Constructing Online Communities of Practice

Marvin Cohen, Babette Moeller & Michelle Cerrone

In an age of standards-based educational reforms that require fundamental changes in instruction, Communities of Practice (CoPs) have garnered considerable attention as a complement to formal professional development experiences. Wenger (2013) defines CoPs as “groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.” According to Wenger (2013), CoPs have three key features in common:

1. They have a shared domain of interest. Membership in the community implies a commitment to the domain and a shared competence in it.
2. Members in the community interact and learn together. They engage in joint activities and discussions, help each other, and exchange information.
3. Participants in a CoP are practitioners, and through sustained participation in the community they develop a shared repertoire of resources or practice.

Research on effective professional development highlights the importance of collaborative and collegial learning environments and CoPs in schools (Darling-Hammond & McLaughlin, 1995; Knapp, 2003). They are recognized as a way to develop and sustain teachers’ individual and collective capacity (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006). Productive CoPs allow teachers to work together on instructional planning, learn from each other through mentoring or peer coaching, conduct research on the outcomes of classroom practices, and collectively guide curriculum, assessment, and professional learning decisions (Wei et al., 2009). A growing body of research has begun to document the positive impact of CoPs on teacher knowledge, attitudes, and practice, as well as student achievement (Carroll, Fulton, & Doerr, 2010; Fulton, Doerr, & Britton, 2010; Saunders, Goldenberg, & Gallimore, 2009; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006; Vescio, Ross, & Adams, 2008).

While emerging technology and social media offer significant promise to support the kind of collaborative and teacher-directed ongoing professional development that research has shown to be effective, and extend it across time and geographic distances, little is known about how to effectively employ these tools to develop and support ongoing online CoPs. With funding from the Booth Ferris Foundation, Bank Street College has initiated a two-year investigation into how social media can be employed to create sustainable online CoPs that are consistent with Bank Street’s commitment to progressive pedagogy and constructivist learning. This project offers the opportunity for the creation of experimental online CoPs and their iterative refinement through research and practice.

Our work is guided by the following questions:
• How does an online CoP evolve?
• What types of resources, practices, and experiences do participants in an online CoP share?
• How do participants interact in an online CoP?
• What is the impact of participation in an online CoP on teachers’ repertoire of practice?
• What is the role of facilitation in an online CoP?

In this paper, we do the following: 1) share emergent findings gathered through the development and implementation of an online community of practice (Math with Your PJs On) for Bank Street alumni who teach math, as well as other progressive educators; 2) describe findings from a focus group conducted with a sample of participants; and 3) discuss the next steps we will take in our investigations based on lessons learned through research and practice.

Getting Started: Doing Math Together

Math with Your PJs On (PJs) is a free online CoP hosted by Bank Street College of Education in an effort to provide a forum for alums and other progressive educators trying to meet the challenge of implementing the Common Core State Standards in Mathematics (CCSSM). Graduates of Bank Street’s Math Leadership Program (MLP) in particular had expressed concern about the challenges of implementing the CCSSM in the context of progressive pedagogy. PJs was also a response to the expressed desire of Bank Street College alums to stay connected to the College professionally. They wanted to be engaged in professional conversations and have access to colleagues and faculty to discuss what was going on in their classrooms, as well as what was happening in the field of education.

The PJs online CoP was started in February 2014 as a public community requiring an invitation from a MLP Faculty member who facilitated the discussion. In order to be invited into the community, participants needed to respond to an alumni email blast and fill out a short needs assessment. Other progressive educators could join if they came upon the site or were invited by an alum. New members were asked to briefly introduce themselves to the group.

The goal for establishing the PJs online CoP was to engage participants in discussing and doing mathematics in a way that could inform their practice by helping them maintain their progressive stance while implementing Common Core State Standards-based mathematics.

Initially there were about 15 participants. The group mostly consisted of local alums from the NYC area who worked in diverse settings, including a public school in the South Bronx, and private schools such as Bank Street’s School for Children. The group also included an alum teaching in England, and two MLP faculty members. Participants worked with various grade levels, ranging from first to ninth grade. Community exchanges were conducted using the Google community platform.

