a teacher education faculty member. Furthermore, more research needs to be conducted on the difference between informal Twitter accounts delivered by one faculty member and informal Twitter accounts managed by several faculty members or administrators.

These findings have a profound impact for teacher education programs. However, because of the demographic limitations of this study, further research should be conducted in other more diverse teacher education programs, especially those serving minority populations.

Ingersoll and May (2011) described the difficulty of retaining minority teachers and argued that increasing collaboration opportunities could reduce minority teacher turnover rates. As more students, particularly African-Americans and Latinos, rely on social media as a means of communication (Smith, 2013), it is critical that the role of social media be better understood in the context of professional development for these populations.

Considering the groups' self-selected desire to follow a Twitter account during internship, there needs to be more study on the implications of those who do not wish to follow a Twitter account and what other social media they might follow or otherwise use in a professional capacity. Additional studies may focus on alternate social media services as a means to disseminate information and provide informal professional development to preservice educators in an internship program. While respondents indicated Facebook, Pinterest, and YouTube as their top choices, further research should consider the advances of and rapid growth of other social media sites, which were not in existence or fully embraced in the mainstream at the time of this study (e.g., Google+, Instagram, Snapchat, Vine).

Conclusion

Twitter offers a powerful opportunity for teacher educators to connect with and support preservice teachers during their early careers, while also providing preservice educators a tool for connecting with other educators as they face the challenges of their own classrooms. Although some teacher educators and school district administrators might not view Twitter as an authentic means of professional development, there exists an opportunity for at least a conversation regarding what makes informal professional development through social media effective.

An important consequence is that preservice teachers using Twitter as informal professional development support in their internships want that support to extend into their in-service practice. Novice teachers desire professional development that offers immediate, customized support; social media, particularly Twitter, may be one such tool

to address this need (Carpenter & Krutka, 2014). Even if Twitter itself passes out of fashion, it is critical that informal opportunities to connect, learn, and collaborate through social media be encouraged in teacher education and along a teacher's career and professional development trajectory.

References

- Ajayi, L. (2010). How asynchronous discussion boards mediate learning literacy methods courses to enrich alternative-licensed teachers' learning experiences. *Journal of Research on Technology in Education*, 43(1), 1-28.
- Aspden, E. J., & Thorpe, L. (2009). "Where do you learn?" Tweeting to inform learning space development. *Educause Review Online*, 32(1). Retrieved from <http://www.educause.edu/ero/article/where-do-you-learn-tweeting-inform-learning-space-development>
- Bauer, W. (2010). Your personal learning network. *Music Educators Journal*, 97(2), 37-42.
- Beach, R. (2012). Research and policy: Can online learning communities foster professional development? *Language Arts*, 89(4), 256-262.
- Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher*, 33(8), 3-15.
- Brown, E. (2012, January 21). Teachers take to Twitter to improve craft and commiserate. *Washington Post*. Retrieved from http://www.washingtonpost.com/local/education/teachers-take-to-twitter-to-improve-craft-and-commiserate/2012/01/19/gIQAGv8UGQ_story.html
- Carpenter, J., & Krutka, D. (2014). How and why educators use Twitter: A survey of the field. *Journal of Research on Technology in Education*, 46(4), 414-434. doi: 10.1080/15391523.2014.925701
- Chan, A., & Lee, M. J. (2005). An MP3 a day keeps the worries away: Exploring the use of podcasting to address preconceptions and alleviate pre-class anxiety amongst undergraduate information technology students. In D.H.R. Spennemann & L. Burr (Eds.), *Good practice in practice: Proceedings of the Student Experience Conference* (pp.58-70). Wagga Wagga, NSW.
- Corbeil, J. E., & Corbeil, M. E. (2011). Are we ready for mobile learning now? 2007 mobile learning predictions revisited. *Issues in Information Systems*, 12(2), 142-152.
- Cresswell, J. W. (2002). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.
- Davis, M. R. (2011). Social media feeds freewheeling PD. *Education Week*, 513-14.
- DeVoe, K. M. (2010). "You'll never guess who I talked to!": Tweeting at conferences. *The Reference Librarian*, 51(2), 167-170. doi:10.1080/02763870903579877

Dierking, R. C., & Fox, R. F. (2013). Changing the way I teach: Building teacher knowledge, confidence, and autonomy. *Journal of Teacher Education*, 64(2), 129-144.

