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The Québec English Schools Network RÉCIT: A Case Study in the Development of a Community of Practice

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ABSTRACT

The Québec English Schools Network RÉCIT: A Case Study in the Development of a Community of Practice

Robert Costain

This thesis is a case study examination of the development of the Québec English Schools Network, an educational web site serving the anglophone community in the province of Québec. The early history and efforts to build a community of professional educators on-line are described through personal accounts, interviews and extant data. The original rationale for the development of the Québec English Schools Network is examined in the context of existing literature on computer-mediated communication and communities of practice. Recent data is also presented in the form of an on-line user survey and analysis of web traffic to determine to what extent the site has succeeded not only in building a community of practice but also in sustaining it over time. The examination concludes that while the Network has succeeded in bridging distances and creating a limited professional community, further development and leadership are required to ensure its continued success.

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Dedicated to Jennifer with love and affection,

for believing that I could do it, for spurring me on,

and for supporting me all the way.

Thank you with love to Mom, Dad and my family

for the love and support that they have always given me.

Introduction

For the past six years I have worked with the Ministry of Education and various school boards within the province of Québec as the webmaster of an educational website now called the Québec English Schools Network RÉCIT[1]. The site was originally intended as a vehicle for supporting teachers in small schools and to support new programs at the high school level. It has grown in size and scope to include a wide variety of subject domains, as well as curriculum reform and the integration of technology in the classroom. As a developer for the site and as its Webmaster, I have been able to observe the growth and development of the site firsthand virtually from its inception. The site was first made available at a time when the use of Internet was limited in most schools and non-existent in others. With little or no previous experience, the developers of the site were also learners in their own right, experimenting with new ways of supporting the anglophone education community in Québec.

The Internet, particularly through the use of e-mail and the World Wide Web, has become a ubiquitous part of our daily lives. We use the web for entertainment, to purchase goods and services and to research information. The medium, or rather the various *media* that make up the Internet have been the object of a massive amount of hype as a tool to

improve people's lives by making information and services more accessible to the average person. Some of this hype extends into the realm of education. There is a wealth of educational content on the World Wide Web. However, because the Internet is a relatively new learning tool, methods for developing, evaluating and using instructional content are still in their infancy. Although the educational community has been slower to embrace the new Internet technologies, the rapidity with which they have pervaded our society has meant that quality control has been lagging. Although the literature on computer use in schools has grown in the past few years, tools for evaluating Internet educational content are still in their formative stages. The nature of the technologies themselves makes evaluation of both the content and how it is used problematic at best.

However, there are many good reasons for educators to choose the Internet as one of their stock tools. The motives range from the practical and economic to the need to find new ways to enhance the learning experience. What follows is a look at some of the reasons that such technology was seen as a way of providing support to the English educational community in Québec.

Throughout the late 1980s and 1990s, although the cost of producing educational materials and support tools continued to increase,

governments cut back on funding to the education sector (as well as other social services) in order to save money and eliminate deficit financing. Schools and school boards were placed in the position of having to do "more with less." Frequently it was professional support to teaching practitioners that was the first to be cut back. This led to a search for new ways to deliver support. In the Québec context, in times of rationalisation of the economy, the availability of materials in English that matched the curriculum was problematic at best. Lack of economies of scale mean that the cost of producing or translating original materials is prohibitive given the size of the English community.

Another factor particular to Québec is distance. The English community in Québec is concentrated in the Western part of the province (particularly Montréal). However, anglophones can be found in almost every region of the province. Unfortunately, schools in areas where the English community is sparse are often quite isolated in comparison to schools in the urban areas. Economies of scale mean that travel to remote parts of the province is extremely expensive. In fact, in areas of the Lower North Shore such as Harrington Harbour or La Tabatière, the only access in or out is by air or water. Access to print materials is possible, but face-to-face communication is problematic. Professional development in innovative teaching techniques, or project-based learning

involving cooperation with teachers and students in other schools is not easily arranged.

Another factor that drives the development of sites like the Québec English Schools Network – RÉCIT is the pervasiveness of technology itself. While society has become very technologically oriented on many levels, from television to home computers to DVDs, the educational community has often lagged behind in adopting or recognising the value of technology. There are numerous reasons for this delay. On one level is the lack of support for teachers in the use of technology. Sparks and Loucks-Horsley (Sparks & Loucks-Horsley, 1989) identified some conditions that they believe are necessary to support staff development in schools. Among them are support for collegiality and experimentation, administrators who clarify goal and expectations with staff, and commitment by authorities to support teachers to change their practice. However, in many jurisdictions this support is not available to the extent that it should be.

In many pre-service teaching programs, new media technologies are not sufficiently promoted as useful learning tools. Courses in information and communications technologies are often not required. In the community of practitioners, teaching technique has until recently been rooted in the idea of the teacher as expert passing knowledge along to the

their students. Raizen *et al.* (1995) recommend that teachers be given positive professional development opportunities with qualified professionals. They decry the all too common use of one-shot professional development especially in the use of technology, describing it as counterproductive. New constructivist approaches such as project-based learning or portfolio assessment are still works in progress. With the arrival of new technologies, the students themselves often supplant the teachers as experts in the use of technologies. Additionally, when effectively used, new learning technologies shift the emphasis away from the lecture oriented teaching that was the rule in the past (Burge & Roberts, 1998). This parallels the shift towards more constructivist teaching approaches. For teachers this can be both intimidating and frightening.

The growing presence of technology in the school milieu is complicated by the reality that many schools have until recently had to manage with old, outdated equipment because the funds have not been available to provide new equipment. Although schools sometimes benefit from private or corporate donations of used equipment, the equipment is often old and obsolete. The cost and human resources needed in order to make donated equipment useful to schools is unaffordable. As well,

donated hardware must be equipped with appropriate educational software at additional cost.

Skills related to the use of technology are seen as a prerequisite to many kinds of employment. If we assume that one of the major roles of our education system is the preparation of our children for the job market, then it stands to reason that the use of technology should play a far greater role. More and more, employers are expecting those entering the job market to possess at least basic skills in the use of computers and software in addition to the more traditional domains. In today's world, it seems that our youth need to be computer literate in the sense that they should be able to adapt and adopt new technological skills as they are exposed to them. Burge and Roberts (Burge & Roberts, 1998) identify some key imperatives that drive the need for technology in classroom teaching. According to the authors, trends indicate the increasing presence of computers in the workplace, institutions of higher learning and homes. Schools have followed that upward trend to varying degrees, depending on the jurisdiction and the resources available to them. Irrespective of this, learners have come to expect the presence of technology in their places of learning.

Lastly, a reason for turning toward web technology as an educational learning tool is the simple fact that it is already being done. As soon as

the use of the Internet became widespread, people began using it for educational purposes. The Internet began as a collaborative effort between government and universities to create a robust and rapid way of exchanging research knowledge. Although concentrated initially in the areas of computer science and engineering, the use of computers spread to other subject areas. With the introduction of microcomputers and the personal computer, the technology became accessible to elementary and secondary schools. However, although the educational applications have been there virtually since the beginning of the Internet, this does not mean that the technology has always been used well. Indeed, there is a great deal of poor quality content on the Internet and much that it inappropriate for use in schools. As such, the way to counter bad use of good technology is to counter it with quality content that is well grounded in established learning theory.

The introduction of new programs and curriculum provides a further impetus for the integration and use of technology. Over the past half-decade, new programs have to varying degrees codified the integration of technology into the learning process. As an example, one of the current secondary mathematics programs in Québec recommends the use of a graphing calculator as an integral tool for understanding the course content (Direction de la formation général des jeunes, 1996). While the

new curriculum introduced in the 1999-2000 school year is not fully explicit in the way it integrates technology, the new competencies that comprise the programs are at the very least media and "Internet-aware." In other words, they recognise that computers and the Internet are ubiquitous and have become one of the standard research tools available to learners.

This thesis proposes to examine the development of the Québec English Schools Network RÉCIT as a case study in the development of an on-line learning community (or Community of Practice) (Lave & Wenger, 1991). As I was intimately involved in the growth of the site, I intend to compare my own experiences with those of people who have worked on and have used the site, as well as examples from the literature. Because this thesis focuses on the original intent of the QESN and its development, the personal chronology aspect will be confined to the initial development of the site (i.e. the first two years). The pattern of usage of the site over time, in the form of web log analysis, will also be used to shed some light on whether elements of the site are successful or not. This exercise in reflective practice will serve as an instrument to evaluate and improve the website and as a tool for my own professional development (Argyris & Schön, 1974). The research approach also incorporates some elements of emergent theory after Glaser and Strauss' "grounded theory" approach

(Glaser & Strauss, 1967). Data is collected in the form of interviews, survey and literature. After the data has been assembled and examined patterns become apparent and theories may emerge from both the data and the literature (Dick, 2000).

The role of the Québec English Schools Network RÉCIT as teacher professional development community has already been examined with respect to specific projects (Caron, 2000). In that study, participatory evaluation was used as a strategy for evaluating the efficacy of an online communication framework. This thesis takes a more macro view of the QESN RÉCIT Internet site as a community or collection of smaller communities and addresses the issues in a more general way, rather than addressing a particular project.

This case study proposes to address the following fundamental question: The Québec English Schools Network – RÉCIT has been developed in order to build and maintain an on-line learning community to bridge distances and provide support in new programs.

To what extent has the QESN RÉCIT succeeded in creating such a community?

How is success achieved, how can it be recognised and how can it be measured? This first question leads to some ancillary questions that will also be addressed:

- What specific problems or issues have been identified during the development of the QESN RÉCIT?

- What future actions or strategies would improve the success rate of the QESN RÉCIT?

- What can be done to improve participation in the learning community?

Methodology

There are four primary sources of data in this study. The chronological first person account which follows provides the basic information about what happened and about the processes that were occurring during the development of the QESN website and its related services.

Given the reflective nature of this study, a first person account of events is entirely appropriate. However, despite the best of intentions, memory is never perfect and biases can come into play. There are a number of ways to ensure the accuracy of events related from memory, and these methods have been incorporated here. Firstly, the narrative portion of the thesis can be submitted to a "member check" in which individuals who participated in the events described are asked to read the account and confirm its accuracy. They are then given the opportunity to suggest changes where warranted. Secondly, the first person account can be verified by comparing it with extant documentation that is relates to the events as they occurred.

