

How to Build a Better Online Community *Cultural Perspectives*

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Examining a “community of practice” (CoP) (Brown, Collins, & Duguid, 1989; Lave & Wenger, 1991; Wenger, 1998) is a new way of looking at how learning occurs in a social-cultural context. CoPs embody differences from other learning approaches, in that participants not only focus on improving their skills and knowledge, but also on developing their professional identities by means of participation within the community. This notion can be traced back to Dewey (1938), who viewed learning as a process of growth through which a person develops knowledge in a social context. Wenger (1998) states this notion beautifully: “Learning transforms who we are and what we can do; it is an experience of identity. It is not just an accumulation of skills and information, but a process of becoming” (p. 215) in a CoP. While exploring the implications of situativity in learning environments, Barab and Duffy (2000) echoed this when they argued that learning is “a function of being a part of a community” (p. 26) and is a process of developing a social identity as a member of the community.

To date, there have been many attempts to integrate the concept of CoPs with Internet technology (Barab, MaKinster, Moore, Cunningham, & The ILF Design Team, 2001; Bruce & Rubin, 1993; Ehman & Bonk, 2000; Riel & Fulton, 2001; Ruopp, Gal, Drayton, & Pfister, 1993). The goal of this endeavor is to provide online-accessible virtual contexts in which educators can work together across classrooms, schools, and districts to solve whatever teaching problems they might have, and also to generally facilitate their professional development (Bonk & Cunningham, 1998; Lieberman & Grolnick 1996; Grossman, Wineburg, & Woolworth, 2001; Schlager & Fusco, 2004; Schwen & Hara, 2004).

Some recently developed online CoPs have been formed around specific subject-matter issues. For example, the Inquiry Learning Forum (ILF), described in this article, the Math Forum, the Teacher Institute for Curriculum Knowledge about Integration

There have been many attempts to design online communities of practices (CoPs) as social contexts in which teachers can work together for their professional development. In practice, however, the realization of such a community is far from what is promised in theory. One of the most significant reasons for online community failures is our general lack of understanding of the potential influences of teachers’ offline cultures. Thus, this study explores the interaction of online and offline teachers’ cultures to better understand which offline cultural influences might affect teachers’ participation in the Inquiry Learning Forum (ILF), an online community of practice hosted by the Center for Research on Learning and Technology (CRLT) at a mid-western university. Using a qualitative case-study approach, data were collected by conducting document analyses, holding online and face-to-face meetings, and conducting interviews with designers, researchers, and teachers. We identified seven cultural influences that negatively affected the teachers’ rate of participation in the ILF: (1) lack of time, (2) their isolated working culture, (3) lack of reflection on their practices, (4) lack of technological support, (5) pressure from state-mandated standards, (6) pre-existing mistrust directed at the university, and (7) preferences for face-to-face interaction. These findings will inform future designers, so that they may continue to improve the utility of online CoPs for teachers’ professional development.

of Technology, and the National Writing Project are all specific subject-matter online CoPs. Others, such as TappedIn, deal with multiple subject areas. In theory, the informal online activities and services of these sites allow teachers to share ideas, build a professional culture, and encourage educational reform (Corcoran, Fuhrman, & Belcher, 2001).

However, in practice, the realization of a genuine “community” online is not as easy as it might seem from theoretical discussions of this goal. Most efforts at building online environments are not sufficient to sustain long-term teacher professional development on the Internet (Kling & Courtright, 2004; Schlager, Fusco, & Schank, 1999). It has recently become clear that simply building a Web site and then calling for teachers to participate does not necessarily lead to the development of a successful learning community. There are many complex and interrelated factors in “making” a successful online CoP, which must be examined both systematically and holistically (Banathy, 1992; Yamagata-Lynch, 2001).

One of the most significant factors that influences the building and support of an online community is the potential influences of participants’ offline cultures (Baek & Barab, 2005; Barab, MaKinster, & Scheckler, 2004; Kendall, 1999; Schwen & Hara, 2004). When we design an online space, oftentimes the main focus of the design is only the online site itself, rather than the conjunction of the site with its participants’ offline lives. In regard to this issue, Kendall (1999), after poignantly observing that “nobody lives only in cyberspace” (p. 70), strongly advised designers to consider the possible influences of participants’ offline work environments on their online interactions. In fact, teacher-participants’ offline cultures may be used constructively to contribute to the development of their online communities (Barab et al., 2004). But in order for an online space to best accommodate teachers’ professional development needs, the designer must possess an in-depth understanding of the offline cultures of the intended users as well as the actual contexts from which they interact with the site.

