

**Developing a voluntary teacher community:
The role of professional development, collaborative learning and conflict**

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Developing a voluntary teacher community:
The role of professional development, collaborative learning and conflict

Teacher learning communities are hailed by many as vehicles for reforming and elevating the professional status of teaching (Westheimer, 1998; McLaughlin & Talbert, 2006). Starting in the mid-1980's efforts to build teacher community rode in on a "second wave" of educational reform, which focused attention on reforming the teaching profession and, specifically, teachers' professional culture (Westheimer, 1998). However, a review of the general literature raises important questions about whether teacher communities are up to this task. Much of the existing research values teacher communities as means to discrete, and often short-term, ends (Mandinach & Honey, 2008; Cochran-Smith & Lytle, in press; Stoll, Bolam, McMahan, Wallace, & Thomas, 2006; Vescio, Ross, & Adams, 2008), such as data-driven improvement and higher test scores. There are fewer examples of research that examine the potential of teacher communities to achieve long-term goals, such as changing or challenging teacher beliefs about teaching and learning.

Creating the conditions for interactions that challenge deeply-held beliefs about teaching and learning may require enacting experiences and processes designed specifically to build teacher professional communities' ability to resist cultural and institutional impediments to reform. Additionally, previous research has shown that internal dynamics, or micropolitics, strongly impact a group's ability to engage in challenging conversations about their practice (Achinstein, 2002). Our research attempts to discover the features that help teacher communities resist reform impediments and nurture more meaningful relationships. Our analysis focuses on a group of middle- and high-school teachers who work with a non-profit to engage urban students in environmental studies. We examine teachers' perspectives on professional development and teacher communities to determine how best to support them in developing a community. To gain a better understanding of a community's internal dynamics, we focus our analysis on teachers' commitment to long-term goals, such as examining their assumptions about learning and teaching. Specifically, we ask: What are teachers' views of professional development and teacher communities? Why would a teacher choose to become an active participant in a teacher group? How do teachers' perspectives on community influence their investment in collaboratively confronting deeply-held beliefs about pedagogy and practice?

THEORETICAL FRAMEWORK

Characteristics of Teacher Community

In an effort to evaluate how teacher learning is affected by the dilemma between short- and long-term goals, we use a definition of "teacher community" as that which actively opposes historical impediments to teacher learning, such as isolation/individualism (Lortie, 2002) and powerlessness (Lagemann, 2000), by encouraging teacher inquiry (Cochran-Smith & Lytle, 1999) or some form of critical reflection. As described by McLaughlin and Talbert (2006), these types of communities, which they call "learning communities," are characterized by a more progressive view on teaching and learning. As viewed here, teaching involves building close relationships (or, community) with students, and teachers engage in collaborative learning via inquiry and mentoring (McLaughlin & Talbert, 2006).

Teacher community, then, is more specifically characterized by shared values and beliefs

(Stoll et al., 2006; Vescio et al., 2008) regarding the community's collective orientation towards effective pedagogy, meaningful content and, more generally, the purpose of education. Perhaps most importantly for our study, previous research shows that teachers' shared beliefs about the purpose and proper structure of professional development is integral to a community's internal dynamics. Additionally communities vary according to their focus on student learning (Vescio et al., 2008), or the ability of the community to connect theory or ideas to the everyday practice of the individual teachers in the group. The following characteristics describe characteristics of a community's internal, and interpersonal, dynamics: reflective dialogue/inquiry (Stoll et al., 2006), ability to manage internal conflict (Stoll et al., 2006; Vescio et al., 2008), collective responsibility (Stoll et al., 2006; Vescio et al., 2008), and mutual trust (Stoll et al., 2006). We will examine the role played by these characteristics in the work of the non-profit group.

In "effective" communities, all participants are valued contributors who both openly discuss and question their assumptions about teaching and, when necessary, challenge those of others; built on mutual trust (in discussing difficult topics) and responsibility for both individual and communal learning, these communities are oriented towards long-term goals, such as changing the way teachers approach their practice. However, because the topics discussed involve teachers' deeply-held beliefs about teaching and learning, a group's ability to make productive use of conflict is integral to its effectiveness. Our analysis will focus on how these various characteristics of community lead (or not) to productive dialogue of the kind described above.

Obstacles to Effective Teacher Community

Because they are most commonly located within "the prevailing accountability frame" (Cochran-Smith & Lytle, in press, p. 31), teacher communities with larger, long-term goals are often complicated by the need for short-term, instrumental gains. The "accountability frame" refers to the common practice, of policy-makers, district- and school-level administrators, to measure teacher effectiveness according to her/his ability to produce gains in student test scores. The demand to achieve such short-term gains has inhibited the creation of effective teacher communities by focusing on external pressures to the neglect of a community's internal dynamics.

Accountability pressures, in part, have contributed to what Westheimer (1998) calls "a strictly organizational view of reforms," which "obscures significant cultural factors that facilitate or block the formation of teacher professional communities" (p. 23). Reforms often fail because reformers and teachers have different, and at times incompatible, goals and concerns (Kennedy, 2005). Teacher community is surely no exception. Often, efforts to build instrumentally successful teacher learning communities overlook the human and cultural elements of teacher collaborative learning (Datnow, Park, & Wohlstetter, 2007). Referring to communities designed to achieve deeper, more long-term goals, Westheimer summarizes the problem as follows:

If schools are to pursue such communities successfully, then researchers and policymakers should profit from learning how teachers view their workplace, how they define community, and how they struggle with the dilemmas of building professional communities amid competing visions. (Westheimer, 1998, pg. 29)

The interpersonal impediments to community participation have historically been overlooked by reformers bent on achieving short-term goals. Our research, then, attempts to shed light not only on how teachers define community, but also how that definition affects their participation in a learning community.