In order to obtain some verification of the chronological account, the narrative portion of the manuscript was submitted to three of the principal actors in the events described. Although a comprehensive record of correspondence and documentation has been retained,

verification of facts and events by others increases the accuracy of the overall account by providing some triangulation. It also serves to provide varying perspectives not necessarily in agreement with the author about decisions that were made in the development of the website and the evaluation of what resulted from those choices.

The first member check respondent was Laurent Trudel, a project officer with the Ministère de l'Éducation, Services à la communauté anglophone. The other respondent was Christiane Dufour, resource person for the original Small Schools Network and later the Québec English Schools Network. Laurent Trudel responded by phone and Christiane Dufour returned an annotated version of the text. Both respondents suggested minor changes or corrections, which are detailed below.

Laurent Trudel noted the following corrections:

- In the original manuscript my role as a sitting member of MAPCO is largely overlooked. Upon being hired by MAPCO in mid-1996 I became a full member of the committee and continued to sit on MAPCO until mid-2000. He stated that as a member of MAPCO I had participated in discussions and influenced policy and

direction, especially with respect to the development of the web site.

- The original narrative made the point that at the time the web site was conceived and developed, there were few models for the kind of support that we set out to offer. According to Laurent Trudel, while this was true, the end result was that as a team we developed our own model (see No. 3 below).

- My contribution to the development of the Computer-Based Support model was greatly underplayed in the original narrative. I originally wrote much of the Computer-Based Support model (with feedback and comments from Laurent Trudel and Deborah Gross). It was originally written as a guide to connectivity to be distributed at an implementation session for high school mathematics teachers in June 1996. I was later given a mandate to expand on what I had written. This expanded version became a section of "A Framework for Improving Student Performance in Mathematics" that was published by the Ministère de l'Éducation du Québec.

- I had originally written that we identified the animators of our math listserv from attendees at the June 1996 implementation session. In fact, The math listserv animators who were recruited

at the June 1996 implementation session were drawn primarily from the membership of the Math Coordinating Committee (MCC), a body which coordinates curriculum implementation and policy for the English sector in Québec. As such, they were already well known by the math teaching community with established reputations as leaders and pedagogues.

Christiane Dufour's comments were as follows:

- In the original narrative Judi Harris' work in constructivist project-based learning was credited as the basis for the telecollaborative projects that were spearheaded by the Small Schools Network. In fact, Christiane Dufour wrote that she only became aware of Harris' work after two years of working on the Small Schools Network and that it fit well with the existing approach. The approach promoted by Harris became a more structured version of what the Small Schools Network had already been doing spontaneously.

- She also pointed out that the original narrative did not provide a clear description of the evolution of the Small Schools Network from cc:Mail to the World Wide Web. It was transition of the SSN

to the web that ultimately led to the development of the Québec English Schools Network.

The second source of data consists of extant documentary data in the form of reports (e.g. Task Force on English Education), e-mail messages and other documents. The extant data, some of which precedes my involvement in the project, provides the rationale and vision behind the initial development of the Small Schools' Network and subsequent development. This extant data is intended to ensure the veracity of personal accounts and to provide further triangulation as to their accuracy.

A third source of data is provided in the results of an on-line survey of users of the QESN RÉCIT web site. The survey collected information about users, their general Internet usage, use of the site in particular as well as attitudes towards collaboration on-line. This data will be weighed against the QESN's original intent as reflected in the personal account(s). This will help to determine to what degree the site has been successful in fulfilling its original objectives of creating an on-line community of practice.

Lastly, analysis of web server usage logs will offer more objective, if more general data about the pattern of web site usage from the site's inception

until the present day. Web server statistics provide data about the number of visits to the site in relatively absolute terms, though they do not present about "who" used the site or whether site content has been read, understood or used as a resource.

Chronology & Review of Literature

Initial Involvement

My involvement with the Ministère de l'Éducation du Québec (MEQ) began in the early summer of 1995. A series of seminars was held to explore internship and research opportunities for graduate students in Educational technology at Concordia University. The Centre for the Study of Classroom Processes (CSCP)[2] sponsored these seminars. Deborah Gross, from Services à la communauté anglophone at the MEQ, animated one of the meetings I attended. Ms. Gross and her colleague, Christiane Dufour, told us about a project called the Small Schools Network (SSN) that was set up to use technology to support teachers in English schools across Québec. The Small Schools Network grew out of *The Task Force on English Education. Report to the Minister of Education.* (a.k.a. "The Chambers Report") (1992). This watershed report identified several keys areas in which the English education community in Québec needed improvement. One of the specific recommendations of the report was that smaller, primarily rural schools outside of the Montreal area needed increased support. These "small schools" were often isolated and had little access to the pedagogical consultants or technological innovations taken for granted by suburban and urban schools. The Small Schools Network was envisioned as a way to close the gap between

rural/regional schools and their urban counterparts, and to "diminish the isolation factor of our small schools" using information and communications technology (Weber, 2002). The method used was primarily e-mail and a project-based approach to pedagogy. At its inception, the intent of the Small Schools Network was to use the technology itself as a way to break the isolation of small schools.

According to Christiane Dufour, it was felt that the best way to do this was to connect classes "through meaningful communications activities." These "telecollaborations" involved cooperation among participant teachers and students at all stages from planning to activity to reporting or showcasing of results. The process also involved informal exchanges among teachers about what they were engaged in. The goal was to create a "(vibrant) virtual community (Dufour, 2002)."

Approaches to Professional Development

Teachers, like any other professionals, are expected to participate in their own professional development. As such, they can be defined as both teachers and learners. The problems facing many teachers are ones of time and support. There is often too little time within the parameters of many teachers' working experience to be able to engage in many meaningful professional enhancement opportunities. Additionally,

teachers are expected to participate in many activities that fall outside of the direct purview of classroom teaching, such as extracurricular activities, field trips, etc. Professional development activities (so-called "pedagogical" days) organized at the school or school board level do not always address teachers' most pressing needs. As concepts of teaching and learning evolve, the ability of teachers to stay current is a problem.

Various models of reflective practice and action research seek to address some of the issues that the teaching community face by focusing on professional development and/or enhancement in a more proactive and organic fashion. The common thread through many of these approaches is one of reflection as well as cooperation.

Hargreaves and Fullan (1992) argue that traditional approaches to teacher professional development should give way to more personalized and reflective strategies. In their view, conventional professional development methods have been primarily knowledge and skills-based. They criticize the traditional view by stating that professional development tends to be too "top-down" and puts "undue confidence and clarity" in the findings of educational research. The authors view is that while skills and knowledge-based professional development is valuable, it consumes too much time and too many resources.

Thiessen (1992) proposes "Classroom-based teacher development" which combines "personally meaningful" and "educationally defensible" practices. This focuses on self-directed development and has three main strategies: Building Joint Endeavours; Probing for Meaning; and Promoting Collaborative Development. This approach puts teachers in the position of learning from each other, suggesting that colleagues are the "most valuable source of professional development." This approach can be seen in the Québec English Schools Network, as it grew from the Small Schools' Network. The *raison d'être* of both was to break the isolation of small, non-urban schools through "meaningful communications activities" (Dufour, 2002).

Argyris and Schön (1974) argue that an effective approach to professional improvement lies in *reflective practice.* The pair posits that in practice there is a dichotomy or disparity between how an individual understands and expresses theory ("Espoused Theory") and how they actually apply it ("Theory-In-Use"). This incongruity often operates at a subconscious level, and thus the key to solving performance problems or improving performance is to make the individual(s) aware of the discrepancy and generate a congruence between espoused theory and theory-in-use. For the authors, this involves self-reflection and analysis. The most successful online collaborations and exchanges in the context of the

QESN often involved reflection and discussion of teaching practice. Interestingly enough, during the period of the Small Schools' Network, this kind of informal engagement amongst teachers took place exclusively at the elementary level. Since the inception of the QESN, the focus has shifted to the secondary level. While the communication has not been as frequent, the conversation, especially amongst math teachers, has often been very reflective on the teaching process in mathematics.

The reflective practice approach "combines the ability to both engage and distance" so that the practitioner utilizes their personal experience but is able to view it in its proper context (Wenger, 1998). The reflective practitioner's role is to move beyond observation and "towards participation in the action we wish to understand" (Louden, 1992). Reflection can take different forms, which Louden divides into four basic categories: Introspection, Replay and Rehearsal, Enquiry, and Spontaneity – Reflection. One way of reflecting, argues Louden, is to engage in collaborative research that involves shared experience and shared meaning.

Lave and Wenger (1991) propose the idea of "communities of practice" (CoP) as an instrument or process for enhancing learning and meaning. Wenger (1998) proposes a "social theory of learning" and suggests that

learning is by definition "fundamentally experiential and fundamentally social." As it relates to reflective practice, the CoP on one level provides practitioners with an opportunity to observe others and attain some distance and perspective on their own practice.

ScienceNet: Small scale support for teachers

Several weeks after the initial introduction to the Small Schools' Network, the students who had attended the initial meeting were invited to a follow up meeting in which specific projects were discussed. I was invited to visit Centennial Regional High School (CRHS) in Greenfield Park to see if I could support any of the teachers there in the use of technology and the Internet. The Ministry was initiating a project nicknamed ScienceNet. The goal of the project was to familiarize science teachers with the Internet as a tool. It was hoped that the teachers would begin to use the Internet as a resource for both themselves and their students. The Ministry provided money for a telephone line and an Internet Service provider.

As part of the teachers' training in the use of the Internet, I spent two separate days at CRHS along with several people from the MEQ and some pedagogical consultants from the school board. We worked with five teachers from the science department to develop their Internet skills.

The group's knowledge base was mixed when it came to the use of e-mail and the World Wide Web. A couple of the teachers were quite intimidated by the technology and had used it very little. However, two of the other teachers had worked on creating a web page for the school. Within the small group it appeared that with one exception, the degree of comfort and skill with computers and the Internet divided along gender lines. The two female teachers and one of the men in the group were quite reticent about it and used it rarely. The two teachers with higher skill/comfort levels were both male. I spent several hours working with the teachers attempting to get them used to the Web and to give them tips on using e-mail.