During the first year, participation in the PJs CoP fell into two categories. The first was doing math together and the second was sharing resources. For the facilitator, doing math together was critical; interest in mathematics was what tied the CoP together.
Figure 1. Sample Discussion of a Math Problem in the CoP
Figure 2. Bar Model Solution
During the first week the facilitator posted the problem below, and the PJtoGoCoP quickly began doing math:

Math Problem Week 1 (36 Children): There are 36 children in the class. There are 8 more boys than girls. How many boys and girls are there? How many ways can you resolve it?

Figure 1 illustrates the discussion that ensued. Discussion of strategies for solving the problem quickly became a springboard for exchanging ideas for how to work on this type of problem with children at different ages, including how to model and represent it.

By posting the “36 children” problem, the facilitator generated a flurry of activity and discussion that was interesting and relevant, and could be brought to the classroom quickly. It was a task that could be adapted across the grades and had many possible solution strategies, some of which were surprising to the others. The discussion provided a place for people to do math themselves and to learn about pedagogy, two areas they were interested in. They were also invited to think about how they might present the problem to their math classes (Grades 1-9). Participants focused on various aspects of the problem. Some focused on the pedagogy (the array model above and the bar model below); others began to better understand the content and algebraic thinking (see February 18 and 19 postings in Figure 1).
From the discussion above we get a glimpse of teachers who feel that they have figured out the solution and understand the problem, but do not see the algebraic thinking that is implied by the February 11 posting. It is in this exchange that new mathematical understanding begins to be constructed. All posted solutions were correct. Participants knew that their solutions worked and made sense. By seeing the work of peers in the field that looked so different they were forced into a disequilibrium that connected their intuitive thinking to algebraic thinking (i.e., the generalization of the arithmetic involved), described in the presentation shown in Figure 3.

When this problem was posted, the PJs CoP had approximately 40 participants. About ten of them participated in the discussion. One of the challenges and frustrations for the facilitator was determining if the other 30 participants were also engaged. Were they listening? Were they thinking about the math and/or the pedagogy? The facilitator could not walk over and look at their work.

Those who were reading and not posting were asked to was determining if the other 30 participants were also engaged. Were they listening? Were they, informal feedback suggested that participants only occasionally used this tool. There was no reliable way to tell if people were reading and not commenting. In hindsight, the facilitator sees that although he had posed a mathematical problem that lent itself to collaboration and constructivist thinking, he had not considered the tool the CoP was using, which lent itself to mostly linear conversations. He could have asked groups of two to four participants to set up small-group discussions in “virtual breakout rooms” and then go back and share with the larger group. The facilitator accepted the tool in its most obvious form rather than challenging it to support a different kind of learning. He likens it to walking into a classroom with desks in rows and not rearranging the furniture.

Growing & Maintaining the PJs Online Community

The original plan was to begin PJs in February and to support it for only twelve weeks. The inconsistent participation and membership growth led the facilitator to maintain the community, and it is still active. After the activity around the “36 children” problem, membership grew with a range of activities. Participants posted articles and shared problems. The group continued to be committed to constructivist learning, which was seen in their interest in solving problems themselves rather than being told answers. This evolved into participants seeking articles and pedagogy that addressed the challenges they were facing, and wanting to discuss these challenges with each other. Overwhelmingly, the comments and responses were brief and appreciative of a new resource.

Yet there was little dialogue among participants. Gallagher’s (2006) metaphor of a conversational volley occurred on occasion, but came with the direction of the facilitator. Even as membership in the community grew, the level and style of activity did not increase substantially and remained inconsistent. One conversation that seemed to have legs of its own was prompted by a technology teacher who was interested in use of the whiteboard (see Figure 4).

This conversation continued with one other teacher joining the conversation.
A range of interests seemed to invite comment. Others returned to PJs to share a lesson or a reading. Some participants did not contribute for a while, and then suddenly reappeared, wanting to agree or make a particular point, and showing that they were following the online conversation all along.