Non-School-Based Teacher Community

In addition to their value for teacher learning, non-school based teacher communities can be ideal venues for research on the interpersonal dynamics of a teacher community. McLaughlin and Talbert (2006) extol “off-site” professional development as opportunities for teachers to “access knowledge for content instruction, to rethink their practice, and to experience learning in a community of peers” (p. 65). In this way, off-site professional development can function as training grounds to prepare teachers to participate in (or to initiate) school-based community. This type of preparation is often absent from traditional (Bianchini & Cavazos, 2007; Pomson, 2005) and alternative (Melville & Wallace, 2007) preservice teacher education.

Further, teachers who participate in non-school based teacher community often do so not because of (and sometimes in spite of) pressure from administrators. Instead, teachers participate in the community because they feel it will provide some degree of personal or professional benefit. Additionally, since non-school based teacher communities are commonly facilitated by persons external to a teachers’ particular school, they offer insights into teachers’ participation in a community that is uncomplicated by an administrator’s power or, potentially, by the competition among peers. The community’s goals, then, and the outcomes of participation in voluntary, non-school-based communities are largely determined by the expectations of the individual participants.

Conflict and Teacher Community

Teacher community, as we define it, is a space where a collective educational ethic is nurtured by the multiple (and unique) perspectives of each member (Grossman, Wineburg, & Woolworth, 2001). As individuals in a community become more comfortable challenging each other’s assumptions, conflict and discomfort emerge as threats to individual participation and to the formation of a collective identity (Westheimer, 1998; Grossman et al, 2001; Little, 2003; Abbate-Vaughn, 2004; Achinstein, 2002; Dooner, Mandzuk, & Clifton, 2007; Wood, 2007). Mature communities are able to deal with conflict openly and to make productive use of difference (Grossman et al, 2001). When disagreements are discussed openly, a community is better able to craft a common goal and approach to pedagogy that considers the perspectives of all participants, not just those with dominant voices. Pseudo-communities, however, are characterized by dominance of the collective over the individual, where the individual feels reticent to express an opinion that might upset the group’s perceived unity. A community’s ability to deal with conflict has a significant impact on its capacity for supportive conversations about teachers’ deeply-held beliefs.

Previous research provides a guide for understanding the common sources of conflict in teacher communities. In their case study of an English and history department “book club,” Grossman et al. (2001) nuance our understanding of the role of conflict in communities by situating it among several “tensions,” such as subject-matter “fault-lines” and professional development goals. We learn that conflict arises, for example, when community members have

opposing views on how best to learn their particular subject-matter or when the group struggles to navigate the space between consensus and diversity. Additionally, the authors found that the “essential tension” of professional development, or the familiar tension between professional development that is geared towards pedagogy and that which is content-centered, is a persistent source of conflict. Their portrayal of how teachers negotiate the “essential tension” of professional development complicates existing notions of what it means to have common goals (Grossman et al, 2001). Surely, for example, communities can share goals while disagreeing about how to structure professional development to reach those goals.

Achinstein (2002) frames conflict as a function of the difference between macro- and micro-level ideologies about teaching and learning. Macro-level (or, dominant) ideologies make up the accountability frame mentioned above. Macro-level ideology refers to the beliefs and perspectives that drive dominant trends in education policy and administration, especially the emphasis on test-score accountability to measure teacher effectiveness. Additionally, macro-level ideology adheres to a specific belief about student learning. As Achinstein describes, macropolitics is that which believes that the purpose of school is to “socialize students into the current society” (p. 445). Put differently, the macropolitical perspective holds that the purpose of education is to provide students with the skills necessary to participate in society as it exists today. Micro-level ideology refers not to a fixed set of beliefs, as above, but instead to the shared beliefs of a particular teacher community. Micro-level ideology could be aligned with, or share the beliefs of, the macro-level ideology, or it could take “a more critical view of schooling practices, a notion of schooling for social justice, and a transformative vision of the role of education in society” (p. 445). A more critical micro-level ideology, for example, holds that the purpose of education is not to assimilate students into society but to prepare them, instead, to make meaningful social change.

When the ideology of the group mirrors the macro-level ideology, internal conflict goes unacknowledged and teachers are more likely to critique external factors, such as their students’ motivation, rather than their pedagogy or practice. Achinstein’s theory holds that the macro-level ideology does not value teacher reflection or collaborative critique as essential components of teacher collaboration. However, when conflict is itself a part of the group’s foundational characteristics (ie. when the micro, the group, opposes the macro, the dominant view) internal conflict is embraced. In the case of the latter, internal conflicts are tempered by the fact that community members “still maintained a high degree of consensus about their ideology of schooling” (p. 448). Although the beliefs of the individual group members led to internal conflict, the cohesion of the community was maintained by fact that the group, as a whole, rejected dominant conceptions of the purpose of education.