Duggan, M., & Brenner, J. (2013). *The demographics of social media users-2012*. Retrieved from the Pew Research Center website: <http://pewinternet.org/Reports/2013/Social-media-users.aspx>

Dunlap, J. C., & Lowenthal, P. R. (2009). Tweeting the night away: Using Twitter to enhance social presence. *Journal of Information Systems Education*, 20(2), 129-135.

Ebner, M., Lienhardt, C., Rohs, M., & Meyer, I. (2010). Microblogs in higher education: A chance to facilitate informal and process-oriented learning? *Computers & Education*, 55(1), 92-100. doi:10.1016/j.compedu.2009.12.006

Field, A. P. (2009). *Discovering statistics using SPSS*. Los Angeles, CA: SAGE.

Forte, A., Humphreys, M., & Park, T. (2012). Grassroots professional development: How teachers use Twitter. *Proceedings of the sixth International AAAI Conference on Weblogs and Social Media, Dublin, Ireland* (pp. 106-113). Retrieved from <http://www.aaai.org/ocs/index.php/ICWSM/ICWSM12/paper/view/4585/4973>

Fox, B. I., & Varadarajan, R. (2011). Use of Twitter to encourage interaction in a multi-campus pharmacy management course. *American Journal of Pharmaceutical Education*, 75(5), 88.

Grossecck, G., & Holotescu, C. (2008, April). *Can we use Twitter for educational activities*. Paper presented at the 4th International Scientific Conference, Elearning and Software for Education, Bucharest, Romania.

Grossecck, G., & Holotescu, C. (2012). *Scholarly digital curation in 140 characters*. Paper presented at the International Conference of Applied Social Sciences. Taipei, Taiwan.

Hawley, W. D., & Valli, L. (2007). Design principles for learner-centered professional development. In W. D. Hawley & D. L. Rollie (Eds.), *The keys to effective schools: Educational reform as continuous improvement* (pp. 117-137). Thousand Oaks, CA: Corwin Press.

Ingersoll, R. M., & May, H. (2011). The minority teacher shortage: Fact or fable? *Phi Delta Kappan*, 93(1), 62-65.

Jenkins, H., Purushotma, R., Weigel, M., Clinton, K., & Robison, A. J. (2009). *Confronting the challenges of participatory culture: Media education for the 21st century*. Cambridge, MA: MIT Press.

Junco, R., Heiberger, G., & Loken, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, 27(2), 119-132.

Krutka, D. G. (2014). Social media as a catalyst for convergence culture: Immersing preservice social studies teachers in the social media terrain. In W. B. Russell (Ed.), *Digital social studies* (pp. 271-302). Charlotte, NC: Information Age Publishing.

Loveless, T. (2014). What do we know about professional development? Retrieved from the Brown Center on Education Policy at Brookings website: <http://www.brookings.edu/blogs/brown-center-chalkboard/posts/2014/02/19-teachers-professional-development-loveless>

Lu, A. (2011). Twitter seen evolving into professional-development tool. *Education Week*, 30(36), 20.

Matteson, A. (2010). Tweacher (n): The Twitter enhanced teacher. *School Library Monthly*, 27(1), 22-23.

Mills, M. (2013). Using Twitter to deliver preservice professional development. In R. McBride & M. Searson, Eds.), *Proceedings for Society for Information Technology & Teacher Education International Conference* (Vol. 2013, pp. 800-801). Chesapeake, VA: Association for the Advancement of Computing in Education.

Nielsen. (2014). How smartphones are changing consumers' daily routines around the globe. *Nielsen Newswire*. Retrieved from <http://www.nielsen.com/us/en/newswire/2014/how-smartphones-are-changing-consumers-daily-routines-around-the-globe.html>

Ondrejka, C. (2008). Education unleashed: Participatory culture, education, and innovation in second life. In K. Salen (Ed.), *The ecology of games: Connecting youth, games, and learning* (pp. 229-252). Cambridge, MA: The MIT Press. doi:10.1162/dmal.9780262693646.229

Petras, Y., Jamil, H., & Mohamed, A. R. (2012). How do teachers learn? A study on the policy and practice of teacher professional development in Malaysia. *KEDI Journal of Educational Policy*, 9(1), 51-70.

