The Career You Save May Be Your Own: Exploring the mathtwitterblogosphere as a Community of Practice

Conference Paper · March 2018

2 authors:

K Bret Staudt Willet
Florida State University
24 PUBLICATIONS   510 CITATIONS

SEE PROFILE

Paul N Reimer
Michigan State University
8 PUBLICATIONS   9 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:

Play and Playfulness View project

Exploring State Educational Twitter Hashtags View project

The Career You Save May Be Your Own: Exploring the *mathtwitterblogosphere* as a Community of Practice

K. Bret Staudt Willet
Paul N. Reimer

Michigan State University
United States

staudtwi@msu.edu
reimerp1@msu.edu

Abstract: Teachers face numerous challenges: feeling isolated in their classrooms, overwhelmed by the demands of the job, and disappointed in traditional professional development. Prior research has pointed to Twitter as a possible solution to these challenges, so we examined teacher participation in the hashtag space #MTBoS (the *mathtwitterblogosphere*). We sought to answer: Do teachers' contributions to #MTBoS demonstrate the characteristics of participation in a community of practice (CoP)? To answer, we collected 6,985 unique tweets tagged with #MTBoS. We qualitatively coded a sample of 100 original posts to analyze the quality of content as related to four characteristics of a *community of practice* (CoP): (a) domain of knowledge, (b) community of people, (c) shared practice, and (d) discipline of convening. In this initial exploration, we found that there is evidence of #MTBoS functioning as a CoP and further research is warranted.

Introduction

Novice teachers share a multitude of challenges: managing content area expectations for their classes, finding their place in the social and cultural context of schools, developing their own sense of professional identity, and accessing resources that veteran teachers may be using—all while trying to gain a sense of how their teaching practice might align with their own visions of good teaching (Horn, Nolen, Ward, & Campbell, 2008). Even under best circumstances, the beginning of a teaching career is stressful as novice teachers feel overwhelmed with guiding discussions, helping students, and navigating the tension between teaching ideals and implementation (Lewis, 2014).

The NCTM's *Principles to Actions* (2014) named professional isolation as an obstacle on the path toward teacher growth. This isolation can result from a culture of autonomy within the teaching profession or from limited opportunities to collaborate with colleagues. In response, *Principles to Actions* called for a change toward "collective professional growth" and an "abiding sense of interdependence and collective responsibility" (p. 99).

Collective growth via professional development (PD) does not always occur as planned via the workshops offered by a school district; success depends on the topics groups discuss and the intellectual work in which they engage (Kennedy, 2016). PD for teachers has provided only partial responses to teaching challenges due to sporadic initiatives that do not take into account the situated nature of teaching and learning (Fishman, Davis, & Chan, 2014). Carpenter and Krutka (2014) found that teachers perceived district-provided PD to be generic, impersonal, and unproductive. Finally, many PD initiatives have not helped teachers to collaboratively consider ways to improve their practices (Fishman et al. 2014); as a result, novice teachers often face teaching challenges in isolation.

Background on Twitter

Twitter is a microblogging platform that allows participants to share brief posts of 140 characters or less, called *tweets*. The high frequency of interaction among Twitter participants—which is personalized, immediate, and beyond the limitations of geography (Carpenter & Krutka, 2014)—combined with the ease of joining makes Twitter an attractive space for teachers seeking to connect with colleagues (Visser, Evering, & Barrett, 2014). Teachers are

able to connect for the sake of receiving emotional support, overcoming isolation, seeking advice, or accessing new knowledge (Trust & Horrocks, 2017).

#MTBoS is both a Twitter conversation thread and a hashtag space for mathematics teachers to engage with each other about their teaching experiences. Simply by adding the text #MTBoS to a tweet, a participant is able to insert and index a post into a *hashtag stream*—a continually updating collection of tweets tagged with the same text by Twitter users. See Figure 1 for one exemplary tweet conversation in #MTBoS; in this example, teachers are self-organizing a professional learning community.