The research on conflict in community addresses important questions about the function of shared beliefs in a community’s interpersonal dynamics. The research shows us, for example, the types of beliefs that affect teachers’ relationships in a community, most notably: beliefs about subject matter (Grossman et al, 2001) about the proper design of professional development (Grossman et al, 2001), and about, more generally, the purpose of education (Achinstein, 2002). Our study adds to existing research by addressing a belief that is both overlooked in the literature, yet fundamental to the creation of an effective community: teachers’ beliefs about the purpose of community. Specifically, we are able to focus on how teachers’ views of community impact their contribution (or not) to a voluntary community. We use the following questions to guide our research: What are teachers’ views of professional development and teacher communities? Why would a teacher choose to become an active participant in a teacher group?

How do teachers' perspectives on community influence their investment in collaboratively confronting deeply-held beliefs about pedagogy and practice?

METHODS

Below we discuss the context of our research, a non-profit that provides long-term professional development to a community of secondary science teachers. We outline the main components of the professional development program, paying close attention to efforts made to create an effective teacher community. Additionally, we provide a detailed characterization of the teachers in the community, especially the subset of teachers chosen for interviews. Lastly, we discuss our two primary modes of data collection and describe our rationale and methods that guided our data analysis.

Context

During the 2007-08 school year, the participants in this study (i.e. secondary science teachers) received resources and training from a non-profit, EE¹, located in a major northeastern city. At the time of our research, EE had been working with teachers, school administrators and city residents for ten years. As described on its website, EE's mission is "to help urban communities build healthy, vibrant cities by educating residents about their environment [and] engaging them in the transformation of their neighborhood." EE had two primary programs, one devoted to local- and state-level environmental advocacy and the other devoted to providing urban ecology field experiences for inner-city science teachers and their students. A still-emerging field of science, urban ecology is the application of systems thinking to environments that are heavily affected by human activity. The EE curriculum, written primarily by EE staff and through consultation with outside experts, was designed in the constructivist tradition to explore, through outdoor investigations and in-class enrichment, the health of the urban ecosystem. Curriculum modules targeted grades 7-12 in required and elective science courses of all kinds. Students who used the EE curriculum engaged in outdoor explorations of the health of an urban "field site," including studies focused on urban bird biodiversity, water quality and environmental injustice. Field investigations encouraged student-driven scientific inquiry and data collection in the urban context.

In addition to the curriculum described above, EE offered its teacher-partners a multifaceted professional development portfolio. EE's professional development menu included a four-week intensive summer institute, a series of callback workshops during the school year and in-class assistance via an AmeriCorps*VISTA field associate. The EE summer institute aimed to provide intensive content and pedagogical training while offering teachers opportunities to work together to design and implement an urban field investigation. EE's series of callback workshops, held roughly once every six weeks, were designed to provide teachers with additional content knowledge related to EE's curriculum modules while also creating a venue for teachers to critically reflect on their practice. A typical workshop included a content lecture from an expert – often a local professor, graduate student or an experienced teacher – and an opportunity to examine student work or discuss innovative approaches to pedagogy. Workshop

¹ EE is being used as a pseudonym for the name of the non-profit environmental organization.

topics during the 2007-08 school year were both content-specific (i.e. “Environmental Justice”) and pedagogically-oriented (i.e. “Supporting Students in Scientific Argumentation”). EE’s AmeriCorps*VISTA field associates mainly supported teachers who were new to the EE community. In addition to bringing resources to a teacher at her/his school site, field associates often modeled lessons for beginning teachers and assisted with lesson planning.

The EE program tried to nurture a sense of community among EE teachers primarily via its summer institute and callback workshops. The summer institute was an intensive 16-day experience where teachers were paired together to learn, in detail, a specific EE-developed curriculum module. For the final 8-days of the institute, teacher pairs worked with a small group of local urban high school students (5-8 students per teacher pair) to develop and implement an urban field investigation. Teachers were asked to reflect on how to make changes to their pedagogy to incorporate the themes covered during the summer. Additionally, working in student-teacher team to implement a field ecology investigation, participants were challenged to collaboratively find solutions to important pedagogical problems, such as those related to student misconceptions or lack of student engagement with the material.

The callback workshops were designed to build on the relationships formed during the summer. While topical in nature, each workshop had a component that challenged teachers to reflect critically on effective pedagogical practice. Teachers at the Environmental Justice workshop, for example, were asked to reflect on and respond to a fictionalized case study of student misconceptions with the material. Additionally, teachers were asked to reflect on how to change their instructional practices to facilitate greater student understanding of the material. Other workshops challenged teachers to examine student work and collaboratively design a new lesson plan in which they altered their own strategies to better meet the needs of their students. Sessions like these were designed to elicit teachers’ open reflection on effective pedagogy and to encourage participants to ask each other questions about their approach to teaching or their assumptions about student learning.

Participants

Any secondary science teacher in the metro area was welcome to become a part of the EE community. Most commonly, however, EE teacher-partners worked in the area’s largest public district. At the time of our study, of the over 55,000 students in this district, 76% of students were eligible for free- and reduced-price lunch and 43% came from homes where English was not the primary language spoken. The student body was 39% Black, 37% Hispanic, 13% White, 9% Asian, 2% multi-racial, and <1% classified as other. EE also supports teachers in smaller, neighboring suburban districts. Of the approximately 2,510 students in EE’s most represented suburban district, 24% of students were eligible for free- and reduced-price lunch, and 27% came from homes where English was not the primary language. The student body there was 79% White, 8% Hispanic, 7% Asian, 4% Black, 2% multi-racial and <1% Native American. At the time of this research, all teachers came from schools that were either designated as public or received a considerable amount of public funds.