After spending time working face-to-face with the teachers, I proposed to Ms. Gross that I continue to support the teachers at a distance through e-mail. I would record what occurred and use the information that I collected as an academic project for one of my courses. I gave my e-mail address to all of the teachers. Over the next several weeks, I periodically sent out a "tip sheet" that focused on a single skill associated with using e-mail or the web (e.g. creating an address book or bookmarks of web sites, etc. – See Appendix D). Each time I sent out a tip, I asked for feedback and for the teachers to contribute whatever questions they might have. My plan was to tailor the "tip sheet" to specific questions.

Given the heterogeneity of the group, it was hard to customize the lessons that I was developing. The teachers who were already comfortable using the Internet did not seem interested in them. In addition, the teachers who lacked skills seemed intimidated and hesitant to demonstrate their lack of knowledge by asking questions. Despite this, I tried to focus on basic skills and continued to send out regular tip sheets throughout the fall of 1995.

In February of 1996, Deborah Gross invited me to a meeting of the Small Schools Network resource team. The team was composed of practicing teachers who developed projects and shared them with other teachers. Once a project was developed, each team member would animate the project and mentor other teachers throughout the province of Québec. The medium used to animate and mentor was cc:Mail, a basic electronic mail system that was accessible from most places in Québec. The software was an effective way to communicate across large distances, but it was limiting in that it was not directly part of the Internet. In other words, users of the system could communicate with other cc:Mail users in Québec, but access to the larger Internet community was indirect. This seeming limitation actually proved to be an advantage, as it reduced the "signal-to-noise" ratio of communications amongst the teachers at

various schools. This provided them with a more "gentle" introduction to the world of computer-mediated communication.

At the meeting, Christiane Dufour showed a web site she was developing with the help of another Concordia student, Mindy Schok. Everyone in the group felt that the World Wide Web had great potential in terms of reach and ease-of-use. However, a key concern was that in the process of moving the support system to the web, the resource team would be overwhelmed. Since the web site would be accessible from outside the Québec educational community, some feared that the team might be inundated with requests to participate in projects. As a result of these concerns, it was decided to proceed with caution. However, the general feeling was that the web was becoming so popular that to avoid it would be detrimental in the long run.

During this time I used the information I had gathered during the Centennial Regional High School ScienceNet project as an exercise in training needs assessment for a course in the Educational Technology program at Concordia. I surveyed the teachers to find out whether they had used the tips I had provided, whether the tips were useful, and what skills they felt that they needed more support with. The results of this TNA were fairly predictable. The teachers who had few skills were grateful for the support and wanted it to continue. Teachers declined to

respond if they felt that they were further ahead or comfortable with the tools.

Mathematics Action Plan Committee (MAPCO)

In April of 1996, Laurent Trudel of SCA-DPP hired me to join the Math Action Plan Committee (MAPCO) as a resource person and to develop a web site to support math teachers in the implementation of a new Secondary II mathematics program (Mathematics 216). Laurent had participated in the ScienceNet training at CRHS and had been impressed by my work. The MAPCO committee came into being in 1995-96 in response to a significant discrepancy in mathematics examination results between the French and English sectors (Mathematics Action Plan Committee (MAPCO), 1997). Students in English schools had a higher failure rate than their French counterparts. The MEQ created MAPCO, a group of teachers, pedagogical consultants and administrators to study the problem, perform a needs analysis and offer solutions and support. The causes of the discrepancy were still under study, but MAPCO was taking advantage of the introduction of new programs to offer increased support to the English community.

Working initially under the mentorship of Christiane Dufour, I participated in the preparation of a "refresher" session for Math teachers

scheduled for the end of June that year. The meeting was a series of workshops designed by MAPCO to familiarize teachers with the new program and model more constructivist teaching methods. My role was to document the content of the workshops and then develop a web site to provide follow-up support.

There were several strong rationales for the development of the site. The main reasons were economic and logistical. Up to this point professional development support of the math curriculum had relied on the "*multiplicateur*" or "multiplier-effect" training model. This model, also known as the "train the trainer" model, is based on the principle that training on a large scale can be accomplished by training key individuals within an organisation or a community and empowering them to pass the training on to their colleagues. It was felt that this approach was inadequate and outdated especially in light of the introduction of the new Mathematics 216 program (Trudel, 2002). Additionally, the resources to provide support to schools in remote areas were not available. Many school boards were in the process of reducing costs and were cutting back on or eliminating specialised pedagogical consultants. A pedagogical consultant hired by MAPCO to give in-service to individual schools found the geographic distribution of her target audience was barely manageable. The consultant faced a year of constant travel to

remote regions of Québec, which was not only challenging, but also involved considerable expense.

We hoped to bridge the physical distance between support person and teacher by setting up an infrastructure of ongoing support using the World Wide Web and e-mail. The consultant would still supply the face-to-face in-service support, but only once per year. All follow-up, support documentation or answers to individual questions would be accessible via the Internet. She would not have to revisit the various schools and would able to focus on developing resource materials and lists of frequently asked questions (FAQs). My role was to work with the resource person to design and develop those support materials, and to assist in moderating online communications amongst teachers. Providing a support web site and supplementary e-mail mailing list was both more cost-effective and more efficient. It remained to be seen whether support using computer-mediated communications would be as effective as face-to-face.

A by-product of this strategy for providing ongoing support to teachers was a unique opportunity to exploit new communications technologies such as the Web and e-mail. The Internet was still in its infancy as a mass communications medium, and the use of the Internet as a teaching and learning tool was just beginning. There were virtually no models for

the kind of support that MAPCO hoped to offer. From the few examples that did exist, there was little data to assist us in knowing what worked and what did not. The web site would be a real exercise in action research on the use of the Internet for teacher professional development.

It was decided that given our unique context, we needed to develop our own support model. The result of this decision was the development of a "Computer-Based Support Plan" to "address the need for on-going animation and support when implementing a new program and allow teachers to network and exchange ideas and best practices, opinions, leads, etc." (Trudel, 2002). The plan was based on an outline developed by Laurent Trudel and Deborah Gross, and one of my tasks was to further develop the plan and then implement it. Aside from building the e-mail and web-based support tools, this involved drafting a document describing the support model that would be distributed to teachers at the June "refresher" session. The document that I wrote contained the nuts and bolts of the support that was being offered for new program implementation, as well as a "connectivity guide" to help teachers who were new to e-mail and the Internet (Costain, Gross, & Trudel, 1997). This document was subsequently updated and revised. It became a section of the document published by MAPCO and the Ministère de

l'Éducation called "A Framework for Improving Student Performance in Mathematics." (Mathematics Action Plan Committee (MAPCO), 1997)

The strategy for creating the web site was a kind of rapid prototyping. There was little content to post on the web and a fuzzy conception of how the site would actually be used. Working with the resource consultant, we had to anticipate *probable* uses of the site and build an infrastructure or "container" to house what we thought might be developed over time. I expected that we would develop formative evaluation strategies to adjust and fine tune the site based on feedback from users and the MAPCO members. I also anticipated that as a member of MAPCO, I would be in an ideal position to learn what the important issues were and to develop strategies to address those issues using technology.

Another challenge was to develop an on-line community of math teachers to share their concerns and problem-solving strategies when it came to implementing the new program. Not only were many of the teachers venturing into uncharted territory when it came to the new Math 216 program, the great majority of them were complete novices when it came to computers and the Internet. There were a few early adopters who *did* use the Internet, but most used it as a personal hobby and had not explored it as a way to assist or enhance their teaching practice. The task was:

- To help the teachers become aware of the support infrastructure available on the website;

- To encourage them to share their questions and concerns; and

- To develop their skills in using computers and more specifically the Internet.

Deciding on the form and content of the site involved some negotiations with Laurent Trudel. After attending a two-day session along with workshop animators in order to prepare for the June session, Christiane Dufour and I brainstormed some ideas for the web site and the form that it would take. When we pitched our ideas, we were surprised when Laurent Trudel asked us to discard or hold most of them in check. He believed in the K.I.S.S. (Keep It Simple, Stupid) principle and did not want us to use too many "bells and whistles." He also felt that MAPCO members should feel ownership of the site and drive the development of it. Since Math Action Plan Committee was composed of community members: administrators, pedagogical consultants and teachers; he felt that the direction of the site should emanate from the grassroots. I was not well known yet by the other members of MAPCO and had not yet fully established my credentials as a resource person on the committee. According to Laurent Trudel, it was better to be prepared to implement

some of the ideas that we had proposed, but keep some of the more 'advanced' of them in our "bag of tricks." At such a time as the committee expressed any of the needs that we had anticipated, we would be ready to implement them without delay. Initially it was difficult to work using this approach. I was more accustomed to being asked to come up with ideas for projects that would be developed or designed immediately, not much later in the process.

As a result, the site that I built initially responded only to the most crucial needs that MAPCO had articulated. The content of the first version of the "Mathematics Teaching Resource Centre," as it was called, contained only basic content. There was an "Offer of Service" from the MEQ for the June Sessions and the services of the consultant/resource person, a listing of some basic support materials and a description of the listserv (e-mail mailing list). In practice, this suited me quite well. My previous experience in creating a web site was quite limited, and I had only dabbled in HTML, creating a simple web page for the Research Methods course for which I had been a teaching assistant the previous school year. At this stage in the development of the Internet, most sites were quite basic, containing only text and graphics. Creating a relatively barebones site would provide me with the opportunity to develop my HTML skills. Multimedia on the web would not become a factor for

another year or more with the advent of Macromedia Shockwave, Flash and streaming audio.

I created the first iteration of the Math site in time for the June workshops. The site was hosted, along with the existing Small Schools Network site on a server operated by Gestion des Réseaux des Commissions Scolaires (GRICS), a non-profit IT services corporation operated by the various school boards and the MEQ. With the help of GRICS, we also set up a listserv for math teachers and I created a job aid to help people sign up for the service.

At the June session Laurent Trudel gave a workshop detailing the support that the MEQ proposed to provide. I gave a quick tour of the site and a brief primer on using electronic mail and the Web. We had distributed the Computer-Based Support Plan to all of the participants (Costain *et al.*, 1997). Although I had been made aware of it beforehand, I was surprised to discover that very few of the teachers had much Internet experience. The reaction to our proposed support system was a mixture of cautious enthusiasm and mild hostility. Many of the teachers present were probably intimidated by the technology, but others saw the move to the Internet as an attempt to *cut back* on conventional services rather than enhance them. Fortunately, Laurent Trudel, as a

representative of the Ministère, bore the brunt of the hostility and did his best to explain the rationale behind what we were doing.

