

Sustaining an Online Community of Practice: A Case Study

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Abstract

The difficulties inherent in trying to pursue face to face professional development opportunities have traditionally made it difficult for teachers to access professional learning. Today, given the proper communication tools, teachers can become involved in meaningful professional learning without the restrictions imposed by time and place. This paper examines findings from the analysis of a group of educators who were engaged in professional development through the use of an electronic network for over a decade. Findings from the study will be examined to unearth the challenges in developing and sustaining online communities of practice to support professional learning.

Résumé

Les difficultés inhérentes aux formations en face à face traditionnelles ont rendu ardu l'accès des enseignants en exercice à la formation professionnelle continue. Aujourd'hui, avec les outils de communication appropriés, les enseignants peuvent s'impliquer dans une formation professionnelle significative sans les contraintes du temps et de la distance. Cet article examine les résultats d'une analyse des activités d'un groupe d'éducateurs impliqués dans du développement professionnel à l'aide d'un réseau électronique depuis une décennie. Les résultats nous amènent à découvrir les défis dans le développement et l'entretien de communautés de pratique en ligne soutenant l'apprentissage.

Introduction

Teachers have traditionally found professional development opportunities difficult to pursue for reasons which have included constraints created by time, accessibility and relevance. Presently, as a result of the growth of technological innovation, alternatives to traditional models of professional learning are being explored. Specifically, information and communication technologies have encouraged the creation of rich online environments where participants can share professional strategies, examples of best practice, and professional development opportunities. Riel and Polin (2004) view the networked environment as one that had the potential to revolutionize education by expanding the reach of the classroom teacher to include

researchers and teachers in an effort to “more effectively evolve practice through collaborative re-conceptualizing of learning practices” (p. 46).

This paper summarizes findings from a case study of an online network, The Education Network of Ontario/le Réseau éducatif de l'Ontario (1993-2005), and reports the challenges of maintaining online communities of practice for professional learning. The supposition that teachers who use online networks can potentially become involved in meaningful professional learning and translate that learning into the classroom formed the basis of the study. While research into the use of online communities of practice for professional development is emergent (Barab, Kling and Gray, 2004; Preece and Maloney-Krichmar, 2003; Nonnecke and Preece, 2001; Maloney-Krichmar, Abras, and Preece, 2002; Zhao & Rop, 2001), this study focused on the need, as noted by Gray & Tatar (2004), to discover how teachers used skills acquired through involvement in online communities in their classrooms.

This paper is based on findings from an online community that grew exponentially in the early 1990s, and then witnessed diminishing participation in spite of improvements in technology and other supportive efforts. The paper addresses some of the concerns raised by researchers regarding online communities: a) the need for research into online networks that have been in existence over a long period of time (Smith, 1999); b) the semantics around the use of the term 'community' in defining such networks; c) the complexity of the social dynamic of networks (Preece, 2004); and d) the effect of information overload on participation in such communities (Cavanaugh, 2004).

Literature Review

The term 'community', with regards to online networks, has sparked much discussion (Preece & Maloney-Krichmar, 2003). According to de Souza and Preece (2004) there is no consensus regarding a definition for an online community, while Kling and Courtright (2004) suggest that “the casual use of the term community to characterize groups that are engaged in learning or groups that participate in e-forums, is seriously misguided” (p. 91). Nevertheless, in an effort to establish criteria for an online community, Preece, Abras and Maloney-Krichmar (2004) maintained they have “a purpose, are supported by technology, and are guided by policies” (p. 2), while Gray (2004) observed that they exist when members see value in participation, create some shared history, and develop a way to welcome and mentor newcomers. According to Preece (2004) certain practices appear to harbour online community development. Preece maintains that an awareness of etiquette in an online community is pivotal as it creates “stepping stones to trust and social capital development” (p. 2). Also, communities need to be cemented by social

capital which can be divided into bonding capital: the shared values of the online communities, as well as bridging capital: the artifacts that can be shared between community members.