The purpose of this study is to explore the interaction of online and offline teachers’ cultures in order to provide data that will inform future design, so that site designers may continue to improve the utility of online CoPs as a viable venue for teachers’ professional development. Culture contains at least three main components: what people think, what they do, and the materials they use and produce (Bodley, 2005; Geertz, 1973). In this study, we define teachers’ culture as any component of the teachers’ lives that specifically affect their participation in an online community for professional development. We identified seven specific influences within the offline cultures of teachers who agreed to participate. We then compared these influences to a theoretical online culture, which is thought to be necessary for the development of a functional community within the ILF.

The Inquiry Learning Forum

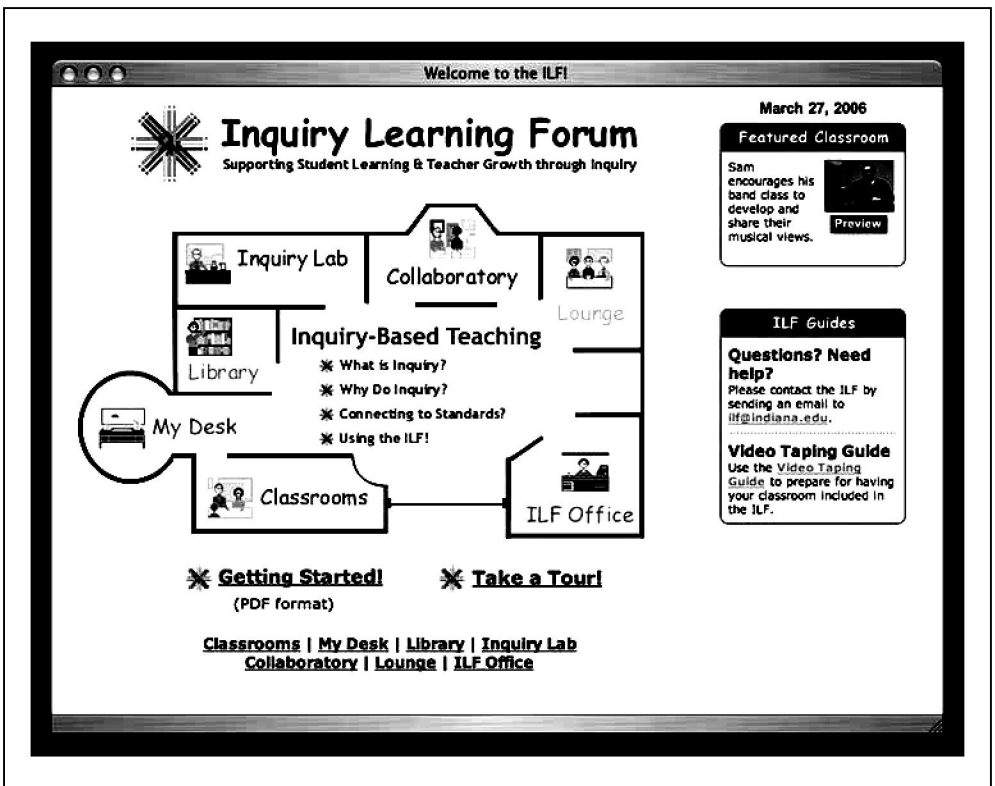
Because the ILF is the focal online community discussed in this study, a brief preliminary description of the program follows.

Primary Components of the ILF

The ILF, found at: <http://ilf.crlt.indiana.edu>, is a Web-supported CoP for teachers' professional development, funded by a National Science Foundation grant in the summer of 1999 for three years (Barab et al., 2001). It was designed by the Center for Research on Learning and Technology (CRLT) at a mid-western university with large scale teacher education programs and was inspired by the goal to "support a virtual community of in-service and pre-service mathematics and science teachers sharing, improving, and creating inquiry-based pedagogical practices" (Barab, Cunningham, Brown, Duffy, & Kling, 1999, p. 1).

Logging into the site with a participant's password accesses the home page of the ILF. As shown in Figure 1, the ILF was designed using a metaphor of a school floor plan consisting of seven main components/participant structures: Classrooms, Collaboratory, Lounge, Inquiry Lab, Library, My Desk, and ILF Office. Classrooms was formerly a primary design metaphor of the ILF. It contains video clips of contributing teachers' teaching practices. Collaboratory is another key component, which was developed to support a group of teachers—called an Inquiry Circle—who share an interest in working together. Besides the two key components above, Inquiry Lab was developed to support teachers' guided professional development in inquiry-based pedagogy in science and math. My Desk supports individual

FIGURE 1. The home page of the ILF (as of March 27, 2006).



participants' more customized or tailored ILF use. It also makes navigation easier by allowing users to bookmark Inquiry Circles and their favorite ILF discussion forums. Lounge is a public discussion area for general discussion topics; for example, Useless Math (outdated math topics) or Learning Gap (a book club). Library is the place where members can share lesson/unit plans and store other resources (as of September 2005, there were 123 lesson plans posted).