At another point, someone new to the CoP made a posting about “cute” girls and math that others who had been reading but not posting found to be sexist. There was a quick response from others that indicated that there were people reading but not participating in the dialogue.

For the facilitator this rhythm, albeit slow, has held his interest and gotten him to keep the site alive. After about 20 months the community has steadily grown and there are now about 240 members. There are three to ten members of the community who seem to keep the site alive, although some participants return after months of not posting. Activity often peaks on weekends. Usually a member posts a reading or responds to something the facilitator posts. They seem to have been following discussions, but not posting. Yet when they join the site they seem to do it with interest and enthusiasm, as illustrated by the postings shown in Figures 5 and 6. Both participants in the posts had not posted for several weeks, and were responding to an article about the parental pressure for children to know certain procedures by rote.
To better understand the experience of PJ participants, Bank Street collaborated with researchers from the Center for Children and Technology (CCT) of the Education Development Center (EDC), a non-for-profit educational research, development, and evaluation organization. EDC/CCT conducted a focus group with four members of the PJs CoP. At the time of the focus group, Math with Your PJs On had been running about five months.

The purpose of the focus group was to better understand participants’ experiences and to collect feedback that would inform future CoPs at Bank Street. The focus group participants had a range of professional roles. One participant taught eighth-grade mathematics; two had supervisory roles at their schools; and one was a former teacher currently in Bank Street’s math leadership program. Although three of the four participants had participated in or led an online course, only one had been part of an online CoP.

The focus group participants reported two main goals for joining PJs: 1) to connect with like-minded teachers and supervisors; and 2) to explore the potential of online communities that do not have built-in accountability mechanisms (i.e., grades). The reported level and type of participation among the four participants varied, though they all commented that their participation decreased over time. Participants said they were most active in PJs when it first started, and noted that they participated mostly as readers. Three of four participants said that when the community first started, they posted a few comments or solutions to math problems posed by the facilitator, but more recently found time to be a barrier to their participation. The other participant said she mostly read others’ posts, but did not post anything herself. She attributed her lack of active participation to problems she was having with her own technology. Like the others, she reported that her engagement in the community decreased over time. Overall, the experience of the four focus group participants reflected the participation habits of the larger group.
The focus group was conducted synchronously online, using Google hangout, and audio-recorded. Interview questions probed for participants’ experience with the PJs online CoP and their suggestions for future CoPs. To analyze the data, we transcribed the recording and analyzed the transcript thematically. Key findings from the focus group are detailed below.

**Focus Group Results**

**Participants had access to resources directly applicable to their teaching needs.**

Educators place great value on resources related to the content in their curriculum and that can be easily incorporated into their classrooms and the classrooms of the teachers they lead. The participants expressed appreciation for the resources and ideas they gained through PJs. According to one participant, “I love all the posts when people are like, ‘Oh, I did this and this looked cool and that was neat.’ All those things were fantastic and I think it’s very helpful in that way.” Another liked that she could bring the resources into her teaching “the next day.” This teacher also said she shared some of the resources with her colleagues. Examples of resource sharing are displayed in Figures 7 and 8 below.

![Figure 7. Resource Sharing: Pinterest Board](image-url)
Participants felt most connected to the community’s facilitator, and noted his presence as one of the main strengths of the community.

Participants were particularly impressed with the facilitator, who they said nurtured a safe environment and was active without being overbearing. They commented that the guidelines he set for the first few posts helped establish respect for all participants in the community. They referred frequently to the questions the facilitator posed and liked that he provided space and time for teachers to reflect on the questions before responding: “He would pose questions and he would let them kind of sit with
Participants valued the facilitator’s frequent communication and felt he was deliberate in asking questions that would bring the community together: “He posts a lot—he initiated it by posing the questions, setting up the format. Tried to really keep us all involved in what he was doing… He tried to get people to talk to each other by posing questions connecting the different activities.”

Participants also reported that he responded to every post or comment they made and felt that this gave purpose to what they posted. According to one teacher, “I’m pretty sure he commented on everything that I posted…it was always nice to know that at least he had read it and could say something about it.” Another teacher agreed, “It was just nice to know that someone was reading what I wrote, even if nobody commented. It could have been that many people read it, but you can’t tell that…You can’t tell if it’s having any impact, so having at least the facilitator respond and give you some feedback, you just kind of know that there was a purpose to putting something out there.”