During the sessions, Michael Cooper, another MEQ project officer from the Outaouais region, proposed that we identify some individual teachers during the sessions and enlist their aid in getting our on-line "learning community" off the ground. Since we had no idea how *much* the system would be used, let alone how it would be used, it was difficult to scale our efforts. We wondered if we needed to divide our target audience by region, or grade level or years of experience. It was suggested that we create several lists to deal with what might end up being an overload of traffic on our system. There was a fear that too much e-mail would frighten novices out of using the support system. My view was more conservative. I suggested that use of the site and of e-mail would be slow at the outset, especially given the number of novices at the session I gave on the site. I felt that it would be better to start off with one e-mail list for people to communicate with each other. Firstly, it would allow us to focus the resource that we had rather than spread them too thin. Secondly, it would allow us to develop a "critical mass" of users and increase the likelihood of success.

The recruitment of some enthusiastic individuals increased the human resources available to us, and also provided us with a valuable source of

formative evaluation for the site. This is because the teachers we recruited were, like their colleagues, implementing the new math program for the first time and could provide us with valuable information as to what their needs and concerns were. However, it was also important that those individuals whom we identified be known in the teaching community and have established credibility. In the interests of ensuring the quality of the discourse and of creating a sense of community, it was felt that we needed to work with people whose work we knew. Before the end of the two-day session, we assembled the five teachers (Neil Macintosh, Sam McLauchlan, Bill Nevin, Elizabeth Joyce and Christine Deschenes) and asked them to play several roles for us:

- Animating the list discussions by asking questions actively and attempting to answer them;

- Mentoring new users by responding to their queries on the listserv; and

- Providing us with feedback/suggestions/comments about the site and their use of it.

This group of animators was drawn primarily from the membership of the Mathematics Coordinating Committee (MCC). This committee is a

working group composed of pedagogical consultants and teachers drawn from virtually all of the school boards and independent schools in the English sector. Their role is to deal with issues of common concern relating to the teaching of mathematics, such as new program implementation, as well as common and provincial examinations. The teachers we enlisted were also selected for their skills as educators and their enthusiasm, not their skills with computers or knowledge of the Internet. In exchange for their services, we would offer them support and training. I would provide the teachers with technical training for e-mail and using the Internet. We organized a workshop in the autumn of 1996 on giving support at a distance and using on-line communication.

At the workshop, we engaged in team-building activities with the animator group. Though we could not provide extra release time or compensation to our volunteers, we did want them to feel that they were part of a team that was engaged in promoting real change. As a group we crafted a mission statement and discussed what would be involved in moderating on-line activities. In order to model the kinds of activities and the approach that we hoped that the moderators would follow, we held our workshop in a computer lab and asked our moderator group to do all their communicating via e-mail addresses that we had set up for them.

After the activities were completed, we sat together and discussed what had occurred.

Communities of Practice

One of the major goals in setting up the MAPCO web site, and later Québec English Schools Network was to build a community. Our goal in asking teachers, consultants and experts to participate in listservs was to solidify the collegial atmosphere and leverage existing expertise. One of the originally stated goals of MAPCO's Computer-Based Support Plan (Costain *et al.*, 1997) was to assist teachers in the implementation of new programs and improve student performance by providing access to pedagogical experts (consultants or experienced teachers) on-line. Although not stated explicitly, this approach can be said to be an attempt to form a "community of practice."

Lave and Wenger (1991) discuss collaborative learning in the context of "Communities of Practice." The term "community of practice" evolved from theories of cognitive apprenticeship and situated learning. The authors state that learning is a process of engagement as "a full participant in a sociocultural practice." The social process of a community of practice includes the learning of knowledgeable skills. Wenger (1998) proposes a "social theory of learning" which describes

learning as an innately social process. He suggests that this is because learning is the development of shared or accepted meaning and occurs within the context of "our lived experience of participation in the world." Wenger's premise is that humans are social beings; that knowledge is "a matter of competence" with respect to endeavours that we value; that "knowing" implies participation in those endeavours (*i.e.* "active engagement in the world"); and that "meaning – our ability to experience the world and out engagement with it as meaningful – is ultimately what learning is to produce." A community of practice (CoP) is a group of individuals with common skills, needs and goals. The concept of a community of practice, in which people share experiences, concerns and skills through some communication medium, places the focus on participation in the learning process. The process of learning is, or is parallel to, the process of becoming part of and engaging in the larger community. For a novice, CoPs create opportunities to see experienced practitioners in action and to gain knowledge and skills from them. This learning comprises the "obvious" skills required to do a job, but also subtler "tacit" cues as to how an expert goes about their business (Brown & Duguid, 1991).

The CoP as an entity lends itself to the use of new communication technologies. The creation of social structures, either face-to-face or

online facilitates participation and involvement in the social process. According to Wenger, CoPs provide access to resources that supplement an individual's participation and expand their horizons. Participants can "put themselves on learning trajectories they can identify with." It involves learners in "actions, discussions, and reflections that make a difference to the communities that they value."

When a group of individuals with expertise or goals in a specific area coalesces, then the concept of learning as shared meaning become particularly important. Not only does a "community" of this type share similar goals and needs, they often also share a language for communicating about what it is that they do. Newcomers to the community must not only acquire the requisite skills in order to practice, they must also learn the language of discourse among their peers.

The community of practice "encompasses apprentices, young masters with apprentices, and masters some of whose apprentices have themselves become masters." Wenger states that education within a CoP is a "mutual development process between communities and individuals" that extends beyond simple socialization. Wenger writes:

> Once learning communities are truly functional and connected to the world in meaningful ways, teaching events

> can be designed around them as resources to their practices and as opportunities to open up their learning more broadly. Again, there is a profound difference between educational design as the source or cause of learning and viewing it to a learning community (Wenger, 1998).

For teachers, participation in their community of practice is as important as it is for their students. Unfortunately, Wenger's observation is that teaching professionals are far too preoccupied with managing large classes and performing their pedagogical and institutional functions.

Gongla and Rizzuto (2001) describe a developmental taxonomy for communities of practice within large organizations. They stress that formal structure within an institution or organization is not necessary in order for a CoP to succeed. In their words, CoPs will evolve and attain varying levels of activity, participation and structure depending on the needs of the community at any given moment. For instance, a CoP which has previously existed as a loose, informal structure might experience a period of greater participation and formalize structures in order to address a specific need or needs, Conversely, the CoP may revert to a more loosely structured, informal state once those needs have been addressed or if there is no imminent need. The authors promote the idea of CoPs as naturally developing when a need arises and the conditions

are favorable, but caution against attempting to engineer them with top down management and protocols.

Raizen *et al.*(1995) reinforce the importance of professional collaboration amongst teachers. The process of planning activities and projects together allows teachers to learn from each other and reflect on their practice. The authors report that research has shown that most teachers rarely communicate, even on an informal basis, about education issues.

Pennell and Firestone (1998) describe state-supported networks in California and Vermont that function as an alternative to traditional inservice professional development models. These are not technology-based networks, but networks in the traditional sense of the word. In California, networks are organized into "California Subject Matter Projects" (CSMPs) that are loosely linked to the state department of education department and to reform initiatives. These CSMPs, create opportunities for teachers exchange ideas and materials, assume different roles and learn about innovative techniques. In Vermont, similiar networks were set up to support the use of portfolio assessment. The two networks differed in that the California model was very loosely tied to governmental and curricular goals while in Vermont, the network was much more structured and tied to curricular objectives. In both the

California and Vermont examples, these state-sponsored networks proved to be effective and cost saving in a time of restrained budgets.

Wineberg and Grossman (1998) look at the process of creating a community of learners among high school teachers. The goal in this case was to allow teachers the time and the opportunity to continue learning themselves. The problem as posed by the authors is that conventional inservice does not address the needs of teachers, nor do they derive much benefit from it. Most professional inservice tends to be removed from the classroom and provided at times when integrating what one has learned into teaching practice is difficult. The idea of creating a community of learners among teachers accomplishes several things: it eases the time burden on teachers by spreading learning out over time; new techniques and approaches can be applied on an ongoing basis; and it allows teachers to obtain support after the fact. In this particular study, regularly scheduled meetings were scheduled in conjunction with a summer institute. While this example is more structured than the Gongla and Rizzuto description of a CoP, it demonstrates the value of communication and sharing among teaching professionals.

Lieberman (2000) discusses the role of networks as learning communities. She envisions their role as agents of educational reform and teacher professional development. Professional collaborative

networks allow development amongst cooperative peers, rather structures imposed by external expertise. New technology enables the nurturing of these collaborative structures because it transcends time and distance. The author chronicles research on the development of several networks that closely parallel Lave and Wenger's description of a community of practice. Lieberman describes the successful network as being one which is "continually learning and reinventing" itself. She cites research showing that many teachers who participated in collaborative professional communities subsequently attempted to adapt the same kind of collaborative atmosphere to their classroom teaching.

The role of technology in supporting the kinds of learning communities described above is discussed by Riel and Fulton (2001). The authors discuss the fundamental way in which the development of learning communities has changed the way that school learning occurs. They discuss the advent of subject- or topic-specific communities of practice and how the shared "way of knowing" adds value to practice. Internet technology, write Riel and Fulton, adds value to existing technologies by enabling two-way modes of communication and thereby transcending the classroom. Examples that they cite include electronic field trips, online mentoring, distance education, digital tools and virtual reality. As it applies to teachers, they state that the learning community model breaks

the isolation sometimes felt by individual teachers. Communications technology creates opportunities for collaborative learning environments in which they can reflect on practice, share expertise and build "common understanding." The Maryland Electronic learning Group (MELC) stands as an example of this type of professional support.

Origin of the Québec English Schools Network

After the June "refresher session" ended, I began to build the MAPCO web site in earnest. My task for the summer of 1996 was to take the shell I had demonstrated and turn it into a full-fledged web site with content. I was hired to create two additional web sites for the Services à la communauté anglophone at the MEQ. The first was intended to provide information about professional development grants available to schools and teachers through the Ministère and the teacher unions. The second job was to adapt a report prepared by the Advisory Board on English Education (ABEE) and make it publicly available on the Internet. Although I was asked to design the web interface for each of these projects, they consisted primarily of converting existing documents to HTML format for subsequent posting on the web.