At the time of our interviews, EE had active relationships with 31 science teachers, representing a range of grade levels, from seventh to twelfth grade, as well as a range of science classes. Teacher-partners were considered “active” if they received at least one of the three types of support described above during the 2007-08 school year. While some teachers attended the summer institute and all of the subsequent callback workshops, others communicated with EE

exclusively via their field associate. Most teachers fell somewhere in the middle, attending workshops occasionally and communicating with their field associate or other EE staff as necessary.

As seen in Table 1, the subset of 14 teachers chosen for interviews was selected to mirror the characteristics of the larger group in the following categories: type of school, grade-level, subject taught, years with the EE group, total years teaching and the level of support received from the EE program. Interviewed teachers represented five types of public schools: pilot, themed, traditional, public exam and vocational technical. Pilot schools had brokered contract agreements with the district to allow for more flexibility in their budget, hiring and curriculum decisions. Because each pilot school had a different agreement with the city, it is difficult to generalize across schools. Often, however, pilots had a higher teacher-to-student ratio and greater flexibility regarding the implementation of externally-developed curricula. Themed schools had received grant money to redesign their school's identity to attract students who are interested in a particular topic or career. Our teachers, for example, represented schools that focused on urban science, environmental science, and social justice. Often, also, themed schools were converted, from large "traditional" schools, to smaller academies with a more personal feel and smaller student enrollment. Traditional schools were normally large, unbroken schools that adhered to the city's hiring and curricular decisions. Our subset also includes a teacher from one of the city's three public exam schools and the city's vocational technical high school. The final school type was the special education magnet school, which enrolls students from public districts in the metro area. Teachers interviewed from these schools worked with students who have a range of behavioral, developmental and physical disabilities. The one teacher we selected from the suburban school district is highlighted in italics.

Grade levels in our subset range from 7th through 12th, and course topics range from General Science to Physics to Environmental Science. Required science courses are highlighted in boldface. Additionally, years of teaching ranges from 1 to 25 as reported by the teacher in the EE end-of-year survey. Teachers' experience with EE ranges from 1 to 7 years and includes teachers who had received any of the professional development opportunities described above.

Table 1: Characteristics of interviewed teachers

School Type	Grade Level and Topic	# Years Teaching	# Years with EE
Pilot High School	9th Grade Physics	7	6
Themed High School	10th Grade Chemistry	3	3
Exam School, 6-12	12 th Grade Environmental Science	3	1
Pilot Middle School	7th Grade General Science	2	1
Themed High School	12 th Grade Environmental Science	15	1
Vocational Technical High School	10th Grade Biology , 12 th Grade Environmental Science	8	6
Traditional High School	11 th Grade Environmental Science	1	1
Pilot High School	11th Grade Chemistry	8	4
Special Education Magnet	9th Grade Biology	5	2
<i>Traditional Middle School</i>	7 th Grade General Science Enrichment	3	3
Themed High School	Mixed-Grade Urban Ecology	1	1
Pilot High School	12 th Grade Environmental Science	6	3

Special Education Magnet	Mixed-Grade Physics	8	5
Themed High School	12 th Grade Environmental Science	7	7
Themed High School	11th Grade Chemistry	2	2
Traditional High School	9th Grade General Science	25	4

Data Sources

We used a mixed method design combining both quantitative and qualitative data sources. Quantitative data were generated from a teacher survey completed by all active EE teachers. Qualitative data were gathered from structured, open-ended interviews conducted by two members of the research team with a representative subset comprised of 14 EE teachers.

At the end of each school year, EE administers a teacher survey instrument to all participating teachers to gauge, generally, its impact on their classroom practice and their beliefs about student learning and professional development. Following the 2007 school year, the survey was completed by all 31 active teachers and included over 150 items ranging from their confidence with the science content to their beliefs about student-driven inquiry. We are interested, specifically, in teachers' responses to the three items regarding their views on teacher community. Discussed in more detail below, this particular scale asked teachers if they felt a sense of belonging to the EE teacher community, if they felt invested in the EE community and if they felt it is important to advocate for the EE community at their schools. Responses were recorded on a 5-point Likert scale with options ranging from "Strongly Disagree" to "Strongly Agree."

To gain a better understanding of teachers' definition of community and their beliefs about community participation and professional development, we then interviewed 14 of our active 31 teachers. Interviews were conducted during the spring of 2008 with teachers who were receiving support from the EE program during the 2007-08 school year. Each interview took 20-30 minutes and consisted of ten questions divided under three main topics: teacher beliefs about teaching science and urban ecology, the role of professional development, and the meaning of teacher community.

Interview prompts were designed collaboratively by members of the research team. Our overall purpose was to compare teachers' reflections on science teaching, professional development and teacher community (all broadly defined) to their experiences in each of those areas while working with EE. We asked, for example, teachers to compare the challenges associated with science teaching with those related, more specifically, to teaching urban ecology. We also asked teachers to imagine and articulate an ideal professional development and then compare their image to their experience in the EE program. Lastly, teachers were asked to define "teacher community" and then contrast their definition with their perception of the EE group. Please see Appendix A for the full interview protocol and list of probing questions.