Participants’ experience increased their comfort with and willingness to join other online communities of practice.

While all of the participants had participated in or led an online course, they had much less experience with online communities of practice. The participants reported that being part of PJs had increased their interest and comfort in participating in online communities. One participant said that being part of this CoP made her “brave in this sort of world now.” She continued, “To just get online and talk to a bunch of people that I don’t necessarily know sounded really uncomfortable to me, but it is something that I’m beginning to get more comfortable with and I’m beginning to be more excited about the possibilities out there.”

Another teacher said that her experience in PJs inspired her to explore social media venues where she can connect with others: “I’ve become very interested in other social media communities of math teachers…I’m curious about reaching out to other teachers and just seeing what else is out there…it’s just made me want to go out and do that more.”

Participants expressed frustration with Google community platform, and suggested that they may have participated more actively if the platform had been more user-friendly.

Participants agreed that the Google community platform was difficult to use, particularly when it came to navigation and searching for posts and resources. One participant commented, “I would get an alert on my iPhone, telling me somebody posted and then it would take me awhile to find it. Like I couldn’t figure out how to navigate where we were in the problem. I don’t think it was intuitive.” The other participants agreed and noted that the format of the posts and responses made it difficult to follow and participate in conversations: “I think one of the things that really bothers me about it [Google community] is when there is a post and then people respond to it…. The comments get listed just as a big, big long list and if you want to engage in a conversation and reply to somebody’s comment, you can’t do that…it gets added to the bottom of the list. You can put the person’s name in, but it gets
very confusing and it’s difficult to follow a conversation.” Participants also agreed that changing to a different platform with more user-friendly features would increase participation.

Participants did not feel that they were part of a connected community, which they attributed largely to the Google community platform.

When asked how connected they felt to others in PJ’s, participants said that they did not feel as if they were part of a community. They agreed that the difficulties they experienced using the Google platform contributed to this, but recognized that fostering a sense of community in a strictly online environment is no small task. According to one participant,

> It never really felt like a community to me and I think part of it is the platform, to be quite honest…. It felt like a place where you came and you put something, but it was hard to sort of really build up around that. But I also think it’s very difficult to build a community online. When I’ve participated in other communities online, it’s always been something that has an online component. But for me, in my experience, there’s always been some sort of other connection that was established beforehand.

A few participants also noted that they had been “overwhelmed” by the number of participants:

> Just the idea that there were 119 people out there. It did seem really big and very broad and people had very different interests...I think people brought so many different interests to the group, but maybe they weren’t articulated, maybe even for themselves at all times. So I’m wondering how that contributed to the experience of being in the community.

Along those lines, participants wondered if having a synchronous meeting at the start might help bring people together and possibly foster small groups of shared interest within the community.

Participants see great promise for Math with Your PJ’s On and offered recommendations to help future CoPs evolve to better meet the needs of educators.

Participants see great promise for Math with Your PJ’s On and believe it needs more time to grow and evolve. Four major recommendations emerged from the discussion:

- **Consider using a different platform.** Participants felt that the Google community platform was not user-friendly and suggested that they may have participated more actively if doing so was easier.
- **Create sub-divisions of participants based on interest.** Participants liked the idea of having more focused sub-groups within the community and believed this would help make the CoP more applicable to individual needs.
• **Add a synchronous meeting at the start.** Participants agreed that adding one or more synchronous online meetings at the start would help foster relationships among participants and perhaps help create sub-divisions of participants who could connect around more focused topics of interest.

• **Create accountability.** Participants noted that communities of practice tend to lack accountability. As a result, there is very little urgency to post or respond to posts, which they said makes it easy to stop participating altogether. One participant thought pairing up participants might increase motivation to be more active in the community. This is addressed in the next steps.

## Next Steps

Prior to the PJs experience, we believed that Bank Street alumni were a natural community of practice. They have shared interests and have articulated an interest in learning and working together to build repertoire. What we came to learn through the focus group, however, was that although there were several Bank Street alums in PJs, the large size of the community was a limiting factor to its success.