During the months preceding my hiring by MAPCO, Christiane Dufour had been in the process of adapting the Small Schools Network

structures she had developed into a web site. This web site served several purposes:

1. To serve as an informational reference for those teachers who participated in telecollaborative projects by cc:Mail;

2. To showcase the results of the various projects;

3. To promote telecollaborative projects and increase participation by reaching a wider audience; and

4. To act as a new medium for the development and implementation of telecollaborative projects (this purpose was only achieved later – after the development of the Québec English Schools Network).

By late in the summer, the small sites that I had created for Math, Professional Development and the ABEE were being hosted within the Small Schools Network site that Christiane Dufour was developing, which itself was hosted by GRICS. The Internet was not going away, and it was clear that the demand for information and materials on the web would only increase. There was also a sense that the English community needed its own home on the web. There was the desire on the part of the anglophone community to make its presence felt in the larger context of Québec. Secondly, much of what was available was translated or

adapted from what was being developed in the French sector or in other provinces. There was very little home grown teaching material, but the community wanted resources and support that were created and developed specifically for them. As a group we began to discuss the issue. It was decided that we should explore the possibility of setting up our own server.

The biggest barrier to operating our own web server was cost. The cost of a full-time, dedicated Internet connection was prohibitive (more than $1000/month). Even a hosting arrangement with an established Internet service provider (ISP) was very costly. The hardware and capital costs alone of running the site would make it difficult to provide the human support needed to make the site a success. Deborah Gross began to look for other partnerships that could be established. She turned to Ken France, who at the time was the *Centres d'Enrichissement de Micro-informatique Scolaire* (CEMIS) animator for the District of Bedford School Board. Mr. France, along with Ms. Gross, had collaborated on projects and at conferences with French colleagues in the Montérégie region. Ms. Gross asked me to meet with Mr. France and Michel Arcouet, who was the CEMIS animator for the Commission Scolaire des Cantons de l'Est in Granby. Michel and some of his

colleagues based in St-Hyacinthe were at the cutting edge of Internet technology, and it was hoped that we could benefit from their experience.

I met with Ken France and Michel Arcouet, who quickly offered to host our web site. He had plenty of Internet bandwidth at his board and was willing to accommodate our server at minimal cost in exchange for some of my technical services and access to our server. We still needed an actual machine, but that problem was soon solved. François Matte, who worked for GRICS and for the Commission Scolaire de St-Hyacinthe, was changing jobs and offered to sell us a Power Macintosh that he had recently set up as a server.

In mid-October, Deborah Gross and I travelled to Granby to set up our new server. We were very excited at the prospect of having our own server. On a personal and professional level, I relished the opportunity to develop new skills and try out new ideas. Once the server was in place, we had to decide on a name for the site and establish a domain name. It was originally proposed that the site be called "The AngloFiles" – a play on *anglophile*, but for various reasons (including political ones) it was decided that a less 'cute' name would be more appropriate. The people at SCA-DPP finally decided to adapt the Small Schools Network name, since it was already somewhat familiar to teachers around the

province. The final name that was decided on was the Québec English Schools Network (QESN).

Once the server was 'on-line' and the name had been chosen, the next few weeks and months were very hectic as Christiane Dufour and I worked to build a site structure and to publicize the site. Moving, or changing the address of a web site is very much like moving house in that the users of the site must be informed of the new address. We had to ensure that the site housed at the GRICS would continue to work for a time but that users would be informed that there was a new address. This also meant that for a period of time the entire site would have to be updated at both locations.

The site was growing but was incomplete. The Small Schools Network had been a self-contained entity that catered to teachers at the elementary level. It modelled a particular project-based approach to classroom learning. To it we had added some professional development grant information and resources for Mathematics 216. To us it seemed inevitable that the site would grow to include other courses and fields of study. However, even the content that was on the site was unfinished. In the planning stages for the math site, I had made provisions for a variety of different support options, but not all of them had been developed yet because the content didn't yet exist, and it was unclear

who would provide it. The Mathematics Teaching Resource Centre was full of "Under Construction" icons and "Coming Soon" banners. I attended every MAPCO meeting in order to 'sensitise' the members to the need to nourish the site. However, Laurent was very conscious of not going too far ahead too quickly, and so my opportunities to 'market' the site were limited. As described previously, my role was to develop ideas, but not actually implement them until the committee was ready to move in that direction.

Unfortunately, because MAPCO already had a full plate in implementing new programs and addressing the discrepancies in math examination results, it was clear that the web site was not a priority yet. As such, many of the areas that I had developed with Christiane Dufour for the first iteration of the site remained undeveloped during the first year of the new Math 216 program. After many weeks of struggling to create content, Laurent instructed me to remove many of the links from the site out of concern that an underdeveloped site would turn off potential users. Any reference to any part of the site that was still under development was removed, and effort was turn towards developing the parts of the site that we had content for, namely textbook support and announcing new in-service sessions for teachers using the new program.

Structuring Web-Based Content to Meet Audience Needs

It was only in the second year of development that the Math site, and indeed the rest of the QESN began to develop. At the end of the first full school year during which the site was active, Christiane Dufour and I decided to look at ways of unifying the structure of the whole site. Essentially she and I collaborated on various projects, but worked autonomously to develop "our" parts of the site. Since we each had our own particular design style, the interface of the site (i.e. the navigation, organisation, etc.) varied depending on where a user clicked. Since each part of the site had been developed in isolation (albeit by the same two people), this lack of consistency was understandable. However, if the site were to continue to grow (and we assumed that it would), then the overall uniformity of the site would have to be increased.

Together we examined sites to see what worked and what didn't. With the upsurge of the WWW, it was not difficult to find examples of either. Sites that organized their content in specific topic or service areas impressed me. A good commercial (i.e. "Dot-com") site typically has a menu system with links to an area for products and services, another section for customer or technical support, yet another section for company info, contact information and press releases. Sometimes the

groupings were clearly delineated; sometimes areas were not so well defined.

Eventually, we settled on a web design loosely modelled after a commercial site, that of Adobe Systems. Our rationale for choosing this particular model was the fact that the initial choices presented to users were simple and easily identifiable. In addition, the basic navigation for the entire site appeared on the top of *every* page on the site. This method ensured that users would always be able to find their way back to either the main home page of the site, or to the top level of each section of the site. Given the fact that content was being added to the site constantly from disparate sources, it was thought that this would be the best way to manage content and guide people to what they were looking for.

Once a design template for the QESN was established, the site began to grow at a quicker pace. New parts of the site serving different subject domains began to be added. The addition of new sites for Science, History, English Language Arts and French Second Language was facilitated by the experience that we had gained in establishing Math site and the Project Centre (which carried on the telecollaborative work of the Small Schools Network). At this stage, the "telecollaborative" projects began to incorporate and adapt the work of Judi Harris, who pioneered

constructivist approaches to using the Internet as a tool for learning using a collaborative, project-based approach (Harris, 1998). At this stage, new people joined our team and my role shifted to other projects and that of a facilitator and technical advisor on the various parts of the QESN web site.

Web Site Structure

The World Wide Web is a communications medium similar to radio, television or print. As such, one has to be well aware of the potential as well as the limitations of the medium. Just as importantly, the web developer must always be extremely mindful of their audience. This is particular important in the web medium because there is a certain basic level of technical skill that has to be mastered in order to use the Internet. This is something that many web developers do not pay enough attention to. The web is part of a particular 'family' of media known as hypermedia. Based on hypertext, the ability of the user to link from site to site on the WWW at the click of a mouse creates enormous possibilities. The power of the medium has been enhanced since the early days of text-based web browsing with the addition of media rich content. This content includes movies (e.g. RealPlayer, QuickTime, Windows Media, etc.) and interactive programs (Shockwave, Flash, Java applets, etc.). However, those who jump quickly on Internet bandwagons

often ignore evidence which suggests that the complex, interconnected, non-linear nature of the World Wide Web can result in cognitive difficulties for many users (Jonassen, 1988).

Hypertext as a concept has been with us since long before the Internet, originating in the 1940s with Vannevar Bush, who was Director of the Office of Scientific Research and Development during the administration of U.S. President Franklin Roosevelt. It need not be computer-based and can be composed of completely unstructured information with associative links between each node (page or screen). Nodes containing related information are linked to each other to create a complex web. The connections between nodes can be accessed randomly or, in the case of structured hypertext, in a more controlled fashion. In structured hypertext, links between nodes are grouped into sets according to content. In this type of hypertext, each set is accessible from a menu, and each set contains its own internal link structure that may or may not be directly accessible from other sets (Jonassen, 1989).

Jonassen (1988) also questions how a user would be able to navigate unstructured hypertext. He suggested that users might easily encounter problems finding relevance in hypertextual material and relating it to their own knowledge structure. The ability of a person to successfully navigate hypertext relates closely to Spiro *et al.*and their theory of

"cognitive flexibility" as it pertains to an individual's facility at building their own knowledge schema (Spiro, Feltovich, Jacobson, & Coulson, 1991). The authors wrote about the particular challenges of learning in a hypermedia environment, especially when faced with ill-structured knowledge domains. An inability to "see the big picture" in terms of structure can create enormous problems in terms of using hypermedia to achieve well-defined objectives. In the context of the QESN, though much of the content was designed as reference and support material, users unaware of the basic structures in place might not be able to successfully navigate to resources that would be of the most use to them.

In the case of the web, varying levels of technical skill and comfort with the technology also compounds issues. A key strength of hypermedia is the ability to create structures that allow learners to build their own knowledge structures by navigating in a non-linear free form manner. This facilitates a kind of discovery learning in which users can explore ideas and digress or branch off into areas that interest them. Locatis *et al.*(Locatis, Letourneau, & Banvard, 1989) suggest that hypertext is particularly well suited to presenting information that is "inherently non-linear, easily modularised, used for reference or browsed frequently." Unfortunately, for other learners the lack of structure leaves them cognitively "lost." Digressions or deviations from a well-trod path result

in confusion and do not contribute to the development of knowledge. Put in simpler terms, for some learners hypermedia contributes to knowledge by allowing them to explore on their own and build schema in a constructivist manner. Others (*e.g.* learners who have weak metacognitive skills) seem not to benefit from the ability to do this, and without some structural guidance become lost in the non-linear structure of the medium. Locatis *et al.*view navigation as a particular problem when content is part of an ill-structured domain.