One conceptualization of contributing to a Twitter hashtag stream is as participation in a *community of practice* (CoP; Britt & Paulus, 2016), a framework for thinking about collective participation and the development of shared knowledge and practices (Wenger, 1998). Members of CoPs find value in sharing what they have learned as they collaborate to develop a clearer picture of their common practice (Wenger, McDermott, & Snyder, 2002).
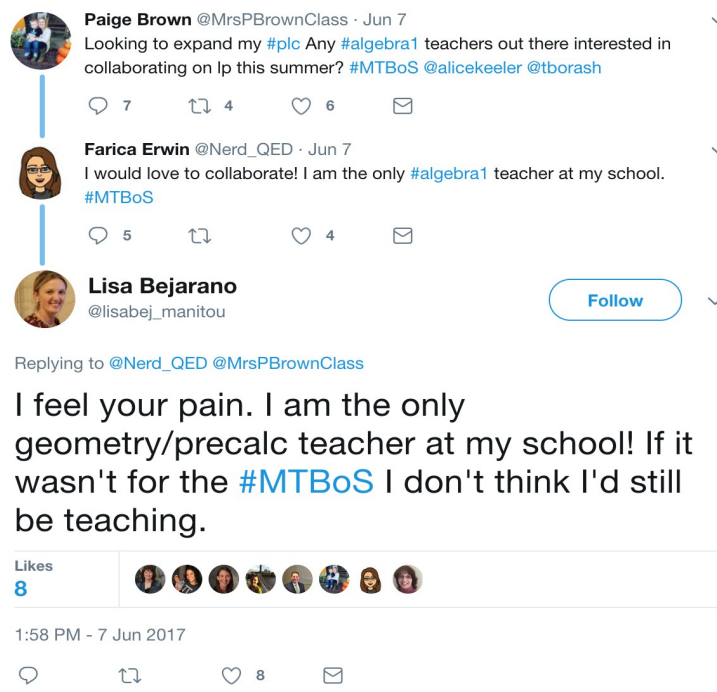

Figure 1. Tweet Demonstrating a Typical Social Interaction in #MTBOS

Purpose and Research Questions

The purpose of this study was to explore how teachers participated in one Twitter educational hashtag space, the *mathtwitterblogosphere* (#MTBoS). We were guided by a primary research question:

- **RQ1.** Do teachers' contributions to #MTBoS demonstrate the characteristics of participation in a community of practice (CoP)?

Following this primary research question, we asked two secondary research questions to further explore the nature of #MTBoS as a potential CoP:

- **RQ2.** Does teacher participation in #MTBoS help combat feelings of professional isolation?
- **RQ3.** Does teacher participation in #MTBoS help problem solve issues encountered in classroom practice?

Method

Using a Twitter Archiving Google Sheet (Hawksey, 2014), we collected 7,454 tweets tagged with #MTBoS posted between May 11–June 11, 2017. We then used the R programming language (R Core Team, 2017) to clean

the data by removing duplicate tweets, resulting in a dataset of 6,985 unique tweets from 2,828 different contributors over the course of this one-month period.

We also used R to categorize the tweets into ten different types of contributions; to answer RQ1, we considered the proportion of tweet types as determined by our machine coding with R. Of these ten types of contribution, we were especially interested in those that seemed like they would be the most likely to demonstrate the social and interactive nature of a CoP:

- *replies* (i.e., responses to other Twitter users),
- *directed posts* (i.e., tweets beginning with someone's username, a convention signaling a message that is public but intended specifically for that other user),
- tweets saying "thanks," and
- *original posts* (i.e., tweets posted independently, not in response to another tweet and not containing the text markers of retweets, modified tweets, or tweets saying "thanks").

We also performed a series of keyword searches of terms related to different aspects of communities of practice—searching for tweets that would demonstrate characteristics of CoPs.

To answer RQ2 and RQ3, we needed to a more precise and focused look at the tweets themselves, so we focused on original posts (*n* = 2,547), which constituted 36.5% of the tweets in our dataset. As an initial exploration, we conducted human-coded content analysis on a simple random sample of 100 original posts.