Data Analysis

Data from the teacher survey was tallied and the percentage for the teachers' responses were compared for each item. These trends were considered during the analysis of the interview data. All fourteen teacher interviews were transcribed. Interviews were then analyzed using a coding scheme that was developed from both the theoretical framework and an iterative analysis of the transcriptions (Miles & Huberman, 1994). Our approach to coding was consistent with that

of Seidel and Kelle (1995) who describe interview codes as “the decisive link between the original ‘raw data’...and the researcher’s theoretical concepts” (p. 52). Codes were generated through collaborative discussion among the members of the research team and were selected to capture common themes as well as the characteristics of community as defined above.

For example, when asked why s/he decided to start working with the EE group, every teacher mentioned learning about the group from another colleague. A code was then developed to capture the high frequency of these responses. We also coded for mention of characteristics, such as collective responsibility for each other’s learning, that, according to our theoretical framework, are essential elements of an effective community. We looked, for example, for reference to feedback or collaborative critique regarding teacher beliefs about meaningful professional development. Each question and probing question had its own code structure, and codes were recorded only in reference to the particular question asked. Additionally, multiple codes were possible for each teacher on each question. If a teacher, for example, mentioned receiving critique, learning a new lesson plan and socializing as valuable elements of professional development, then three codes were recorded for that teacher’s response to that particular question. Table 2 lists the codes used in our data analysis and provides a brief description of each.

Table 2: Summary of interview codes

Interview Question/Prompt	Description
What is your definition of a teacher community? What are the characteristics of a community?	Codes related to this question sought to compare teachers’ conceptions of “community” with those prevalent in the literature. We looked, for example, for mention of common goals or for recognition that colleagues can be resources for one’s learning.
Imagine you just attended an excellent professional development workshop? What types of things would you expect to see? What were the teachers doing?	Respondents were asked to discuss professional development in general, rather than in the context of the EE program. Codes were designed to capture various articulations of teacher-to-teacher collaboration, from socializing to engaging in critical collaborative dialogue.
Why did you consider this an excellent professional development workshop?	This question asked teachers to reflect on their vision of an “ideal” professional development experience. The coding scheme sorted answers into four categories: opportunities to socialize, receive materials, learn new pedagogy and learn new content.
What challenges do you feel arise in teaching urban ecology?	Respondents, here, were asked to reflect specifically on their implementation of the EE curriculum. Codes, generated primarily from an iterative analysis of the transcripts, include references to difficulties with content, pedagogy and student management.
What are some areas of your	Respondents were asked to reflect on their teaching in

teaching that you would like to improve?	general, rather than their implementation of the EE curriculum. Codes reflect teachers' responses to the prompt and include topics ranging from student management to comfort with the science content.
How can EE help you improve your teaching?	This question asked teachers to reflect on their targets for improvement and describe how EE, if at all, can help them reach their goals. Codes, here, looked for mention of opportunities for collaborative learning, such as teacher networks and EE workshops.

Twenty percent of the interviews were independently coded by two raters. Inter-rater reliability was calculated by percent agreement, and the average inter-rater reliability was 80% with all disagreements resolved through discussion.

RESULTS

In this section, we discuss the teachers' beliefs about the role of professional development and the meaning of teacher community. First, we describe the results from the survey of all thirty-one active teacher participants in the EE community. Then we examine teachers' definitions of community and high-quality professional development, focusing on their apparent interest in collaborative critical dialogue. Finally, we look at teachers' stated targets for improvement and explore the relationship between teachers' stated goals with their expectations for collaborative learning.

As seen in Table 3, the teacher survey, completed by all EE teachers, suggests that while most teachers value their role in the EE community, there is quite a bit of variation regarding teachers' sense of belonging to, and investment in, the community. These data indicate that, contrary to the standard, exhibited in effective communities, of collective responsibility for the participation and learning of all community members, some teachers felt uninterested, or even disaffected, from the core of the EE community.

Table 3: Teacher survey results (n = 31)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I feel a sense of belonging to the EE teaching community.	0%	10%	19%	36%	36%
I am invested in the EE community.	3%	0%	16%	32%	48%
Advocating for the EE community is important to me.	0%	0%	26%	32%	42%

While the surveys provided us with an understanding of the variation of investment

within the EE community, it did not give a sense of how the teachers defined a teacher community or what benefits they observed in being a part of this teacher group. We, then, conducted structured, open-ended interviews with a representative sub-set of EE teachers to gain greater insight into these two questions. The teacher interviews conducted tried to expand upon the teacher survey by eliciting teachers' articulations of community and its benefits.

As Table 4 shows, we observed interesting points of consensus regarding teachers' characterizations of community.

Table 4: Teacher-defined characteristics of a “teacher community” (n=14)

	Percent Responded
Colleagues are resources for one's learning	71%
Groups has a common goal and stable norms of interaction	43%
Asking colleagues for instructional resources	21%
Getting feedback/criticism	0%

Teacher definitions of community were not explicitly linked to the conception of community, described above, as collaborative critical dialogue. Perhaps most strikingly, no teacher defined community as a space for feedback or criticism. Characterizations of community and its benefits relied, primarily, on imprecise terminology, potentially due to teachers' lack of awareness with the term itself. For example, in referring to “teacher community” a middle-school teacher explained that

I've never thought about that before, but thinking about it now, it's just having a group of teachers who are in a similar situation or maybe not so similar, but they have a similar day and you can discuss everything from what you do with your students, how it works out, what types of students it works best with

Many teachers felt that communities need to have a common goal or purpose, but did not explicitly discuss specific goals. Typical of these responses a high school teacher defined community as “teachers working towards a common goal and who know each other and know what goals their working towards.” Additionally, the majority of teachers viewed community members as resources for each other's learning. Another high school teacher remarked that teachers in a community are “willing to share their content knowledge [and] pedagogical skills.” Teachers, however, did not discuss what they hoped to learn from such interactions. Did teachers have opposite (and potentially competing) perceptions of the goals of community? What did they feel they could learn from their colleagues or gain from community participation?