The implications for web developers, especially those who develop educational content are enormous. In the process of meeting with teachers and delivering inservice on the use of technology, we discovered that the educational community in Québec is extremely heterogeneous in terms of skills and comfort level with information and communications technologies (ICT). In fact, the majority of teachers we worked with needed a great deal of technical and pedagogical support (at least initially) in the use of the Internet. The challenge is to create sites that allow teachers and learners to develop their skills in a variety of different knowledge domains but in a way in which the technology itself enhances rather than hinders the learning process. In a nutshell, the developer needs to leverage the strengths of hypermedia against the need to keep things as simple and linear as possible.

In the case of the Québec English Schools Network, it was as important to keep things as straightforward as was feasible because the site was going to be used to provide services, not just value added content. In the long term, the site was intended to replace or supplant traditional forms of delivering support, and as such it was important to make the site as accessible as possible.

In 1996, when the Québec English Schools Network was first established, few schools in the province had regular or widespread Internet access. It was only in 1996-97 that the provincial government began a massive expenditure to purchase hardware and networking equipment for Québec schools. The irony was that though funds were allocated to hook schools up to the Internet, no money was being specifically earmarked for professional development in the uses of ICT. It was left up to the school boards to provide training as part of their in-house professional development programs.

Building a Québec Community through E-mail

During the first few months of the QESN's existence, we were also developing other services to allow people to communicate and collaborate across the province. As described previously, the Small Schools' Network had been built on e-mail communication. The website was there to provide the basic information and support tools to get teachers started

with project-based class endeavours, and it would also showcase the results. However, there needed to be ways for teaching professionals to collaborate in a more synchronous fashion. Since many of the teachers who had been participating in the SSN were familiar with e-mail, it was logical that we continue to use it extensively. We installed listserv software on our server in order to be able to distribute messages to large numbers of people throughout the province.

At this point we realized that we were dealing with two distinct audiences: a core of teachers at the primary level who, while not technologically sophisticated, were comfortable with e-mail and ready to share with their colleagues; and an entirely new group of teachers from the high school level, the majority of whom had never used the e-mail before. As mentioned previously, we hoped to "kick start" things for the high school teachers by providing some on-line animators to provoke/facilitate/promote discussion.

Our hope was to use e-mail to create a "social space" in which teachers would feel comfortable communicating with their peers about the issues that they faced in the classroom (Harasim, 1993). Harasim writes that networks can be a fertile place in which to discuss common issues among teachers. The added advantage is the ability to transcend distance. The asynchronous nature of the medium allows flexibility and

accommodation for teachers' varying schedules and workloads. In the case of the QESN RÉCIT, these issues might be related to the implementation of new programs. However, discussion and collaboration might also focus on the use of technology in their teaching practice. For the math teachers, this might range from the use of graphing calculators, to the exchange of useful Internet sites that helped students (and their teachers) visualize or understand concepts better.

The challenges of building a sense of community and a rich learning environment in cases where both physical distance and time are an issue are several-fold. On a basic level, there are the technical challenges of getting people on-line and training them to use the technology. On another level are the challenges of building a community of professionals without the benefit of face-to-face contact. For teachers in the Anglophone sector in Québec, their only opportunity to interact as a group occurs once a year for a 24-hour period.

During the first few months, discussion on the "MathChat" list was spotty at best. Our observation was that most of the teachers who subscribed to the list were not accustomed to collegial exchanges about pedagogical topics. The culture of sharing was slow to develop, especially at the high school level. Activity on the list (and other lists devoted to various fields of study) was low, punctuated by bursts of activity at

certain times of the year. Exchanges on the listserv were sometimes prompted by a subject specific question, but they often dealt with "administrivia." It was helpful to have our group of moderators and other participants on the list who would help things along by 'seeding' questions or by making provocative statements to provoke discussion. Some examples of the kinds of exchanges that occurred can be found in Appendix E.

Riel and Levin (1990) discuss the challenges of building "electronic communities." In their study, the authors studied a number of cases of computer-mediated communication being used to connect teachers and learners. Not all cases were successful, and the authors were able to categorize determining factors by organizing the structure of participation in CMC into five distinct categories:

- Organization of the network group;
- Network task organization;
- Response opportunities;
- Response obligations; and
- Evaluation and coordination.

The authors conclude that groups with common objectives and interests tended to be the most successful, especially if CMC was the most efficient way to remain in contact. Computer-mediated communication was most successful if there was a "defined task or objective" that necessitates the use of CMC Easy access to the network and a protocol to oblige and/or encourage response also increase the chances of success. The authors suggest that an extra motivating factor is incorporating on-line participation into evaluation of learning outcomes. Another key factor is the presence of an on-line leader or moderator to facilitate discussion and keep things on task.

Daley *et al.*(2001) found that learning is strongly influenced by technology and other factors of the learning experience. Their results showed that if participants (i.e. learners) felt that using the technology was time-consuming or if there were too much of a lag time between on-line discussion responses, then their experience would be viewed as "negative or insignificant." On the other hand, if learners viewed the time aspect of the technology as "allowing opportunities for reflection" then the learning was viewed more positively. Most significantly, the authors found that positive outcomes were more likely if learners/participants engaged with the technology in the learning process, rather than as a way to frame learning.

Heflich (1998) writes that the use of CMC expands teachers' boundaries by allowing them to interact with colleagues, school offices, experts in various fields and parents. While acknowledging this, the author also points to an Office of Technology Assessment study that showed that in the U.S., as in Canada, training in the use of technology was not keeping pace with the purchase and installation of new hardware in schools.

The modest success of the MathChat mailing list within the QESN did not translate to lists that were later set up for other subject areas like Science, Social Sciences or French Second Language. The key difference between the mathematics experience and subsequent efforts in those other subject areas was that far more effort was made at the front end of the process to ensure that CMC would be successful. The fact that moderators were actively recruited and trained and that the list was closely monitored and nurtured from the outset played a big role in getting members of the community to use the list.

Lists that were later established for Science, History, Kindergarten and Inclusive Education did not benefit from such an extensive initial effort. Although all of the lists had moderators, they in most cases had no prior training. The principles that had been applied to the MathChat list, those of creating incentives to or implying an obligation to respond were not followed through on other lists. In some cases, this was due to

differing group dynamics amongst the assorted subject areas. It was observed that each subject area had its own professional "community" and that these various groups were heterogeneous in terms of skills and willingness to use technology. In some cases, there was resistance to using CMC as a way of collaborating or obtaining support.

Selected examples of web-based education communities

Any examination of an Internet site such as the Québec English Schools Network should not be done in isolation. As such, a brief review of four selected educational web sites follows. The sites were chosen because they provide professional support to teachers and are in some ways similar in goals and purpose to the QESN. These sites provide some comparisons as well as examples of what is going on in other parts of the world. When the QESN was created, there were few examples after which it could model itself. There are several reasons for this:

1. The Québec English Schools Network, as was described earlier, was developed to address specific needs in a given time frame. There was limited opportunity to research similar examples in advance of development.

2. The resources and funds were not available to develop anything on the scale of what was being done elsewhere, especially in the United States. While sites like the Global Schoolhouse and Web66 served as models for some of the content on the QESN, the site could not hope to match their approach in terms of breadth and depth.

However, there are numerous examples on the Internet of sites whose approach, while not identical, is similar to that of the QESN.

TAPPED IN

The title of the site, TAPPED IN, is short for Teacher Professional Development Institute. This site operates on several levels. Firstly, it provides a central location for teachers to meet virtually and discuss issues facing them in their practice. Secondly, it offers practical tools that teachers can use in the classroom as part of their professional practice. Thirdly, the site provides a calendar of relevant professional development activities and articles about various aspects of teaching practice. Finally, the site provides links to other resources on the Internet that might prove useful. As with other sites of this type, TAPPED IN uses a campus metaphor, with the different areas of the site corresponding to locations on a campus (*TAPPED IN*, 2001).

The use of CMC on the Tapped In site is both synchronous and asynchronous. When visiting the Tapped In site, a user can chat with other teachers in the various "rooms" that make up the campus. However, it is also possible to communicate asynchronously with other through bulletin boards or mailing lists.

WINGS Online

The acronym, WINGS, stands for Welcoming Interns and Novices with Guidance and Support Online. Developed at the University of Texas at Austin, this site focuses on enhancing teacher professional development through a process called telementoring. The approach is spearheaded by Judi Harris. Harris is well known for developing curriculum-based telecomputing and, more specifically, telecollaboration. The WINGS Online site demonstrates and applies mentoring models (*WINGS Online*, 2002).

Inquiry Learning Forum

The Inquiry Learning Forum (ILF) is an online community of K-12 math and science educators based at Indiana University. It encourages communication and sharing of ideas and resources amongst practising and pre-service teachers. The ILF promotes inquiry-based, learner-centred classroom environments. The ILF site uses the navigation

metaphor of a school. The site is divided into areas that have the same name as the equivalent physical part of a school. One key feature of the ILF is something called an Inquiry Cycle, through which a group of teachers "reflect upon, discuss and improve their teaching." (*Inquiry Learning Forum*, 2000)

Te Kete Ipurangi – The Online Learning Centre

Te Kete Ipurangi (TKI) is a bilingual site developed by the New Zealand Ministry of Education. The site content is in both English and Maori, the language of the aboriginal population in New Zealand. The goal of the site is to provide the education community in New Zealand with support in the implementation of new curricula and general professional development. Resources are available in a variety of different subject areas and educational themes. The site is divided into "communities," each corresponding to a different part of the curriculum (*e.g.* Math, Science, Language Arts, etc.). Interaction is in the form of discussion forums (asynchronous) in which users can participate (*Te Kete Ipurangi - The Online Learning Centre*, 2002).

The TKI performs a parallel function to the Québec English Schools Network RÉCIT in that a large part of its audience belongs to a minority language group. The size of the target audience in New Zealand mirrors that of the English community in Québec.