Barriers to participation in online networks include lack of access and time coupled with technical difficulties.

Leading and managing an online community requires time; participating in an online community requires time. Given all of the demands made of educators participation in online communities should not be seen as another imposition, another task to be completed at the end of an overstretched day... (Cuthell, 2004, p.9)

Cuthell also notes that 'top down' initiatives, where teachers are expected to participate in online networks with little input from the teachers themselves, result in negative 'trolls' (unhappy participants with negative attitudes and comments) who hijack online discussions. Maloney-Krichmar, Abras and Preece (2002) argued that participants who encounter technical difficulties fail to participate, as do those who feel there is no sense of community or belonging.

Wenger (1998) and Barab, MaKinster & Scheckler (2004) noted that competing dualities must be taken into consideration within the dynamics of an online community. Participants face conflicting dualities as they negotiate meaning in the online community which may adversely affect active participation. Lack of active participation can be highly problematic and it was widely held, until recently, that peripheral participants or 'lurkers' were a detriment. Some recent studies have examined more closely the benefits of both active participation and peripheral participation. These studies concluded that in many online communities 'lurking' is the 'norm' and only a few members post regularly (Sutton, 2001; Preece, Nonnecke and Andrews, 2004). Lurking becomes a threat when too many members choose to lurk rather than post messages actively.

A final factor influencing the sustainability of online communities may be the effect of the exponential growth in information delivered through technology. According to Wellman (2005), the use of e-mail has increased professional workloads: "...those who use email report 183 discussions per month, 54% more than the 119 discussions for those who do not use email. The result is that the more email, the more overall communication" (p. 4). Cavanaugh (2004) found that North Americans had witnessed a 13% increase in e-mail since 2002 with an additional 41% increase in spam and unwanted email. This increase has resulted in the need for many employees to check emails at home and on weekends to keep up. It is therefore not surprising to find that some researchers believe there are signs that people are experiencing what Kirsh (2000) termed "cognitive

overload": "The upshot is a workspace of increased complexity, saturated with multi-tasking, interruption, and profound information overload ..." (p. 2). Two studies, one conducted in 1998 by Whittaker, Terveen, Hill and Cherny, and another conducted in 2002 by Jones, Ravid and Rafaeli, examined the concept of overload in online newsgroups and noted that excessively lengthy messages can lead to a lack of participation.

The following section details the research context and methodology involved in the exploration of the online community of ENO/REO.

Research Context and Methodology

In 1993, the Ministry of Education of Ontario and the Ontario Teachers' Federation provided funding for the creation of The Education Network of Ontario/Le Réseau éducatif de l'Ontario (ENO/REO) with two overriding objectives:

- a) to ensure that all teachers in Ontario had free access to the Internet as well as to each other, and
- b) to encourage the development of skills in the area of information and communication technology with the ultimate goal of using those skills in the classroom.

Over the course of a decade, ENO/REO provided the assistance one would associate with an Internet service provider (i.e. electronic mail access and web space), while also providing online curriculum support, project initiatives, online discussion forums, and professional development opportunities. Members accessed the ENO/REO website to find resources and online discussion forums addressing a variety of educational concerns. They also took part in online projects where much of the communication between project coordinators and participants was completed through e-mail or discussion forums.

To investigate ENO/REO, an instrumental case study was used both as a "process and a product" of inquiry involving a longitudinal analysis of the participation of two groups of teachers (Stake, 2000). The first group of eight teachers (Group 1) were involved with ENO/REO between 1993 and 2003. The larger part of the study was devoted to these teachers as their longevity and their "electronic footprints" were pivotal in creating an understanding of the way in which an electronic community changes and grows. The second group of four teachers (Group 2) were involved from 1999 to 2003. Their perceptions were compared with those of Group 1, and focused on changes in:

- working conditions, and
- technological tool development since 1993.