Guiding Design Principles

There have been some changes in the principles that guide the ILF design. In the grant proposal, originally there were four design principles: (1) foster virtual visitation to the classroom, (2) foster ownership and participation, (3) focus on inquiry, and (4) focus on mathematics and science in the transition grades. It should be noted that the basic principle of using a CoP was implied in the initial design and significantly influenced the ILF from its conception (Barab et al., 2001). However, the earlier emphasis was on "building" CoPs rather than "supporting" people with common purposes. Though the mathematics and science focus was not stated in the new principles, it remained a key area that the ILF continued to support. Below, the ILF team explains each of the revised principles (Duffy, Barab, Cunningham, & Kling, 1999):

- 1. Foster Virtual Visitation to the Classroom: A central strategy in the design and implementation of [the ILF] network is guided by the goal of situating the participants in the social context of the practice of other community members. An important starting point for sharing practices in a community of teachers/practitioners is to visit each other's classrooms to observe the craft of teaching as a basis for further analysis, discussion, and reflection. Live visits, however, are difficult to manage, and are fleeting, one-time experiences. Therefore, we have turned to video of classrooms as a strategy for virtually situating teachers in each other's practices. (p. 4)*
- 2. Foster Ownership and Participation: We believe that a truly effective professional development environment must be distributed throughout a community of professional practitioners of varied and wide experience and skill who will accept responsibility for building and maintaining the environment. (p. 5)*
- 3. Focus on Inquiry: Our goal is to foster inquiry, both inquiry pedagogy for the classroom and teacher inquiry into his or her practices. The focus of the ILF classrooms will be on sharing inquiry-based learning environments. (p. 7)*
- 4. Support Communities of Practice: We hope to bring together and support groups of teachers organized around some collective experience and/or curricular interest. (Barab et al., 2004, p. 59)*

Generally speaking, all of the ILF community members influenced the design process. When the ILF was conceived, a needs analysis was conducted to understand what teachers wanted in terms of challenges and needs

for their professional development. Three groups of teachers—pre-service teachers, novice teachers who have one to five-years teaching experience, and veteran teachers—were targeted in the ILF project. The results revealed that most pre-service teachers wanted to see other teachers' teaching practices and lesson plans (pre-service teachers' needs analysis Excel, 1999); in-service teachers also wanted to see other teachers' practices, but also new teaching ideas and practical tips. The project manager recalled that the needs analysis results confirmed the Visit the Classroom metaphor (personal communication, April 10, 2002). However, it was somewhat limited in that twenty-two pre-service teachers participated in the email surveys and only eight to nine in-service teachers who already had connections with the university were called.

Once the ILF was launched, three key groups were the most directly involved in the process: the ILF designers/researchers, the Participatory Advisory Board (PAB)—a teachers' group, and the Research Advisory Board (RAB)—who were external researchers. As Wenger (1998) stated, in an online learning environment in which someone is mainly taking the responsibility to design a place for someone else, neither teachers nor developers/researchers acting alone can fully design a site for teachers' learning. It requires co-development by all of them as a community of members.

Methods

To explore the complex and dynamic influences within the teachers' culture that affected their participation in the ILF, we used a qualitative case study.

The Case

The ILF was selected for this study because:

- The majority of the users of the Web site are, or can be classified as, teachers;
- The informal network of the site aims at helping its users to build an online learning community for professional development opportunities, and teachers are connected to each other in terms of their expertise and interests;
- The site has a comparatively long history; and
- Participation is on a voluntary basis and not specifically targeted to earn educational credits or other benefits.

Data Collection

Both authors participated in the data collection, but from slightly different positions. One of us was the principal investigator for the project, which entailed involvement in the entire design and research process. The other was a research assistant, who became involved in the project from its second year. We used three sources of evidence to consider both online and offline interactions between the teachers (participation): documenta-

tion, individual and focus group interviews, and online and face-to-face participant observations of meetings.

Document Analysis. As a first step in this study, the overall content and structure of the Web site was reviewed. The site’s design and development logs, newsletters, research papers written by the ILF design and research teams, and minutes of meetings were analyzed within the framework suggested above. To review meetings, we referred to meeting notes taken by another research assistant (who was hired to support the ILF researchers), and audio- and video-tapes recorded during the meetings.

Individual and Focus Group Interviews. We conducted semi-structured interviews with twelve participants (six teachers and six designers who were part of the community of the Web site, and who had participated in it either from the early stages of the design or since the launching of the site) as shown in Tables 1 and 2. The range of years of the teachers’ teaching experience was between nine and twenty-seven years.