From our previous work on professional development, we know that educators place great value on content and resources that are directly applicable to their instructional needs. Feedback from the focus group participants indicated that without sub-groups, it was difficult to find such resources and to connect with other educators who share the same interests. Given that PJs spans multiple grade levels, participants may share an interest in the same content area, but the particular aspect of the content area they are interested in may be markedly different.

Based on recommendations from the focus group and our own experience with PJs, we decided to pilot a set of 12 much smaller online communities of practice around more focused topics over a ten-week period. In doing so, we attempted to create experiences that are more targeted and relevant for the participants within each community. We recruited volunteer facilitators who are educators with a passion or a problem that they wanted to discuss with others. The groups include sharing cases, discussing school-based problems, and supplementing face-to-face work. Each facilitator recruited participants and developed their own goals and norms to pursue in their CoP. For each group, we provided an initial one-week orientation about the technology, facilitation, and the interaction of the two. Additionally, we created a community for the facilitators to connect with each other and with Bank Street faculty to discuss successes and challenges. Although these 12 communities are just ending and data collection and analysis is not yet complete, we have observed improvements that reflect the challenges we addressed as a result of the PJs online community. Each is discussed in turn.

The platform. We felt that a free and ubiquitous platform was important in spite of some of the challenges of Google communities. To address this we designed a one-week orientation called the OnRamp during which we worked with facilitators on the technical challenges that might occur and presented some strategies for supporting an online CoP. We also allowed one CoP to use Edmodo so we could see how another free platform might work. This group had selected this platform because
they were familiar with it from other work.

In addition we made Bank Street’s tech support available to facilitators for unforeseen problems. We have also created a CoP manual to highlight the affordances of Google+ and head off any technical issues that might occur. This will be available online in Fall 2015 for general use.

Create sub-divisions based on interest. This was a primary concern. Google + is a bit clumsy for making groups within groups. It requires that one of the group members or the facilitator start a new group or establish an interest group. The latter seemed to create confusion for the participants since they were not sure where to post. For our new round of communities, we decided to set up smaller, interest-based local groups. The groups could then focus on local interests and concerns.

Synchronous meetings. We came to appreciate the value of synchronous meetings from discussions with colleagues and from the focus group. We included a synchronous “hangout” (a video conference) in the OnRamp to give people the technical experience and a better understanding of the value of the synchronous meeting. It was a chance for a diverse group of professionals to start feeling comfortable enough to begin sharing and thinking together. Modeling this activity helped participants see that the “hangout” can serve as an important trust-building tool.

Accountability. This is the most daunting of the issues that seems to face the online CoP. PJs is a CoP with no extrinsic motivator. People can come and go, post or not post, based on their interests. This can be both an advantage and a disadvantage. It is an advantage in that those who wish to just visit and collect resources can do so with no commitment. If the goal is a sustained investigation or conversation, the space becomes challenging because questions can be posted with no response. This then stands in the way of collaborative construction of knowledge and does not serve the progressive educator or alum who is philosophically alone in her/his school.

Discussion

Online communities of practice offer a forum for likeminded educators to connect across space and time. This project set out to explore how the affordances of social media outlets and tools can be leveraged to support long-term teacher professional development through online communities of practice. Our experience starting and maintaining PJs ishong with feedback from the participant focus group – provided valuable insight into the value of online CoPs, and more importantly highlighted key considerations for creating and sustaining a successful CoP. Among the most notable considerations is the role of the facilitator, the focus content area or topic, and participant interest and engagement, or lack thereof.

Role of the facilitator

Facilitating an online discussion is both similar to and different from facilitating a face-to-face (f2f) discussion. The choice of task is central to nurturing participant engagement, and the facilitator must
decide when to participate and when to let the group interact on its own. In an face-to-face class the instructor typically has some idea about who is engaged or in need of support. Online, engagement demands new norms (e.g., signals, such as a “like”) and new models for participation. On a Google community participants can “+1” a post or comment to indicate that they have read it. This is an easy way for participants, particularly those with limited time, to signal to the facilitator and other members that they are indeed engaging in the community. PJ participants did not make use of this feature, so it was difficult for the facilitator to know whether people were engaged and the extent of their offline participation. The challenge for the facilitator is therefore to invent other structures or activities to find this out.