Results and Discussion

Because a community of practice is a social endeavor, we looked at the proportions of the four types of tweets most likely to be social, finding that full #MTBoS dataset was composed of 36.5% original posts, 3.7% replies, 1.3% directed posts, and 0.3% tweets saying "thanks." In other words, the type of tweet alone did not tell us much about #MTBoS as a CoP; the exception being original posts. However, original posts could serve a variety of functions—including spam to the hashtag—so their larger proportion did not necessarily provide evidence of CoP characteristics.

Therefore we searched the dataset for keywords related to communities of practice. A CoP is defined by four broad characteristics: (a) a specific domain of knowledge, (b) a connected community of people, (c) a shared professional practice, and (d) a discipline of convening (Wenger, 2010; Wenger et al., 2002)—searching for related terms, we did indeed find tweets that demonstrated each of these characteristics.

The #MTBoS Domain of Knowledge

The *domain of knowledge* defines the topic for the CoP and identifies the set of issues to be addressed (Wenger et al., 2002). The domain establishes flexible boundaries for participation as well as a community identity focused around specific issues of interest; this narrowing of the conversation is especially important when the CoP gathers via a medium such as Twitter, which offers a torrent of information and conversations but little inherent structure. By focusing the conversation, the domain clearly demonstrates what is important to the CoP. The evolving questions, learning, and knowledge that are developed within the CoP are guided by a commitment to a relevant and purposeful domain. Through the initial coding of our tweet corpus, we found evidence of several different Twitter conversations that demonstrated themes of the #MTBOS domain of knowledge: shaping identity of the CoP (e.g., explaining what participation in the #MTBoS community means), inspiring contributions from participants (e.g., offering support for starting teaching-related blogs), and exploring problems of practice and collectively discussing common challenges (e.g., finding a starting point for mastery learning in Algebra 1 and 2).

The #MTBoS Community of People

The *community of people* is composed of those who care about and gather around a particular domain of knowledge (Wenger et al., 2002). As members share ideas, ask questions, and listen to each other, a trust develops that ensures members' contributions will be welcomed and valued. Twitter has been shown to help teachers connect meaningfully with peers in a participatory culture (Visser et al., 2014), sustain mutual relationships (Britt & Paulus,

2016), and receive emotional support (Carpenter & Krutka, 2014). Through the initial coding of our tweet corpus, we found evidence of several different Twitter conversations that demonstrated themes of the #MTBOS community of people: intentional efforts to invite newcomers to join the group and get involved (e.g., "If you're reading this and work in math ed you're welcome to 'join' our community. All it takes is adding #MTBoS to your bio!"), helping participants connect within the network and deepen contact points (e.g., "Soon we'll be spotlighting #MTBoS members randomly chosen from the directory. If you haven't added/updated now's a good time!"), and sharing and celebrating after the completion of a teaching milestone (e.g., someone posted, "I just finished with my first year teaching, couldn't have done it without #MTBoS Thanks everyone!" to which another participant replied, "Congrats on your first year! Take time to recharge and welcome to #MTBoS").

The #MTBoS Shared Practices

A *shared practice* is the collective product that the CoP develops and maintains. Teachers freely discuss ideas, share resources, and work together on projects—leading to the creation of knowledge products such as documents and tools (Wenger et al., 2002). Although problems of practice are highly contextual, local PD is not always available or effective. As an alternative, an online CoP can be helpful in allowing teachers to explore solutions with colleagues, identifying common approaches that work across different contexts. This collective knowledge allows teachers to experiment with variations and ultimately to find unique approaches for their own classrooms (Visser et al., 2014). Through the initial coding of our tweet corpus, we found evidence of several different Twitter conversations that demonstrated themes of the #MTBOS shared practices: reaching out for support by asking others to share and discuss teaching practices (e.g., "What does your first communication with parents and students look like to being a school year? Do you reach out before the first day?"), contributing resources to colleagues (e.g., linking to education-related websites and blogs), and demonstrating specific teaching practices (e.g., prompts to start classroom conversations).