With Human Subject approval, most of the interviews were held only one time through face-to-face meetings. However, we asked for additional comments from several interviewees after the main interviews; this was done by phone or email. Each face-to-face interview lasted approximately one and one-half hours. The face-to-face and phone interviews were audio-taped with permission from the participants and transcribed. The types of interview questions used were background questions about their site, design values and principles, design guidelines, and the functions in which they were included.

A focus group interview, including teachers, designers, and project managers, was conducted in the PAB meeting after the end of the second round of data analysis. The focus group interview had two purposes: (1) member-checking, and (2) data collection. First, we presented a brief draft of our interpretations and obtained the participants’ feedback and provocative ideas, which involved intellectual challenges and advocacy for the interpretations (Morgan, 1988). Second, the interview was used as an opportunity to draw upon their reflections, and to elicit their feelings and their further reactions (Morgan, 1988).

TABLE 1
PROFILES OF TEACHERS/PARTICIPANTS INVOLVED IN THE INTERVIEWS

| Name of Teachers | Years of Teaching | Subject | Affiliation to ILF |
|------------------|-------------------|-------------|--------------------|
| TE1 | 12 | Mathematics | PAB |
| TE2 | 19 | Mathematics | PAB |
| TE3 | 9 | Mathematics | PAB |
| TE4 | 13 | Elementary | PAB |
| TE5 | 27 | Mathematics | Collaboratory |
| TE6 | 10 | Mathematics | Collaboratory |

TABLE 2
PROFILES OF THE ILF DESIGNERS/RESEARCHERS INVOLVED IN THE INTERVIEWS

| Name of Designers | Title | Main Role |
|-------------------|------------------------|---|
| DE1 | Principal investigator | Leading role in the design and research of the project |
| DE2 | Designer | Design and development |
| DE3 | Designer | Design and development |
| DE4 | Project manager | Leading the development of the project and weekly development meetings |
| DE5 | Teacher liaison | Connecting the ILF with teachers |
| DE6 | Director of the Center | Initially attending design meetings regularly, later mainly research meetings |

Participant Observations. We participated in both online meetings and face-to-face meetings. While public spaces in the ILF could be accessed after an initial login to the site, small group work areas were accessible only with permission from the facilitator of the group. We requested permission from facilitators of three small groups. In addition, conversations on two email listservs, for the ILF designers and the ILF researchers respectively, were analyzed to study the ongoing negotiations process regarding changes in the ILF design among the ILF designers and the ILF researchers. We also attended several different face-to-face meetings held in the ILF.

Data Analysis

Data collection and data analysis were done concurrently. In the first round of data analysis, we started to code all the interview transcripts, observation field notes, and parts of recorded texts of discussion that occurred on the ILF. To do this, we used the PC version of HyperResearch 2.0.3, developed by ResearchWare. This allowed us to highlight from one word to multiple paragraphs, assigning a single or multiple codes. It was also possible to add comments to each code; these indicated relationships among the codes. Interesting or significant quotes that could be referred to later could also be added. Then we examined common patterns across the sources.

Trustworthiness. Lincoln and Guba (1985) proposed that the criteria for “trustworthiness” are credibility, transferability, dependability, and confirmability. To ensure trustworthiness, triangulation was pursued through the use of multiple sources (Merriam, 1998). We further strengthened the trustworthiness of the findings by using peer examination, member checks, and the disclosure of researcher bias. Peer review involved working with the ILF developers to discuss emergent findings (Lincoln & Guba, 1985; Merriam, 1998). Member-checking was conducted in three different ways: by email, class presentations, and focus group interviews. First, member checks involved submitting transcripts of interviews and observations by email to the participants to ensure accuracy. All materials were sent back to the inter-

viewees for review; their feedback was used to make negotiated adjustments and conclusions. Second, a summary of findings of the study was presented in two class presentations, which four of the ILF designers attended. Lastly, the findings and interpretations were presented in the focus group interviews.

Discussion of Findings

There were seven recurring cultural themes in the data, which were linked to the teachers' participation (or lack thereof) in the ILF: (1) lack of time, (2) their isolated working culture, (3) lack of reflection on their practices, (4) lack of technological support, (5) pressure from state-mandated standards, (6) pre-existing mistrust directed at the university, and (7) preferences for face-to-face interaction.