User Survey and Web Site Usage Statistics

Web Site User Survey

A survey was conducted of 80 users of the QESN RÉCIT website. The sample for the survey was obtained from subscribers to subject and resource-specific listservs operated by the QESN RÉCIT. Participants were invited to participate in the survey by visiting a web site that had been designed for that purpose. An identical message was distributed to each of the lists referring users to a web site where the survey was administered. The web site address sent to each mailing list was unique, so that it would be possible to track what subject area(s) the responses were drawn from. Data was collected over a two-week period in February 2002. The survey measure consisted of eighteen individual items in a mixture of multiple choice, Likert scale and brief open-ended questions. Roughly half the items consisted of general questions regarding participants' use of the Internet. The rest of the questions addressed participants' use, attitudes towards and comments about the QESN RÉCIT site. The complete results of the survey, including answers to open-ended questions, can be found in Appendix A.

Survey Results

A total of 82 people participated in the web-based survey. The results of the survey in its entirety are reported in tabular form and can be found in Appendix A. Of the respondents, 10 (12.2%) did not complete the required portion of the survey.[3] Respondents were asked about their occupation. Of the total, 51 individuals (62.2%) were practicing teachers, 12 (14.6%) were consultants (pedagogical or other). The balance of the participants was made up of other education-related occupations (12, 14.6%), administrators (3, 3.7%), students (2, 2.4%), a parent (1 respondent, 1.2%) and one individual who did not work in education.

Respondents were also asked to describe the location(s) from which they accessed the Internet. Of the total of 81 responses, 65 (80.2%) reported that they accessed the Internet from home, 42 (51.9%) connected to the Internet at school, 24 (29.6%) from their office, while another 6 (7.4%) individuals reported accessing from a library or other location.[4]

Of all the respondents, almost half of those who were aware of the bandwidth of their access (34, 48.6%) reported having high speed or broadband access. The other 36 (51.4%) respondents had telephone modem access, with a slight majority of those (20, 55.5%) having 56 Kbps or ISDN modem access.

The bulk (77, 95.1%) of survey participants reported having a version 4 or higher browser (either Internet Explorer or Netscape Navigator), suggesting that most web site content (i.e. JavaScript, Java applets) was accessible to them.

Another question asked respondents about what plug-ins they had installed in their browser. This information is key because some of the site content is only available in formats that require the addition of plug-ins. Of the 80 respondents to this question, 76 (95%) reported having Adobe Acrobat Reader installed on the computer they used. RealPlayer and Apple QuickTime plug-ins could be found on the computers of 59 (73.8%) and 56 (70%) respondents respectively. More than half of the respondents also reported having Shockwave and/or Flash plug-ins (56.2% and 53.8% respectively).

Most participants (55 or 68.8%) described themselves as intermediate Internet users. Another 24 (30%) were self-described experts. Surprisingly, only one respondent (1.2%) professed to be a beginner. A clear majority 71 of 80 respondents (88.8%) reported that they used the Internet on a daily basis. Another eight participants (10%) used the Internet "several times a week."

Participants were also asked about specifics of their everyday Internet use (Table 1). The majority (75%, 59) reported using the Internet most often for E-mail as well as accessing the World Wide Web (67%, 52). Some users also reported that they rarely or occasionally used other Internet technologies such as newsgroups, streaming media and music downloads, but only a small minority of users actually accessed features like chat or Internet telephony. The data suggests that a majority of users did not go beyond e-mail and web use.

Question: For each Internet use below, please check the box that best describes how you use the Internet.

	Never	Rarely	Sometimes	Regularly	Often	Response Average
E-mail	0% (0)	0% (0)	1% (1)	24% (19)	75% (59)	4.73
Newsgroups	47% (37)	20% (16)	16% (13)	14% (11)	3% (2)	2.05
Chat	58% (46)	23% (18)	10% (8)	8% (6)	1% (1)	1.71
World Wide Web	1% (1)	0% (0)	1% (1)	31% (24)	67% (52)	4.56
Internet Phone	91% (71)	8% (6)	1% (1)	0% (0)	0% (0)	1.09
MP3 download	52% (41)	23% (18)	19% (15)	5% (4)	1% (1)	1.81
Streaming video/audio	32% (25)	25% (20)	30% (24)	13% (10)	0% (0)	2.24
					Total respondents	79

Table 1 – Respondents' Use of the Internet

Participants were asked how they found out about the QESN RÉCIT. Of the 78 people who responded to this question, 27 (34.6%) reported that they learned about the QESN through a workshop. Another 25 (32.1%) learned of the site through a colleague. Sixteen respondents (20.5%)

reported learning about the site through another non-listed method, while 9 (11.5%) found the site via an Internet search. Only one respondent discovered the site because of a promotional poster or bookmark.

When asked to categorize how often they visited the site, just over half of the 78 respondents (40, 51.3%) reported that they visited the site once or twice a month (somewhat regularly). A majority of the other respondents reported that they visited the site more frequently, with 17 (20.8%) reporting accessing the site once or twice a week and 14 (17.9%) reporting three or more visits per week. Only seven respondents (9%) reported visiting the site less than once or twice a month.

The next question in the survey asked about the specifics of respondents' use of the QESN RÉCIT site. Respondents were asked about the frequency with which they availed themselves of the various resources on the site. The results of this question are detailed in Table 2.

In each case below, please choose the term that best describes how you use the QESN RÉCIT						
	Never	**Rarely**	**Sometimes**	**Regularly**	**Often**	**Response Average**
Read/download subject resources	8% (6)	13% (10)	34% (26)	**36% (27)**	9% (7)	3.25
Register for collaborative projects	**63% (47)**	13% (10)	12% (9)	9% (7)	3% (2)	1.74
Use sample exercises/activities	18% (14)	18% (14)	**39% (30)**	21% (16)	3% (2)	2.71
Find projects or lesson plans	21% (16)	17% (13)	**38% (29)**	16% (12)	8% (6)	2.72
Look up information about professional development grants and funding	**38% (29)**	17% (13)	30% (23)	11% (8)	4% (3)	2.25
Use special needs resources	**47% (36)**	25% (19)	18% (14)	7% (5)	3% (2)	1.92
Subscribe to mailing lists (listservs)	25% (19)	20% (15)	**32% (24)**	14% (11)	9% (7)	2.63
Contact Ministère de l'Éducation	**68% 51**	15% (11)	12% (9)	4% (3)	1% (1)	1.54
Use sample exams	**42% (32)**	8% (6)	30% (23)	17% (13)	3% (2)	2.30
Obtain assistance with new programs	**33% (25)**	19% (14)	**33% (25)**	12% (9)	3% (2)	2.29
Download study guides	20% (15)	16% (12)	**34% (26)**	24% (18)	7% (5)	2.82
Use multimedia simulations (OhmZone-Powerhouse)	**67% (51)**	17% (13)	12% (9)	4% (3)	0% (0)	1.53
Use portfolio resources	**50% (38)**	14% (11)	26% (20)	8% (6)	1% (1)	1.96
Discuss common issues with colleagues	**41% (31)**	30% (23)	17% (13)	11% (8)	1% (1)	2.01
Contact RÉCIT animator(s)	**71% (54)**	12% (9)	12% (9)	3% (2)	3% (2)	1.54
Register for Linguistic Exchange Program	**95% (72)**	1% (1)	4% (3)	0% (0)	0% (0)	1.09
Use French Second Language Resources	**77% (58)**	7% (5)	8% (6)	5% (4)	3% (2)	1.47
Look up information about upcoming events	14% (11)	17% (13)	**39% (30)**	28% (21)	1% (1)	2.84
					Total respondents	76

Table 2 - Nature of website use

The results of this item show that of the 76 respondents, most respondents spent more time using resources that were downloadable, such as documents, study guides and lesson plans. Of all of the content

on the site, the most frequently used were the subject-specific resources. A total of 53 (70%) respondents reported reading or downloading subject resources "regularly" or "sometimes." Similarly, 46 (60%) survey participants reported used sample exercises and activities either sometimes or regularly, while 41 (54%) used the site to find projects or lesson plans. A total of 33 (46%) off users stated that they subscribed to listservs sometimes or regularly. Similar numbers were reported for downloading study guides and obtaining assistance with new programs. It should be noted that most of these activities apply primarily to the secondary level.

Web site resources that require collaboration, interactivity or discussion appear to be those that were used the least. Of the 76 respondents, 57 (76%) reported that they never or rarely registered for collaborative projects. Similarly, 54 (71%) subjects reported that they "never" or "rarely" discussed common issues with colleagues, while 63 (83%) never or rarely contacted their RÉCIT animator and 62 (83%) never or rarely contacted the Ministry of Education. The results of the survey showed even less use of Linguistic Exchange and French Second Language resources, but this may be due to the fact that French Second Language / Immersion specialists were not targeted as part of the survey.

Table 3 shows the responses to a question on attitudes towards the web site. The question was intended to elicit evaluative feedback as well as obtain insight into the attitudes of users towards the various uses for the web site. Of 72 respondents to this question, 66 (92%) reported that the web site resources were "useful and relevant." Fifty-one subjects (71%) stated that communicating with other professionals was important to them, and 39 (54%) agreed that their use of the web site had "improved" their teaching. Similarly, 56 (78%) of the respondents felt that collaborating with other teachers, either in their own school or another was important to them, and 69 (96%) believed that teachers should share their resources. According to 46 (64%) of subjects, the resources on the site had helped them to improve student performance.