The #MTBoS Discipline of Convening

The *discipline of convening* is the deliberate work to ensure the community of practice is a learning space, a site of productive inquiry (Wenger, 2010). Although an online meeting space offers the convenience of expanding the scope of conversations as well as perpetual access, convening is challenging because everyone wants to participate in different ways. Some are motivated by creating, contributing the original tweets of #MTBoS; others are motivated by multiplying the scope of the conversation (e.g., retweeting and replying to tweets).

Through the initial coding of our dataset, we found evidence of several different Twitter conversations that demonstrated themes of the #MTBOS discipline of convening: participants acting as informal conveners (e.g., "Let's make our community better! Welcome newbies and help them stay around so they can grow with us! Newbies – we love to meet you!"), supporting productive inquiry that shapes teaching practice (e.g., as evidenced in "As the school year ends, sincerest thanks to #MTBoS community for the influence, advice, and honest/vulnerable reflection that's shaped my own practice."), and creating opportunities for dialogue (e.g., "Help please, #MTBoS peeps. What chats do you participate in and how do you keep track of when they are happening?").

Quality of #MTBoS Content

Beyond finding trace evidence of each of the four characteristics of communities of practice, we wanted to know more about the quality of contributions to #MTBoS. Related to the domain of knowledge, do people actually know what #MTBoS means? We found that 57% of the original posts in our sample made explicit mention of math, so there is a good chance that even a casual observer of #MTBoS would realize it is a math-related conversation, even if the hashtag itself is ambiguous. We also found that 35% of our sample tweets were characterized by a social tone such as saying thanks and sharing personal information—markers of a community of people. We found that 61% of the sample tweets offered resources related to or examples of classroom practices. Although unlike many other educational Twitter hashtags, #MTBoS does not offer a weekly synchronous chat, 25% of the sample tweets made invitations to respond in some way, such as joining an event, answering a questions, or providing feedback on a resource. These are not precise examples of the discipline of convening, but they do provide evidence that #MTBoS participants contribute with regular and normal expectations of reciprocity. These observations from our

limited initial round of content analysis suggest that there is activity and behavior in #MTBoS worth further investigation.

Conclusion

Implications for Teachers

Many teachers—as evidenced by the comments of those joining online communities (Carpenter & Krutka, 2014)—have experienced a lack of community and disappointment with PD, especially during (but not limited to) the transition from preservice to first teaching assignment. Although teachers are often willing to reach out to new colleagues at their school sites, both physical and programmatic barriers persist that create a sense of isolation and individuation for teachers (NCTM, 2014). As we have begun to show through this brief case study, teachers are able to address professional challenges by participating in an online community such as #MTBoS on Twitter. In this particular space, opportunities exist for mathematics teachers to identify with a group of fellow teachers who are committed to high-quality, reflective mathematics teaching. Relationships with colleagues in similar teaching situations or contexts can be forged, developing a sense of community and belongingness. Teachers contribute to shared practices through understanding together what works in mathematics teaching and learning. Finally, communities like #MTBoS can serve as a space for ongoing inquiry and reflection; this sentiment is succinctly expressed by the conversation in Figure 2: "Twitter PD is there for taking!"
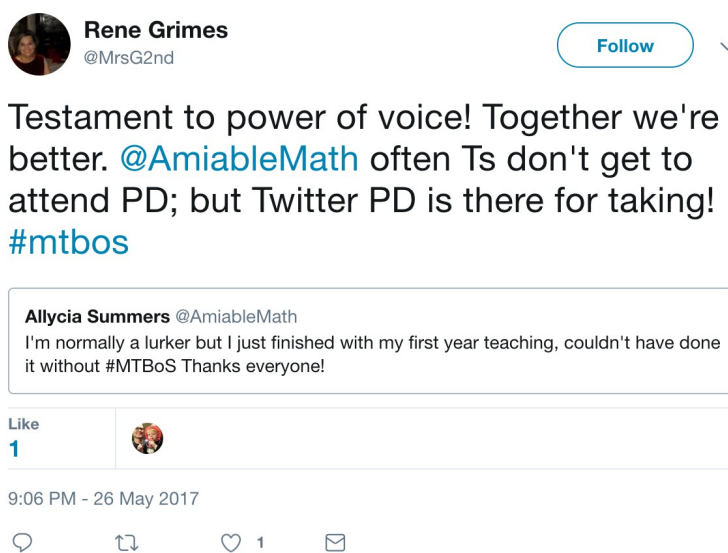