Proposition 1: Lack of Time: *While supporting the ILF in principle, teachers were not generally able to “make” time to actively participate in the ILF.*

The issue of lack of time was mentioned by the teachers in their interviews, and in the design and research meetings. Even though the teachers valued opportunities to be engaged in deep discussions with other teachers

TABLE 3
CULTURAL THEMES THAT INFLUENCED DESIGN DUALITIES

| Cultural Themes (Propositions) | Findings |
|--|--|
| Lack of time | <ul style="list-style-type: none"> • Preparations for the next day's class • Grading, administrative work • 15 minutes is the longest break-time in between classes • Long download time |
| Isolated working culture (Self-sufficiency) | <ul style="list-style-type: none"> • Teachers manage their own classes in terms of unit/lesson plan preparation, teaching, evaluations |
| Lack of reflection on their practices | <ul style="list-style-type: none"> • Does not happen often • Is usually in the back of their minds rather than expressed explicitly and publicly |
| Lack of technological support | <ul style="list-style-type: none"> • No access to computers and the Internet at their convenience • Problems with watching videos • Freezing videos • Difficulty with navigation |
| Pressure from state-mandated standards | <ul style="list-style-type: none"> • Pressure from PL 221 • Standardized tests • Strengthen teachers' accountability |
| Pre-existing mistrust directed at the university | <ul style="list-style-type: none"> • Poor relationship between teachers and schools and university |
| Preferences for face-to-face interactions | <ul style="list-style-type: none"> • Human touch, smiles • Personal • Technology still strange |

and the ILF community members, and valued sharing resources in regard to inquiry-based pedagogy, lack of time was an obstacle to their participation. TE2's comments below, offered during her interview, capture this recurring theme.

I think the ILF is a great resource to use...The problem with it is [that] teachers don't have access to the Internet for the period of time which they need to have long-term discussions. It's going to be a 15-20 minute time block that they have during the day, which they can spend learning on the Internet...in this forum. And I see the problem there. But I like the focus to help teachers have a place to communicate back and forth over the Internet. (Personal communication, May 30, 2002)

Teachers were not alone in pointing out this time issue. All the ILF developers acknowledged the time issue as the key to teachers' participation. DE6 described how busy teachers are, using his wife as an example:

My wife works, and she gets up at 6:00 in the morning. If she still has some schoolwork to do, she finishes it up real quick. She's at school by 8 AM; school starts at 9. She gets this organized and that organized, and she's in the classroom during lunch. At 3:30, she finishes up in the room, gets home about 6, we have dinner, [and] she's grading papers until around 10. (Personal communication, April 27, 2002)

The teachers' daily schedules are "crammed" with a wide range of tasks, for example: the development of classroom activities and handouts for the coming day, grading student work, meetings with parents when there is a concern about a child, meetings with other teachers, and other administrative tasks. In TE4's case, as a technology coordinator, she was constantly in the computer lab fixing technology problems, or answering questions, and also locating resources for teachers. Teachers had to give up some of their other commitments to participate in the ILF.

Proposition 1 is congruent with what Murphy (1997) reported. Murphy found from his experience in leading Whole Faculty Study Groups that the biggest challenge in teachers' professional development is "no time" to do extra things beyond their routine work. As teachers' online participation for their professional development could be an extra burden to them if they already have a long list of daily responsibilities, "making" time becomes an imperative condition for teachers' online participation. Thus it is important to design and support online activities that are not only built around teachers' daily tasks but are also directly relevant to them, so that their online participation benefits their daily work.

Proposition 2: Isolation/Self-Sufficiency: *Teachers predominantly work independently and self-sufficiently in their schools. Therefore, they were not very comfortable and accepting of the collaborative concepts in the ILF.*

Both the teachers and the ILF designers who had teaching experience reported that teachers usually work individually and self-sufficiently. This

varied somewhat, depending on the grade-level they taught. The interviewees said that a single teacher usually teaches a class and looks after his students behind a closed classroom door.

The observation Proposition 2 agrees closely with the study of Lieberman and Grolnick (1996). They contend that most educators in school organizations are expected to be “self-sufficient” in their classrooms (Lieberman & Grolnick, 1996, p. 4). This contributes to an isolated working style for teachers (Fullan, 1993). Thus, the shift from working independently to interdependently requires a supporting social structure and is an unfamiliar process for many teachers.

However, several of teachers in the interviews worked with other teachers for some purposes. For example, TE2 and TE6 provided technical support when other teachers asked for their help. Also, TE2 did team-teaching with one of her colleagues. They regularly met, prepared teaching materials together, and shared feedback. Perhaps the elementary school context put her in a better position to team-teach. However, this experience was not typical.

In the third round of the member-checking, TE5 mentioned that teachers visit other teachers’ classrooms on special occasions like mentoring, but “It is not the norm to go to other classrooms and [observe] what other teachers are teaching. We just pass by the door” (personal communication, July 6, 2002). However, teachers do initially work collaboratively with other experienced teachers.