A closer look at the interviews provides examples of the type of learning teachers look for in community settings. When discussing community, for example, one teacher talked mostly about student work, instead of teacher learning. He wanted to learn what kind of work his colleague's students were producing. He hoped that community would help him become “[familiar with] the work that students have done or... [get] a sense of what others schools are like, what interesting things they have done.” Additionally, a middle school teacher discussed day-to-day needs. She defined community as something that would be “just very functional as

far as on a day to day basis, what I need, what I don't need. If I need lined paper, running to a classroom and getting lined paper and things like that." Teachers, as in the examples above, generally framed community as that which helps them achieve concrete, individual goals, such as learning new lesson plans or receiving instructional resources. While this type of learning is clearly valuable for teacher practice, it is long way from the collaborative critical dialogue that makes teacher community a potentially powerful venue for teacher learning.

As with their definition of community, teachers' description of their ideal professional development experiences privileged short-term and individual gains. We asked our participants to imagine they had just attended an ideal professional development workshop. Probing questions asked them to describe what they learned and how they learned it. As illustrated in Table 5, we observed that teachers valued interaction and socialization as important components of a good professional development experience. Again, receiving feedback or constructive criticism were not part of teachers' hopes for their professional development.

Table 5: Activities at teachers' ideal professional development experience (n=14)

	Percent Responded
Receive new resources	36%
Network or socialize with other teachers	36%
Opportunity to lesson plan	29%
Opportunity to learn new curriculum	21%
Model student learning/take the perspective of a student	21%
Get feedback or constructive criticism	14%
Assess student work	7%

A follow-up question asked teachers to explain why their imaginary professional development experience was ideal. Table 6 shows that, although there was some variation, not one teacher seemed interested in learning new or improving existing pedagogical practice. Instead, teachers, talked about using community to achieve individual goals, such as lesson planning. One teacher, at a pilot high school, explained that the workshop designer and facilitator should think "about what work do teachers have to do anyway for their students and how can we have them help each other work on that." Another teacher, who felt that the EE group provided colleagues as a resource for her learning, described professional development as a "swap-meet" where "you can feel free to talk to people and get things from people." Workshops seemed best intended to supplement, rather than question or challenge, a teachers' existing pedagogical approach.

Table 6: Reason professional development was described as ideal (n=14)

	Percent Responded
Opportunity to collaborate or socialize with other teachers	36%
Content Learned	29%
Materials Received	21%
Pedagogy Learned	0%

Teachers' goals for professional development were linked to their perceptions of how they can improve their teaching. We first asked teachers to describe the challenges they face when teaching urban ecology (Table 7). We then asked them to discuss, more generally, areas of their teaching that they would like to improve (Table 8). Taken together, responses to both questions indicate that teachers were not coming to professional development with goals that required deep critical reflection.

Regarding their teaching of urban ecology, 57% of teachers did not discuss any challenge explicitly. Instead, teachers described challenges that had been overcome, such as learning new content, or highlighted shortcomings in the curriculum. One teacher, for example, explained that she was originally challenged by the fact that urban ecology "is a new field in science" and therefore not taught extensively in her undergraduate or teacher preparation programs. Other teachers characterized the curriculum as offering "little in the way of assessments," requiring them to take extra time "to create all the assessments that go along with it."

As seen in Table 7, the few times that teachers did discuss their pedagogy, they focused mainly on problems related to student management, especially in an outdoor setting. While such skills are undoubtedly valuable for teacher success with urban ecology, they do not necessarily require collaborative critical dialogue with their peers.

Table 7: Challenges related to teaching urban ecology (n=14)

	Percent Responded
Did not discuss any challenge explicitly	57%
Problems related to inquiry-oriented pedagogy, including managing students outdoors	21%
Anything related to urban ecology as an emerging field	7%
Making real-world connections	7%
Data analysis	7%
Students lack proper background knowledge	7%
Anything related to literacy strategies	0%
Covering district- or school-mandated curriculum	0%
Science content is not challenging for their students	0%

The data here indicate that teachers were not primarily interested in critically reflecting on their practice. Instead, the type of learning derived from challenging one's deeply-held beliefs about teaching and learning is obscured by teachers' desire to improve (but, not question)

their current approach to teaching.

Similar to the results in Table 7, Table 8 shows that teachers appeared to be interested in skills that do not require reflection or collaborative critical learning. Teachers talked about needing additional resources like “a science lab” and “a Bunsen burner.” Especially in an urban district, predictable and justified comments like the following are common: “just being able to have access to materials, again, that’s my real big stumbling block. I’d love to do some chemistry, but I just don’t have the chemicals.” Additionally, goals such as improving organizational skills and student management were mentioned quite frequently. One teacher explained that “I’m just disorganized with papers and I need to get better organized.”