More generally, facilitation needs to take into consideration the affordances of the technology when creating online activities to ensure that they can support dialogue and collaborative work, and ultimately lead to the creation of new knowledge. The tool can appear to be a barrier when face-to-face activities are simply transferred to the online medium. Forming smaller groups within the larger community is one way to address this.

CoP focus

A second key consideration is the focus of the CoP. We know from the focus group and our own work in the area of professional development that teachers are most interested in resources and strategies that address their instructional needs and can be easily incorporated into their teaching routine. Thus, participants are more likely to engage in a CoP that targets a specific content area than one that is more general. The decision of how narrowly or broadly to focus the CoP should be driven by the interests and goals of the participants. The dynamic and creative use of the platform will impact what is possible.

Participation

The final key consideration -- and one of the biggest challenges for online CoP facilitators -- is creating and sustaining participant interest and engagement. Several factors may contribute to low levels of participation. A major factor is time. Teachers have very limited time to engage in professional development activities. Although they may be interested in the content area of a CoP, they may struggle to find time to participate. The participants’ and/or the facilitators’ lack of familiarity with the online platform (e.g., Google community) may also partly explain decreased levels of participation. The frustrations often associated with learning and adjusting to a new platform may at first discourage participants from becoming an active member of their community. As these platforms become more ubiquitous, this should become less of an issue.

Accountability

Lack of accountability mechanisms within an online CoP also play a major role in participation. One of the major distinguishing factors between online communities of practice and online courses is the power wielded by the leader. In both forums, the facilitator (or instructor) can set expectations
for participation; however, facilitators do not have any effective incentives to ensure participation. In contrast, online course instructors assign grades to participants. By linking grades to participation, instructors have the benefit of a built-in accountability mechanism. Because no grades are assigned to members of a CoP, there is little incentive to participate. Including a statement of expectations in a CoP may affect the dialogue, but the facilitator has no “power” to insist on any participation. Participation is voluntary and at the whim of those involved. Though educators may join an online CoP with the best intentions, there are no tangible consequences if they do not participate. The facilitator must understand that this also means that the participants may not understand their responsibility to deepen and direct the community.

The results of this work support the notion that online communities are promising forums for teacher-directed, sustained professional development. In order for online communities of practice to work, however, additional research and experimentation is needed to identify effective incentives that will motivate sustained engagement. Facilitators and participants need to further reflect on how this new tool can work for them. Both need to imagine how to rearrange the furniture in this virtual room, and we as researchers and practitioners need to figure out which ways best support learning.

References


**Marvin Cohen** is a senior faculty member (Niemeyer Chair, 2005) at Bank Street College of Education. He teaches both mathematics pedagogy and content classes and advises in the Leadership in Mathematics Education program. Dr. Cohen’s recent work with colleagues has focused on the development and implementation of 10 video case studies, Math for All (Corwin, 2012), aimed at increasing access to meaningful mathematics for all children in grades K–5. He was scholar in residence at the Ben Franklin International School, Barcelona, Spain, in 2010. Most recently, Dr. Cohen directed the Communities of Practice Project at Bank Street.

mcohen@bankstreet.edu

**Babette Moeller** is a distinguished scholar at the Center for Children and Technology (CCT) of the Education Development Center (EDC). As director of numerous EDC research and development projects, she contributes her extensive experience in designing and implementing technology-supported programs in both general and special education, providing professional development for teachers and administrators in a variety of settings, and conducting formative and summative evaluation research.

bmoeller@edc.org

**Michelle Cerrone** is a researcher at the Center for Children and Technology (CCT) of the Education Development Center (EDC). Her work focuses on STEM education, particularly in the areas of teacher professional development, the role of digital media in K–12 classrooms, and the development of cognitive diagnostic assessments.

mcerrone@edc.org