The need for an analysis of the two groups of teachers was based on a strong assumption that those who had joined ENO/REO in the past may have had very different experiences than those joining later. The two data groups complemented each other by suggesting ways in which online networks grow and change, and how those changes may affect participation and professional development.

An ethnographic approach was chosen because it allowed the participants to be studied in their natural environment - the discussion forum. The choice of methodology was influenced by several key researchers involved in the study of online communities of practice (Stacey, 1999; Thomsen, Straubhaar, & Bolyard, 1998; Jensen, 2002; Paccagnella, 1997). This approach fits the parameters established by Hammersley, (1990) as a study of behaviour in a situated group of people in their day-to-day interactions. The complexities involved in the adoption of technology, through the interaction of participants in an online network, as proposed by Barab, Schatz and Scheckler (2004), suggested that interrogation of the data needed complementary perspectives. An understanding of the way in which the *system* of ENO/REO worked was needed in order to determine how ENO/REO had supported participants within the online environment. This was examined through the broad perspective of Activity Theory (Gray & Tatar, 2004, Barab, Schatz & Scheckler, 2004).

Engestrom (1987) proposed four critical criteria for examining activity:

- Activity must be pictured in its simplest, genetically-original structural form.
- Activity must be analyzable in its dynamics and transformations, in its evolution and historical change.
- Activity must be analyzable as a contextual or ecological phenomenon. The models will have to concentrate on systemic relations between the individual and the outside world.
- Human activity must be analyzable as a culturally mediated phenomenon (p. 7).

Beyond an assessment of the various layers of activity involved in the online environment of ENO/REO, a narrower perspective was needed to focus on the adoption practices of the individual participants. This perspective was examined through the criteria determined by Rogers (1983) and provided a basis for examining the adoption practices of the individuals in both data groups within the context of Activity Theory. Rogers noted that individuals move through a specific process before adopting an innovation and it was of interest to this research to determine this process in both data groups.

Group 1 participants, who had been part of ENO/REO since its inception, had adopted the online environment in its infancy; Group 2 participants, with only 2-4 years of involvement, had adopted the environment later in ENO/REO's development. Rogers outlines several criteria that influence whether or not an individual will adopt an innovation. These criteria include: the relative advantage of the innovation to the individual; the compatibility of the innovation with personal values; the complexity of the innovation; the trialability (Jebeile, Khadra and Reeve, 2002 p.1665) of the innovation; and, finally, the manner in which the individual can observe positive results from adopting the innovation.

The study resulted in an examination of the community rules and the way in which labour was shared within both ENO/REO and the school system, and a study of the technological and social tools used to attain the skills necessary to reach the final goal of integrating technology in the classroom. The tensions and contradictions within the community were investigated through the multiple voices of the participants, through the textual archives uncovered in the discussion forums, and through initial surveys. The socio-cultural histories of the participants were examined to understand the expansive transformations that have taken place over a decade of participation. A model developed and applied to this study, and the interaction of its components is shown in diagrammatic form in the results section (see figure 1).

Data Gathering Methods

Case study data were gathered from:

- An initial online questionnaire completed by each participant which provided background information.
- An initial semi-structured interview.
- Following Interview 1, the transcripts were analyzed and coded using Nvivo (a qualitative software package which is used to code and analyze qualitative data).
- Online archived messages were analyzed and coded using NVivo.
- Transcripts of Interview 1, combined with transcripts of the archived messages were then shared with participants through e-mail to prepare for the second interview.
- Interview 2 was based on questions meant to deepen participants' recall by elaborating on Interview 1 and comparing inferences from the archived messages.

This choice of data collection addressed what Rogers (1983) referred to as the "weakness of diffusion research..." where much of the data

collected would be “recall data” and where the participants might have only dim recollections about their initial involvement with an innovation (p.113). These weaknesses were addressed by approaching the participants through an initial questionnaire combining two semi-structured interviews with an analysis of their messages over time.