Table 8: Targets for improving pedagogy in general (n=14)

	Percent Responded
Organization skills, including planning lessons, preparing for class or returning student work	29%
Lack of student engagement with the material	21%
Managing students, in-class and outdoors	21%
Student reading and writing skills	14%
Lack of comfort with new materials, including information technology	7%
Leading classroom discussions	7%
Student frustrations with inquiry-oriented science	7%
How to anticipate and resolve student misconceptions	0%
Lack of comfort with inquiry-oriented pedagogy, including asking a good research question and designing an experiment	0%
Lack of comfort with the science content	0%
Student presentation/argumentation skills	0%

When asked about their pedagogy in general, however, teachers targeted areas for improvement that are slightly different from those highlighted in Table 7. As seen in Table 8, teachers, with moderate frequency, cited “lack of student engagement with the material” as a possible venue for improvement. Unlike the challenges described above, this goal is more commonly a subject of deep collaborative dialogue and critical self-reflection. One teacher hoped to get her students to “have more of a conversation.” Another asked how to get students “engaged on a question that carries over a whole year” and to create a “safe place where they can make risks and know that is part of the process.” Teachers who talked about student engagement often framed the problem in terms of understanding how to make curriculum “real to their [students] own lives” and “motivating them and also letting them teach themselves.” Teachers felt they could improve their pedagogy by understanding “where the disconnect is” and finding innovative ways to frame the material.

The teachers who cited “lack of student engagement” as a pedagogical goal, however, believed that the best way that EE could help them improve student engagement is through the creation of additional curriculum resources. Additionally, as seen in Table 9, none of the

interviewed teachers felt that EE could help them reach their goals by providing more opportunities for collaboration at workshops or critical feedback on their own teaching. These data indicate that teachers view student engagement problems as the potentially the result of curricular, not pedagogical, shortcomings.

Table 9: Ways EE can help teachers reach their goals (n=14)

	Percent Responded
Curriculum Development	42%
Provide more in-class assistance	14%
EE can't help	14%
Create teacher networks	0%
Provide more workshops	0%

The data described above indicate that although teachers in the EE community felt that they could learn from their colleagues, they were commonly concerned with individual and short-term goals. Additionally, teachers appeared to value networking and socializing above receiving feedback or constructive criticism. Based on articulations of pedagogical challenges and goals, teachers seemed to come to the EE community in hopes of socializing, networking or achieving short-term goals that do not require deep critical reflection. Although a limited number of teachers did want to work on aspects of their teaching that require such reflection, they did not view workshops and community as a venue for working towards these goals.

CONCLUSIONS AND EDUCATIONAL IMPORTANCE

In this section, we address the implications of EE teachers' apparent focus on goals that do not require deep critical reflection. Based on our findings, we establish a potential hierarchy of teachers' needs. We then explore two factors that have a fundamental, though poorly-understood, impact on teacher collaborative learning: a community's ability to openly address conflict and teachers' beliefs about community. We conclude with suggestions for further research related to these two topics.

Hierarchy of Teachers' Needs: Long-term vs. Short-term Goals

Westheimer's (1998) case studies of two middle school teacher communities found that building teacher community requires more than simply establishing shared beliefs, that the particular beliefs of communities matter. Our research, similar to previous studies (Grossman et al, 2001; Achinstein, 2002), has demonstrated that teacher beliefs about the proper role of professional development are important to a community's cohesion. Our study adds to existing research by showing that teacher beliefs about the definition of community may have an impact on their expectations for collaborative learning. While EE teachers valued learning from one another as a defining characteristic of community, most respondents framed community as that which helps its members achieve concrete, individual goals, such as acquiring instructional resources and planning new lessons. Conversations that challenge teachers' beliefs on student learning and effective teaching were largely missing from our teachers' conceptions of ideal

professional development. Additionally, EE teachers rarely defined community according to the elements of effective communities identified in the literature: reflective dialogue/inquiry (Stoll et al., 2006), ability to manage internal conflict (Stoll et al., 2006; Vescio et al., 2008), collective responsibility for each other's learning (Stoll et al., 2006; Vescio et al., 2008), and mutual trust (Stoll et al., 2006).

Although many studies cite accountability pressure as a primary obstacle to effective teacher communities (Mandinach & Honey, 2008; Cochran-Smith & Lytle, in press; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006; Vescio, Ross, & Adams, 2008), our research indicates the presence of additional obstacles related to teachers' longstanding isolation from their colleagues. Though its certainly not exclusive to urban districts, it is unfortunately common that teachers operate in a cellular environment where they rarely receive the resources they need to teach effectively. Understandably, teachers interviewed for this study seem to look to the EE group to address these needs first. In discussing their ideal professional development experience, teachers prioritized opportunities to receive new resources and network with other teachers above critical collaborative dialogue. These data indicate that teachers' conceptions of effective professional development may be based, in part, on a hierarchy of needs that begins with pressing needs born of limited access to instructional resources and isolation from collegial interaction with other teachers. For the purposes of this discussion, we label these undeniably important needs as "short-term" because they can, at least temporarily, be satisfied after attending several workshops and, often, with moderate personal investment.

When teachers do have needs beyond receiving materials or networking with colleagues, they did not view the EE community as a resource for achieving these more challenging goals. EE teachers did say that they wanted to improve student engagement with the material and make science relevant to students' lives. We label these as examples of "long-term" needs because they require diligent reflection on one's practice and require ongoing reflection. Additionally, such long-term needs require deep personal investment in building the trust and openness needed for dynamic collaborative critical dialogue. That our teachers did not view the EE community as a venue for addressing such needs indicates that their conception of community did not encompass both short- and long-term needs. Instead, it appears that teachers' beliefs about the benefits of community were defined, exclusively, by their most pressing needs.