Protalinski, E. (2014). Twitter passes 241m monthly active users, 184m mobile users, and sees 75% of advertising revenue from mobile. *The Next Web*. Retrieved from <http://thenextweb.com/twitter/2014/02/05/twitter-passes-million-monthly-active-users-x-million-mobile-users/#!vS3fI>

Purcell, K., Heaps, A., Buchanan, J., & Friedrich, L. (2013). *How teachers are using technology at home and in their classrooms*. Retrieved from the Pew Research Center website: http://www.pewinternet.org/~media/Files/Reports/2013/PIP_TeachersandTechnologywithmethodology_PDF.pdf

Rankin, M. (2009). Some general comments on the Twitter experiment. *El Recuperado*, 10. Retrieved from <http://www.utdallas.edu/~mrankin/usweb/twitterconclusions.htm>

Rheingold, H. (2012). *Net smart: How to thrive online*. Cambridge, MA: MIT Press.

Rinaldo, S. B., Tapp, S., & Laverie, D. A. (2011). Learning by tweeting: Using Twitter as a pedagogical tool. *Journal of Marketing Education*, 33(2), 194-204.

Schroeder, A., Minocha, S., & Schneider, C. (2010). The strengths, weaknesses, opportunities and threats of using social software in higher and further education teaching and learning. *Journal of Computer Assisted Learning*, 26(3), 159-174. doi:10.1111/j.1365-2729.2010.00347.x

Smith, A. (2013). *African-Americans and technology use*. Retrieved from the Pew Research Center website: <http://pewinternet.org/Reports/2014/African-American-Tech-Use.aspx>

Sprinthall, N. A., Reiman, A. J., & Thies-Sprinthall, L. (1996). Teacher professional development. In J. P. Sikula, T. J. Buttery, & E. Guyton (Eds.), *Handbook of research on teacher education* (2nd ed., pp. 666-703). New York, NY: Macmillan.

Trinkle, C. (2009). Twitter as a professional learning community. *School Library Monthly*, 26(4), 22-23.

U.S. Department of Education. (2010). *National education technology plan 2010*. Retrieved from <http://www.ed.gov/sites/default/files/netp2010.pdf>

Veletsianos, G. (2012). Higher education scholars' participation and practices on Twitter. *Journal of Computer Assisted Learning*, 28(4), 336-349.

Walker, A., Recker, M., Ye, L., Robertshaw, M. B., Sellers, L., & Leary, H. (2012). Comparing technology-related teacher professional development designs: A multilevel study of teacher and student impacts. *Educational Technology Research and Development*, 60(3), 421-444. doi:10.1007/s11423-012-9243-8

Wei, R. C., Darling-Hammond, L., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the U.S. & abroad* (Technical report). Oxford, OH: Learning Forward; Stanford, CA: Stanford Center for Opportunity Policy in Education.

Wright, N. (2010). Twittering in teacher education: Reflecting on practicum experiences. *Open Learning*, 25(3), 259-265. doi:10.1080/02680513.2010.512102

Yoon, K. S., Duncan, T., Lee, S. W. Y., Scarloss, B., & Shapley, K. (2007). *Reviewing the evidence on how teacher professional development affects student achievement* (Issues & Answers Report, REL 2007-No. 033). Retrieved from the Southwest Regional Educational Laboratory website: http://ies.ed.gov/ncee/edlabs/regions/southwest/pdf/rel_2007033.pdf

Resources

#NTchat for new teachers - <https://twitter.com/hashtag/ntchat>

TweetDeck - <https://tweetdeck.twitter.com>

Tweriod - <http://www.tweriod.com/>

Twitter - <http://twitter.com>

Author Notes

Michael Mills
University of Central Arkansas
Email: mmills@uca.edu
Twitter: @MichaelSMills

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