The study used a small sample of participants, in a deliberate attempt to create the 'thick' descriptions considered necessary for the research. It was also based on practical considerations given the need to search archived messages over a ten-year period. The amount of data that could potentially be generated with a much larger sample was a concern.

Description of Participants

The participants in Group 1 represented seven different geographic locations covering urban as well as rural areas across the province of Ontario. Participants had all been teachers over the course of their involvement with ENO/REO; at the time of writing they included three administrators (one male superintendent, one female principal, and one male vice-principal), a recently retired female computer consultant, one male Department Head from the secondary system (grades nine to twelve), a female School Board computer consultant, and two elementary (K- 8) classroom teachers (one male, one female).

The participants in Group 2 included two classroom teachers (one male, one female) and two teacher librarians (one male, one female) who had all joined ENO/REO after 1999.

Data Analysis

The analysis of the data was framed around a process described by Janesick (2000) where 'methodolatry' (an obsession with methods) was avoided and the researcher focused instead on the “substance of the findings” (p. 390). The 'substance of the findings' was gleaned from the transcripts of 24 interviews as well as the text messages found in the archives of online discussion forums. A review of the literature suggested several approaches to the analysis of the content contained in the data but it was Kvale's (1996) overview of the study of texts which helped create a framework for the examination of the interview transcripts. He suggested transcripts should be examined using a “hermeneutical circle” (p.47) focusing on interpretation, reflection and reinterpretation.

After analysing the messages found in the discussion forums, the participants' perceptions were added to the analysis to avoid 'surface inferences' (Rourke et al., 2001). This triangulation addressed the potential of misinterpretation by the researcher.

Units of Analysis

A choice was made to analyze 'units of meaning' in their entirety without including other participants' references, taking into account a choice between studying online interactions using whole conversations (Thomsen et al., 1998; Blanchette, 2001), or analyzing individual messages (Smith 1999; Bullen, 1998; Rourke et al., 2001; McKenzie & Murphy, 2000). There was also a concern that the number of messages contained in the study had the potential to become unmanageable, as some of the participants in Group 1 had been part of ENO/REO for a long time and their electronic archives might prove overwhelming. The messages were therefore captured over a continuum, a strategy previously demonstrated by Stacey and Gerbic, (2003). They suggested analyzing messages by using a "sequence of analysis points...which are representational points in the development of online interaction" (p.2). Messages in this study were then interrogated at representational points over the years the participants were involved in ENO/REO.

Coding

The choice of coding was based on recent studies involving analysis of online discussion forums. Schlager, Fusco, & Schank (2002) deliberately chose only seven categories of discourse to reduce the problem of unmanageable coding categories while Rourke et al. (2001, p. 4) suggested devising "a protocol for identifying and categorizing the target 'variables'...". This led to the creation of categories framed around the questions used in exploring the theoretical frameworks.

Results and Discussion

This section of the paper focuses on the results gathered from both data groups through the Activity Theory framework, as depicted in Figure 1 below, and identifies the challenges inherent in the sustainability of the community of ENO/REO. The overarching question of the effect that involvement in The Education Network of Ontario had on classroom practice, and on the use of information technology in particular, was answered using sub-questions framed through the Activity Theory units of analysis that are listed with each section of the results.

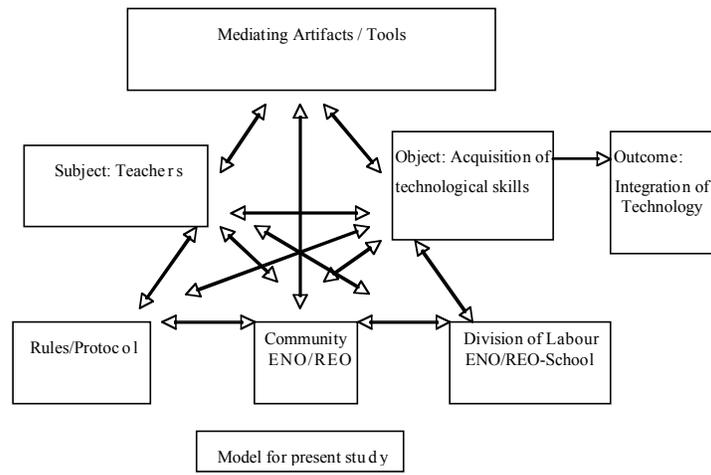


Figure 1. Graphical representation of the interrelated units under study

1. *Subjects/Participants.* Who were they (identities, pedagogy and philosophy of education)? Why and how had they joined? How compatible was ENO/REO with their “values, past experiences and needs...”?