If this is a typical phenomenon in schools, even where teachers regularly meet, it should not be simply expected that teachers will rely on other teachers to learn in an online setting. Perhaps various activities to build social relationships and intimacy—what Preece (2000) called sociability—can contribute to and enhance a collaborative learning climate. It is important that teachers should have many opportunities to collaboratively develop lesson plans, team-teach, and solve problems with their colleagues in their school. The provision or facilitation of an arena of joint enterprise could support teachers in their efforts to learn together.

Proposition 3: Reflection: *Teachers rarely “reflect” on their teaching practice, especially in collaboration with other teachers.*

This cultural theme was reported by both teachers and the ILF designers. During the interviews, the teachers said that they do reflect on their teaching practice, but this was not a substantial part of their daily work. If practiced, it was done individually and informally. TE2 said that she reflects on her teaching in the back of her mind, rather than setting a time with colleagues to discuss these issues together. DE3, who had student-teaching experience, explained this as being due to the individualistic nature of teaching:

[T]eaching is a very personal endeavor...if we were construction workers, it’s relatively easy for another construction worker to say “hey look—you’re doing that wrong. It’s much easier if you take and lay the wall down on the floor, put the framing together and then stand the wall up, rather than trying to build the wall as its going to be when it

gets finished.” In teaching, if we tell you, “look, you did this today, but it would work much better if you took Johnny and sat him in the back of the room and had this student and this student work with him,” you take that much more personally. Teaching is part of who we are as a person. (Personal communication, April 21, 2002)

These comments reflect a commonly held perception that teaching is a personal, private, and individualistic activity (Little, 1990). This is also congruent with what Lampert (1998) stated:

More common in teaching is the individual practitioner, who reasons privately about what is good, right, and true, often while fending off the barrage of pedagogical solutions that are promoted by teacher educators, policymakers, curriculum developers, researchers, and administrators. The image is one of insiders, who do teaching, and outsiders, who believe they know something that teachers should know and do. (p. 54)

DE5, the teacher liaison who had a teaching background, also raised the questions, “How often do we exchange critical dialogue in face-to-face situations? Do we do that everyday?” This implies that teachers usually do not have many opportunities to engage in reflection on their own or on other teachers’ teaching.

As a cause for this lack of “reflection-in-action,” which links together knowing and doing in the practice (Schön, 1983, p. 49), TE3 cited lack of time, and TE5 explained that “there is no structure to force teachers to reflect. Some teachers could do it naturally or by conscious decision” (personal communication, July 6, 2002).

When this issue is considered in the context of online environments, the lack of reflection seemed to become more salient. Teachers’ messages posted on the ILF tended to be superficial and lacked critical reflection. DE4 noted, “Now [teachers] try doing [reflection] with a peer. They don’t do it in real life with a colleague that they work with. Why the heck do we think they’re going to do it online?...Inquiry is not part of their culture” (personal communication, May 18, 2002). As a foundation for online reflection, teachers need to be encouraged to actively engage in reflections on their teaching practice with other teachers in their school environment.

In an online environment, it is therefore necessary to help teachers build trust among themselves in their collaborative community. With this as a model of useful behavior, the teachers may then seek to extend that online sense of trust to their offline environments. One way to do this is to instill a constructive criticism protocol into the participants’ responses to one another’s ideas. This would allow the teachers to share their thoughts and suggestions in a helpful (rather than a criticizing) way, which would in turn allow them to regard teaching methods more objectively—as a communal pool of knowledge, instead of as “personal” and “sensitive” reflections of their own personalities.

Proposition 4: Technological Support and Access: *The technological problems of the ILF were major barriers to participation for a group with limited technological access and related expertise.*

This observation captures what teachers and the ILF designers recognized as a significant challenge. A lack of technical competency to use the site and having limited access to the Internet are more than mere logistical problems when communication is primarily conducted online (Ruoppe et al., 1993). Even when the teachers worked as professional technology supporting personnel or had a “high computer competency,” some ILF activities—especially watching videos, caused them technological problems.

The level of frustration was quite high. They had problems with freezing screens while using videos, resolution differences, difficulty downloading the video player, and navigation dilemmas. For example: TE1 and DE1 pointed out that in the earlier ILF design, the overall information structure was relatively simple and usable. However, as the community grew, the designers tried to add more functionality with the hope of better meeting teachers’ needs. This made the site more complex and difficult to use. The added new features and frequent changes in the design of the ILF caused the teachers to experience frustration in their use of the ILF.