Conflict and Cohesion

Changing teachers' expectations for community might require a structure that encourages teachers to enter the "discomfort zone" (Grossman et al, 2001) that is often prelude to a mature community. Herein lies a dilemma that is characteristic of voluntary, non-school based communities: in order for teachers to join, the environment needs to be cordial and friendly, but in order for teachers to remain, they need to feel invested as irreplaceable members of the community. The discomfort of collaborative critical dialogue can jeopardize the collegial environment that is essential for getting new teachers to join, but it can also help build a learning environment in which all members feel valued as unique contributors.

Though this may be characteristic of non-school based communities, different iterations of the dilemma above surely exist in other settings. Given the prevalence of contrived collegiality (Hargreaves & Dawe, 1990), or the notion that teachers are forced to participate in communities that do not address their professional needs, communities of all kinds face difficult questions regarding how to elicit genuine teacher buy-in and personal investment. To build

sustainable, effective teacher communities, facilitators need to not only satisfy teacher short-term needs but also create opportunities for meaningful dialogue about long-term needs. After all, communities built on individual goals will fade when members have satisfied their needs. We feel that the lack of conflict in the EE community contributed, in part, to teachers' association of community with short-term goals exclusively. Viewed this way, the discomfort of collaborative critical dialogue has the potential to foster more meaningful teacher interaction and investment in community.

Previous research has identified the following as sources of conflict in teacher communities: beliefs about subject matter (Grossman et al, 2001), about the proper design of professional development (Grossman et al, 2001) and about the purpose of education (Achinstein, 2002). Although the EE community did not openly confront these, or any other, sources of conflict, we believe that if EE teachers had engaged in critical reflection on their practice, conflict and discomfort would likely emerge. Our research indicates that future studies should examine the role of conflict in creating a cohesive community that is able to support teachers to address long-term needs. How does conflict encourage or discourage teacher investment in a learning community? In addition to the sources identified in the literature, are there other common sources of conflict in teacher communities? What types or sources of conflict are more likely to cause teachers to reassess their beliefs about teaching and learning?

Teacher Beliefs about Community

Although conflict may help a community to approach collaborative solutions to mutual problems, teacher beliefs about community appear to play a more fundamental, though poorly-understood, role in establishing teachers' expectations for community learning. Our research indicates that, despite the intentions of the designers, collaborative critical dialogue might not occur unless teachers view such interaction as part of their definition of community. Viewed this way, the challenge faced by the facilitator appears to be figuring out a way to encourage teachers' desire for collaborative critical dialogue. However, it seems plausible that teachers' desire for long-term change and the change-itself have a chicken-egg relationship. These findings raise important questions for future research regarding teacher beliefs about community. Does teachers' desire for more meaningful collaborative experiences function as a prerequisite for the development of an effective community? Or can community cause teachers, over time, to tacitly change their beliefs about teaching without explicit prior commitment to more substantial and long-lasting forms of professional growth?

It seems reasonable that teachers would only expect something from a learning community if they felt confident that the community was able to meet that particular need. Without prior experiences with collaborative critical dialogue, teachers might feel that asking for dynamic interactions in a community setting is akin to asking for the impossible or, at least, the unprecedented. More likely, if teachers have not had the experience of addressing long-term needs in collaborative settings, it might simply not occur to them to turn to such venues when more challenging needs arise. Often, due to the institutional prevalence of individualism and conservatism (Lortie, 2002), teachers set about solving their more-challenging needs in isolation from one another. By better understanding the factors that contribute to teacher beliefs about community, collaborative critical dialogue has the potential to become a powerful defense against the persuasion of the status quo.

Appendix A: Teacher Interview Protocol

1. Why did you decide to start working with EE?
2. How do you feel that your students best learn science broadly defined not just urban ecology?
 - Optional - What experiences do you feel like they learn the most from?
 - What strategies do you use to support them?
 - What challenges do you feel that arise in teaching them?
3. How do you feel that your students best learn urban ecology?
 - How is this similar and different from the strategies you use to teach other areas of science?
 - What challenges do you feel that arise in teaching them urban ecology?
4. Either during the school day or at school sponsored events, when do you learn about teaching?
 - What opportunities do you have to learn about teaching at your school?
 - What have you learned?
5. Imagine that you attended an excellent professional development workshop.
 - What types of things would you expect to see?
 - What was the facilitator doing?
 - What were the teachers doing?
 - Why do you consider this an excellent professional development workshop?
 - How does this compare to the majority of the professional development workshops that you have attended? How is it similar and how is it different?
6. What are some areas of your teaching that you would like to improve? It does not have to relate to EE.
 - What are some ways that EE could help you with these areas?
7. What suggestions do you have about how we can make the EE PD more useful for you?
 - Optional - Do you have suggestions for Saturday workshops? in class support? summer institute?
8. What is your definition of a teacher community?
 - What are the characteristics of a community?
9. Do you feel that EE is a community? Why or why not?
10. How has the EE community or structure changed over time?
11. Is there anything else you would like to tell me about the EE program?

Generic probes

- *You mentioned _____ . Can you tell me more about that? Can you expand on that?*
- *Why? or Why is _____ important?*

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