The twelve participants were constructivist leader/educators with an interest in innovation. It appeared that when ENO/REO was first initiated, the energy and excitement it generated through a very intensive marketing campaign, had encouraged participation simply as a reaction to this innovative attempt to communicate with colleagues across time and space. Interestingly, previous experiences with technology had no effect on the level of involvement of participants after initial experimentation.

Participants also noted that face-to-face training sessions in the early years helped them bond with colleagues and thus cope more easily with the early technological challenges of the community. This kind of bonding raises questions about successful online community building interspersed with face-to-face meetings.

After the initial excitement generated by ENO/REO in the early 1990s, participants who joined later, did so for more specific reasons. The participants in Group 2 had joined ENO/REO to take online courses, or had been mentored into becoming part of the system rather than being attracted by a novelty. It is worth noting that ENO/REO was no longer considered an exciting alternative by Group 2 participants and that online communication had become almost commonplace.

2. *ENO/REO as a community.* What were the rules and protocols developed to support ENO/REO? What was the 'relative advantage' of ENO/REO to the participants? What tensions existed?

The analyzed data indicated participants in Group 1 believed they were part of a community when ENO/REO was first created. They reported it was important to them to keep connected to the community and noted being quite disconcerted when they were cut off from the service due to technical difficulties. They had all experienced technological barriers to participation, and four initially left the community as a result of their frustrations, but all eventually returned reporting a strong emotional commitment to ENO/REO.

After the initial excitement generated in the early 1990s participants who joined ENO/REO later, did so for other reasons. Participants in Group 2 had joined to take online courses, or to take part in online projects and had consequently been encouraged to join the public online discussion forums. They reported a more intimidating experience than those in Group 1 when it came to joining the larger public forums. Rules and norms seemed rigid, and the etiquette and trust needed to support new members appeared to be missing. As a result, participants reported they were initially reluctant to post as negative reactions by some older network members did not encourage participation. Unwritten rules regarding established online etiquette confused new participants leaving them with less of a 'sense of community' than those in Group 1. One participant referred to what he perceived as an 'old boys club' atmosphere in some of the forums and noted certain forums seemed to 'cater' to a small group of people where the discussions became repetitive with few new contributions. It became clear the friendly bonding and banter of the early years was no longer in place; instead a more rigid environment developed with new members reluctant to become 'visible'. Active participation in the forums slowed over the years, and the balance between lurkers and active participants reached a point where activity dropped off considerably.

Group 2 participants suggested they felt more confident posting in ENO/REO's online course discussion forums because they were closed to outside, potentially negative participants. Interestingly, despite finding the courses useful, participation ceased as soon as a government mandate to take such courses was removed. A perceived lack of time was cited as a large inhibitor to active participation in voluntary online professional development courses.

3. *Mediated activity through technological tools.* What kind of technology had been available to the members of ENO/REO? How had the technology been used?

As noted earlier, ENO/REO has a number of technological tools available to its members. Initially, ENO/REO offered a free dial-up service, which allowed teachers to communicate with each other across a large demographic area. It became evident throughout this research that the introduction of dial-up services to the first data group had been a powerful motivator for participation.

Both groups found the ENO/REO system involved a fairly simple learning curve despite the experiences of participants in Group 1 who had initially been challenged by early experiences with 'hooking up'. This brings us to one of the major themes running throughout the data analysis, and one of the chief barriers - time. Whether it was lack of time to access the forums and to become involved in online projects, or simply to post resources and connect to others, time was an issue.