It took time for the teachers to become familiar with the current state of the ILF system. Once they got to know it, it was frustrating for them to log in and find that it had changed. TE2 got stuck at one point, and could not figure out how to proceed:

It was still hard to navigate. I felt I needed more direction in terms of “if you’re looking for this, go here.” You know, that kind of thing. I wasn’t even sure how to get off the front end and go somewhere. Oftentimes, when you would open the site, there were some new changes, what’s been newly added. I was not sure where I should go, or what had been changed. (Personal communication, April, 2002)

This statement is telling, considering that this individual claimed to be a teacher to whom other teachers in her school brought technical problems, and she provided answers to them. Also, more importantly, she had been a PAB member from the beginning of the ILF. Again, these difficulties caused by the frequent changes affected the pre-service teachers. In regard to this, DE2 shared his observations concerning his class in September 2001:

My students were quite ambivalent toward the new front screen. First, they were kind of annoyed that it had changed, because they had just really figured out the ILF. There is so much in the ILF, they still are having difficulty just figuring out where they are and where they have to be.

Accessibility to computers was another problem. TE2 did not have a computer at school in mid-2001, and TE1 did not have one at home. According to TE5, computers had only recently become available in each

classroom; usually computers were in labs behind locked doors. Obviously, the ILF was simply not accessible to many participants, because the main communication channel of the ILF was the Internet. Ideally, technology support needs to be available anytime, anywhere that teachers want to use the Internet for their professional development. In addition, and more fundamentally, teachers need to have easy access to computers connected to the Internet in both their schools and their homes.

Proposition 5: Public Law (PL) 221, State-Mandated Standards: *The teachers were quite concerned about external requirements such as PL 221. The ILF advocacy for state standards was viewed as a distraction by some teachers and as an incentive by others. The less-confident teachers saw the ILF as a distraction; the more confident teachers saw the ILF as a resource. The net gain for the advocacy of state standards was offset by the anxiety of less confident teachers.*

Teachers participating in the interviews had mixed feelings about the effects of PL 221, which mandates that teachers must develop lessons according to state-mandated standards (which strengthens the accountability of schools as well as teachers), even on the ILF. On the one hand, teachers thought these external pressures hampered teacher participation in the ILF. TE3 indirectly described the situation, saying “if you knew some of the stuff that was going on within the state with teacher assessments and students and things like that, the ILF has been so successful.” This implies how much teachers are pressed by these external factors in their everyday work. Additionally, some of the teachers commented that state-mandated standards and standard tests drove teachers to focus on test scores, which would lead teachers away from experimenting with innovative approaches—for example, the inquiry-based pedagogy that the ILF primarily supported.

On the other hand, some teachers felt that if the ILF could support PL 221, “everybody will take it.” The implication was that if the ILF activities were relevant to teachers meeting state standards, then those external requirements would contribute to increased teacher participation in the ILF. This is also related to CT1, which is the lack of time issue. External pressure and mandates could increase the time constraints for teachers. When online community activities are viewed as an extra burden, it is difficult to expect teachers’ active engagement. Teachers need to see directly how and why they can benefit from their participation in online community activities.

Proposition 6: Pre-existing Mistrust and Lack of a Relationship with Teachers: *The ILF designers assumed the prior history of the university (as a partner with public schools) worked against the acceptance of the ILF. In their view, the large state-supported university did not have an attractive image with the teachers and administrators they sought to serve.*

This observation was raised by the designers rather than by the teachers. For example, DE2 and DE3, who worked most closely with the teachers in their pre-service teachers’ course, related their student-teaching experiences. They both observed a pre-existing mistrust from teachers and schools directed at the university. DE3 described some problems regarding university research projects and student teaching:

Most teachers in this area distrust [this university]....We've been a very bad neighbor. We would do research projects and then we would go away and not come back. We graduate 600 teachers a year and we have to place 600 teachers. And teachers just get tired of dealing with the University every semester. So anytime you say you're associated with the University, you're going to get a little bit of negative feedback, because the teachers have been dealing with the University for a while now. They're kind of tired of it. (Personal communication, April 21, 2002)

DE3 also commented about the same issue that DE2 had raised and added that this poor history was an obstacle for the ILF developers, who wanted to have more teachers involved in the designing process and at the ILF site.

Historically, the university has a poor history of working with teachers in the area. Teachers have been frustrated with student teachers that we sent them because we're so big, and I think we do a relatively poor job in undergraduate education. Maybe they are frustrated with the way that the university comes out and asks for things, wants things, wants to do research, and then walks away and doesn't give back to the schools or the teachers in a way that's meaningful. And I think that not having a network of teachers that the school has been interacting with and working with over a number of years has really limited our ability to get people involved. (Personal communication, April 21, 2002)

The School of Education in the university needs to provide as many opportunities as possible for K-12 schools and teachers to engage in dialogue, so that the university people will understand the current situations of schools and teachers, and also how university research and school practices could mutually contribute to each other. They are partners in the same boat and must work together for improvement in education. Design teams should start from the fundamental understanding that an online community is a part of the educational community as a whole. Its activities should therefore be aligned with its target institutes in the larger community (Wenger, 1998). To achieve this, greater communication and collaboration in the offline environment is a necessary pre-requisite.