Figure 2. Tweet Conversation Validating the Growth Possible in Twitter Communities

As teachers grow throughout their careers, much of their work centers on developing the knowledge needed for teaching and learning—but this should not be considered isolated head-knowledge. Instead, as Wenger et al. (2002) described, "Knowledge involves the head, the heart, and the hand; inquiry, interactions, and craft. Like a community, it involves identity, relationships, and competence; meaningfulness, belonging, and action. A CoP matches that complexity" (p. 45). An initial study of #MTBoS seems to offer this complexity; more research is needed to identify other online networks—especially Twitter hashtag spaces—that can serve as communities of meaningfulness, belonging, and action.

Future Research

This research is an initial, exploratory case study of #MTBoS, and although we found teachers expressing positive sentiments related to their experience of participation in the hashtag space, more work is needed to determine the significance of the preliminary findings described here. RQ2 and RQ3 require further study to answer in full—to what extent are teachers overcoming professional isolation and solving problems related to classroom practice because of #MTBoS? A more extensive content analysis—sampling from each type of tweet contribution to #MTBoS—is required. Additionally, interviewing #MTBoS participants would greatly enrich our understanding of the benefits of participation. We plan to further explore this space in the months to come.

References

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

Carpenter, J. P., & Krutka, D. G. (2014). How and why educators use Twitter: A survey of the field. *Journal of Research on Technology in Education*, *46*, 414–434. doi:10.1080/15391523.2014.925701

Fishman, B. J., Davis, E. A., & Chan, C. K. K. (2014). A learning sciences perspective on teacher learning research. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 707-725). Cambridge: Cambridge University Press.

Hawksey, M. (2014). TAGS: Twitter Archiving Google Sheet (Version 6.1) [Computer software]. Retrieved from http://tags.hawksey.info

Horn, I. S., Nolen, S. B., Ward, C., & Campbell, S. S. (2008). Developing practices in multiple worlds: The role of identity in learning to teach. *Teacher Education Quarterly, 35*(3), 61-72. Retrieved from http://www.jstor.org/stable/23478981

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

Lewis, G. M. (2014). Implementing a reform-oriented pedagogy: Challenges for novice secondary mathematics teachers. *Mathematics Education Research Journal, 26*, 399-419. doi:10.1007/s13394-013-0092-5

National Council of Teachers of Mathematics. (2014). Principles to actions: Ensuring mathematical success for all. Reston, VA: NCTM.

R Core Team. (2017). R: A language and environment for statistical computing (Version 3.4.3) [Computer software]. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from https://www.R-project.org/

Trust, T, & Horrocks, B. (2017). "I never feel alone in my classroom": Teacher professional growth within a blended community of practice. *Professional Development in Education, 43*: 645–665. doi:10.1080/19415257.2016.1233507

Visser, R. D., Evering, L. C., & Barrett, D. E. (2014). #TwitterforTeachers: The implications of Twitter as a self-directed professional development tool for K-12 teachers. *Journal of Research on Technology in Education*, *46*, 396–413. doi:10.1080/15391523.2014.925694

Wenger, E., McDermott, R. A., & Snyder, W. (2002). *Cultivating communities of practice: A guide to managing knowledge*. Harvard Business Press.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge University Press.

Wenger, E. (2010). Communities of practice and social learning systems: The career of a concept. In C. Blackmore (Ed.), *Social learning systems and communities of practice* (pp. 179-198). London: Springer London. doi:10.1007/978-1-84996-133-2

Acknowledgements