4. *New skills acquired through participation in ENO/REO.* How had the environment of ENO/REO supported the members and their learning? What skills had the members acquired?

There was consistency in the belief among all participants that they had developed a number of technological skills as a result of their participation with ENO/REO. These included: online communication skills, technical skills with various tools, pedagogic skills involving collaborative learning, and leadership skills. Participants in both Groups 1 and 2 had explored collaborative projects, changed the way they approached research by honing Internet research skills, and tried new tools; as their confidence grew, so did their classroom experimentation. They also became school "experts" and passed on resources to their colleagues.

5. *Division of labour.* What level of complexity' did participants find in ENO/REO? How 'trialable' were the skills learned?

Participants focused on two distinct areas where there were separate labour requirements and responsibilities. There was the school community, including students, parents, administrators and colleagues, and the ENO/REO system with its emerging leadership.

Both data groups experienced varying levels of support and expertise that seem to typify educational settings where time, finances and expertise are in short supply. Nevertheless, they were able to forge alliances that kept their commitment to information technology highly visible to their individual communities, and they continued to promote the belief that technology played an important role in students' education. They agreed that a supportive administration was a key requirement for successful technological innovation, and that parent involvement was pivotal.

6. *Final goal: integration of technology in the classroom.* Did the school culture support experimentation? How did members assess how skills

gained through ENO/REO resulted in improvement in student practice, if at all?

The participants enthusiastically integrated ideas and resources, discovered through the use of the ENO/REO tools, into their classrooms and felt their students had benefited. While participants had no empirical evidence to support their assertions that students had benefited from their skill development, they had all observed students who were inspired and motivated to use technological tools to complete assignments, to conduct research, and to learn. They noted a rise in literacy skills, improvement in research skills, and increased communication skills as major areas of student growth. Significantly, the participants also suggested that being part of ENO/REO had motivated them to try new and innovative methods of teaching and learning.

Summary

There was a clear indication of community development in the early years of ENO/REO. Many members were attracted to the network because it was seen as innovative. However, the flexibility to promote change and guide design from within the community faded over time which led to the participation of fewer active members. Identities formed by early members appeared to dominate the community and may not have seemed inclusive enough to new members. Also, the technological tools available to the community may inadvertently have made it difficult to negotiate change as patterns of use were seemingly inflexible.

There was a suggestion that public forums may no longer be useful and that instead, online communities should be exploring the use of discussion forums linked to structured professional development opportunities. However, despite the addition of such activities, when they were not officially required, participants lacked the time and motivation to become involved in the online courses freely available at ENO/REO. As use of the Internet has become more widespread, it appears that information overload is affecting participation in online activities.

Conclusion

As the need for training and professional development of educators is becoming more critical due to the increasing complexity of teaching in North America, as well as globally, online networks seem to offer the potential to create professional communities of practice. This assumption is based on several criteria. First, teachers like to collaborate with each other and, in fact, need to do so to enrich their teaching practices. Second, the online environment provides the flexibility to connect anywhere, anytime, and third, teachers' exposure to online tools may enhance their use of technology in the classroom.

Despite the obvious benefits of online networks, the complexities of forming and supporting online communities will need to be addressed if they are to be sustained. Designers will have to balance the needs of the community and the needs of individual members. The success of future online communities will be heavily dependent on:

- the level of information overload,
- the tone of the environment (including all of the community-building practices needed for a healthy community), and
- outreach and marketing.

The emergence of new and innovative tools including wikis and blogs may provide online communities with easily accessible job-embedded applications that are topical and motivating for integration into classrooms. Addressing the barriers of time and information overload may be more difficult, but if the sense of community inclusiveness is attended to, and if the network responds to participants with relevance and appropriate knowledge about new trends and tools, this may ensure that networked communities are sustained for educators in the future.

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