Proposition 7: Strong Tradition of Face-to-Face Interactions: *Communication technology has permeated everyday professional life, but it is still strange to many teachers.*

In most teaching, there is a strong tradition of human interaction. The job is characterized by personal, face-to-face communications with students. Because of this, the teachers expressed that the human touch is important in their work and that they felt most comfortable with face-to-face interactions, in which they could look at their communication partners' eyes and facial expressions. DE5 contrasted the public schools with the university in terms of email use:

The use of online communication, especially email, is taken for granted by university folks, which seems to be very different from the situation of most teachers. If teachers have anything that they want to ask, they go to the next classroom. It is characteristic of the university culture that, even though I am right next to DE4, I use email to say, “Hi, how are you?” (Personal communication, April 5, 2002)

Through My Profile, the ILF teachers could at least know the names of teachers they were talking with; but they still said that, when you have never met the person before, it is hard to have a real sense of who you are talking with. Thus, the identities described in My Profile seemed to amount to little more than so many “pseudo-anonymities.”

In the PAB meeting in 2000, TE4 suggested that, “The warm body is useful. Set up workshops, staff development, etc. I think the warm body idea is a great one.” This warm body idea was again raised in the PAB meeting in 2002. TE1 proposed that supplementing the ILF online interaction with face-to-face meetings was a good idea: “[Five to seven] days in the summertime was good for face-to-face discussions/workshops. It was 9-2, 9-3—something like that” (personal communication, May 15, 2002). DE6 agreed with TE1:

Anytime and anywhere probably needs to start with some sort of face-to-face meeting, based on your experience. I think we learned that too, over the years. We started with the idea that if we had these great resources, people would come and see the Web site, would come back again and again, exchange meaningful dialogue, and contribute lessons. A little of it happened, but not as much as we hoped. (Personal communication, April 27, 2002)

In response to this cultural theme, sufficient face-to-face opportunities need to be devised to allow teachers to have that “human touch” with other teachers in online environments.

Conclusions and Implications

This study reminds us of the importance of understanding teachers’ offline cultures when attempting to design online learning environments for their professional development. We have identified seven offline cultural themes that significantly influenced teachers’ participation in the ILF. We have also found that there were significant disparities between the teachers’ offline cultures and the presumed, necessary culture for an online community.

When we design a learning environment (an intervention), it is very important to first understand the social and cultural contexts of the people for whom that environment is designed. No matter how legitimate and inspirational the premise of an online environment may be, it might not be very effective or useful, if it is not designed to be compatible with the offline

lives of its targeted users. Building a CoP takes more than just an aspiration. It needs to address a long-term educational reform agenda while it supports short-term teachers' daily needs and learning interests to make more effective and efficient use of the teachers' limited and valuable time.

It requires bringing participant-voices into the design to build an easy-to-use communication space, and supporting social interactions and structures. A CoP needs to be simple enough that participants can easily use it, but complex enough so it can function to serve participants' needs. Also the site needs to help participants to build a sense of community and trust while working in a more private community place.

Also, designers need to put more effort into suitably aligning the direction of the CoP with those of other, larger communities. Typically a CoP is a self-contained social-technical system, but it is dynamically interrelated with many other outer-systems or communities that are closely related to teachers' professional development (this is in fact a main goal of the ILF). The boundary surrounding the CoP needs to be flexible enough to respond to changes in educational policies and systems, yet stable enough that users may focus on their own practices. It is important to align the direction of the ILF to those of larger communities that influence teachers' practices.

The culture and the trust between the participants and the designers are underlying layers that influenced the negotiation processes. Acknowledging these cultural themes furthers our understanding not only of challenges that the CoP participants encountered, but also of the opportunities that an online community can offer as a tool for professional development.

We conclude our paper with the following areas or topics that require further attention. How community learning opportunities affect participants' practice, and their learning and performance, is one interesting area for future investigation. Knowledge of precisely which aspects of the participants' involvement in an online community contribute to the greatest results can be used as a foundation for research on design or facilitation guidelines. Related to this, one of the recurring issues in this study was what success indicators existed for the site, and how one might measure these. If a project were to be funded like the ILF, the issue of showing these influences of the project on participants' practices to the funder becomes more significant.

The study of when and how the community norms and the sense of community emerge, and how these evolve is also important to understanding community life. Community life stories might be useful for developing "community-indicators," so that researchers will be able to understand when there is a viable community on a site. Additionally, another interesting research topic would be how participants transform their identities. For example, how do pre-service teachers move from a peripheral stage to a center-stage position while working with peers and in-service teachers (of different cultures/statuses)?

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