Please read each of the following statements about the QESN RÉCIT website carefully. For each statement below, check the appropriate box to indicate to what degree you agree or disagree.						
	Strongly Agree	**Agree**	**No Opinion**	**Disagree**	**Strongly Disagree**	**Response Average**
Resources are useful and relevant to me	32% (23)	**60% (43)**	6% (4)	3% (2)	0% (0)	1.79
Information is difficult to find	3% (2)	22% (16)	21% (15)	**44% (32)**	10% (7)	3.36
There are too many choices. I don't know where to start.	7% (5)	6% (4)	28% (20)	**44% (32)**	15% (11)	3.56
Communicating with other professional educators via the website is important to me.	24% (17)	**47% (34)**	18% (13)	8% (6)	3% (2)	2.19
Using the website has improved my teaching.	15% (11)	**39% (28)**	36% (26)	7% (5)	3% (2)	2.43
It is easy to find what I am looking for on the site.	11% (8)	**58% (42)**	15% (11)	14% (10)	1% (1)	2.36
New material is posted on the site in a timely fashion.	14% (10)	**49% (35)**	29% (21)	7% (5)	1% (1)	2.33
The resources I have downloaded have helped me to improve student performance.	11% (8)	**53% (38)**	33% (24)	3% (2)	0% (0)	2.28
Collaborating with other teachers, whether in my school or another, is important to me.	36% (26)	**42% (30)**	18% (13)	3% (2)	1% (1)	1.92
Teachers should share their resources.	**57% (41)**	39% (28)	1% (1)	1% (1)	1% (1)	1.51
The website is irrelevant to my needs.	1% (1)	7% (5)	7% (5)	**45% (32)**	39% (28)	4.08
There are better resources to be found elsewhere on the Internet.	4% (3)	18% (13)	**52% (37)**	23% (16)	3% (2)	2.97
					Total respondents	72

Table 3 - Attitudes towards web site use

With respect to navigation and use of the website, information on the site was difficult to find for 18 (25%) of respondents, but 43 (59%) disagreed with this statement. According to 50 (69%) participants, information on site was "easy" to find, while 11 (15%) disagreed with this statement. Subjects were asked whether they agreed that the number of choices

made using the site confusing. Nine (13%) respondents agreed with this statement, while 43 (59%) disagreed. A total of 6 (8%) of respondents agreed with a statement that the site was "irrelevant" to their needs, while 60 (84%) disagreed. When asked they agreed with the statement that better resources were available elsewhere, the results were inconclusive, with 37 (52%) reporting no opinion.

The survey also contained some open-ended questions that solicited opinions about what improvements or changes could be made to the site, the quality of the existing resources and directions for the future development of the site. These questions were optional and were only answered by between 9 and 25% of respondents. However, they did elicit some interesting comments. One respondent suggested that the site should have "more opportunities for teachers (and perhaps students) to contribute." The biggest single demand in terms of improvements was for "more old exams and test questions as well as activity exercises." There were also those who requested more resources in specific subject areas, especially math and science.

Some users suggested that an index of what is available on the site would be useful. Similarly, a complaint that stood out was one of a lack of time to be able to find the appropriate resources on the site. A couple of other respondents called for a better search tool on the site (currently

a third party search engine called "WhatUSeek" is used to enable visitors to search the site). Another suggested "fewer clicks to reach desired info." Several survey participants suggested that virtually the entire site should be accessible from the home page through the use of pop-up menus.

Discussion

There are some interesting observations that result from examination of data from the preceding survey. When asked about their attitudes towards the site and its underlying goal (to build a community of learners), the majority of respondents expressed themselves to be strongly in favour of collaboration and sharing. Yet when the same users were asked about their actual use of the site, a minority of respondents actually participated in collaborative activities like telecollaborative projects or collegial exchanges. Whatever the causes of this discrepancy, it leads one to question how successful the QESN RÉCIT has been in developing a community of practice.

In order to explain the difference between value and action (or perhaps "espoused theory" and "theory-in action?" (Schön, 1987)), one could speculate that while teachers held those values in principle, it was much harder to engage them in practice. This may be due to time constraints

of teachers' schedules or other factors. The fact that Quebec teachers were engaged in a labour dispute at the time that the survey data was collected may also be a factor. The causes of the discrepancy may, in fact, be far more prosaic. Novice Internet users are often reticent about engaging in online social exchanges. There is a lack of comfort with the technology itself, which may make teachers uncomfortable with the idea of using computers to communicate (or as tools in their classrooms). Related to this is a possible fear of social embarrassment caused by a lack of computer savvy. Technology aside, some teachers may avoid collegial exchanges for fear that it will expose inadequacies in their professional skills.

Another explanation for this phenomenon may be the sample used in the survey. The sample was drawn from subscribers to the various listservs operated by the QESN RÉCIT. Although every attempt was made to recruit participants from a cross-section of users in terms of both field of study and grade level, the majority of respondents were math or science teachers and consultants. The composition of both of those sets of web site users is primarily from educators at the secondary level. The QESN RÉCIT's collaborative resources tend to target the earlier grades more. This is because of time factors and also because teachers at the elementary level have more latitude to engage in these kinds of activities

within their classroom. Had respondents to the survey reflected a more balanced overall sample of the QESN RÉCIT's audience, the results in terms of actual collaboration and sharing amongst educators might have been different.

It should be observed, however, that the bulk of overt listserv communication occurs amongst that same community of math and science practitioners, albeit on a less frequent basis than ideally desired. As mentioned earlier, the history of the QESN listservs has been a combination of periods of activity followed by long periods of silence. Gongla and Rizzuto (2001) describe various stages in the evolution of communities of practice. The authors define the five basic stages as being Potential, Building, Engaged, Active and Adaptive. Each stage defines different roles and levels of engagement among community members. While they see a definite progression from stage to stage in the evolution of the community, they refrain from making value judgements about the level of engagement at any given level. One key point that they make is that not all communities of practice attain all of the stages. Some communities dissolve before reaching the later stages. Other communities achieve a particular stage of engagement or participation for the time needed to meet specific needs or an objective, and then revert back to one of the earlier stages. In the case of

participation in the QESN, the community appears to move between the Potential and Building stages. It is possible that given the context of large geographic distances, busy schedules and heavy teaching demands, peripheral participation in the community only occurs as needed. It is also possible that more animation, whether on listservs or for specific projects, might help move the community beyond the building stage.

Another aspect that should be noted about the methodology of the survey is that it would be difficult to gather the opinions of people who were extremely dissatisfied with the site. This is because the method that was used to collect the sample by definition probably *excluded* people who never used the site at all. Such individuals would have been virtually impossible to recruit unless the survey sample had been drawn from a random sample of the anglophone teaching population at large. Respondents' feedback about the usability of the site is particularly germane as it relates to the future development of the site. As a site becomes larger, it becomes unwieldy. The volume of content and the number of different areas on the site necessitate that users make choices in order to find what they want. This can be an issue for people who have trouble navigating the web. Although there was not a great deal of specific feedback about this in the survey results, some answers point to

a problem in navigating quickly enough to the desired information. Indeed, one of the biggest complaints in the past, albeit informally, from users about the QESN has been that it takes too many steps to get to the right page. However, attempts to bring the core content of the site closer to the surface result in complaints about clutter and information overload.

Special challenges face web developers who must create sites with content from disparate sources. In an organisational, corporate or institutional environment, the Webmaster's task is made simpler by the fact that the corporate identity is consistent throughout the organisation. Creating a site structure that models the organisational hierarchy is not necessarily easy, but at least there is a structure to begin with. In the case of an educational 'portal' or clearinghouse like the QESN, structure is much harder to define and consistency more difficult to attain. This is exacerbated by the fact that different parts of the site address diverse needs and are aimed at discrete audiences. In addition, different individuals with various approaches and 'styles' are developing the various parts of the site. The challenge is to create a framework or site navigation system under which everything can fit.

In the face of heterogeneous content there are a number of different means that a web developer can use in order to make their site(s) easier

to navigate. One method is by insisting that particular key navigation features appear on every page, no matter what the content of the page. This approach creates a certain visual consistency and makes it appear that the content is more integrated with that of the larger site than it might actually be. It also ensures that users are always able to return to the main homepage or to major parts of the site no matter where they navigate. This is particularly important for those users who find the web cognitively difficult to negotiate. A commonly used strategy is to show a menu of the main sections of the site. One might find text at the top of a page indicating not only the title of the page, but the section and subsection within which the page lies. The reasoning for doing this is to illustrate not only where the user is in the site hierarchy, but also where they have been. This functions as a virtual "bread crumb" trail to allow the user to find their way back to where they began. This is particularly useful for users who are pulled off topic or track by the non-linear nature of the hypertext and need a reference point to which to return.

Another commonly used method is the implementation of frames within a site. Frames work by allowing the user to view several pages simultaneously in their browser in a predetermined layout. Typically, frames are designed so that a small area of the screen is reserved for navigational links. The larger part of the screen contains the content.

Clicking on a navigational link causes the content part of the screen to change. All web browsers in the past five years have been capable of viewing web sites based on frames. A web developer can create a site frame such that the navigation 'frame' will always appear, no matter what the content pages look like. Additionally, a frame can be reserved for a site logo or graphic to create a specific identity for the overall site. Frames are particularly suited for sites that are devoted to content that is difficult to navigate, since the site structure and hierarchy can be reflected in the navigation frame. However, frames have a key drawback in that specific pages within the "frameset" (i.e. the individual content or navigation pages) are difficult, if not impossible, for the average user to access directly. Normally users can only bookmark the main page in the case of a framed site, so that each time they want to return to a specific page, they must navigate back through the site hierarchy. Many web content developers view this characteristic as an advantage, as it can be used to ensure that users follow a given path within a site, or that pages within the site are always viewed in context.

Despite the useful information provided by the survey data, there are numerous limitations inherent in the methodology of this particular survey. As mentioned in the discussion above, the survey sample was by no means random and was biased (unintentionally) towards those who

favoured the site or were regular users of it. The method of recruitment for the survey was "passive" in the sense that there was no face-to-face solicitation of participants. There was no remuneration, incentive or "value added" provided for people to participate. Furthermore, although every attempt was made to create "neutral" survey items, there is the possibility that survey questions lacked balance or tended to lead participants to respond a particular way. The survey was piloted with a small sample before being publicly administered. However, some of the people who participated in the pilot had previously been involved in the QESN RÉCIT either as project developers or participants. The feedback obtained in the pilot did not result in many changes to the actual survey.

Web Site Usage Statistics

Web server logs for the QESN RÉCIT web site were analysed using Summary log analysis software. No logs were kept for the first few months that the Québec English Schools Network web site was active, so it was not possible to analyse web site usage before April 1997. Analysis of the logs shows a steady increase in usage from 1997 through 2002. This can be seen as quarterly figures in Table 4 and monthly totals in Figure 1. The periodic decreases or dips that appear in the number of "visits" to the site are explained by low usage periods (e.g. summer vacation period, Christmas, etc.). There were also several occasions

when the web server was known to be inactive due to uncontrollable circumstances (technical problems, Ice Storm of 1998, etc.) that also affect the figures.

Quarterly Usage Report For QESN RÉCIT Reporting From April 1997 To March 2002 Shows Data For The Entire Site For Each Quarter.			
Quarter	**Pages**	**Unique Hosts**	**Visits**
Apr-97	15,422	1,908	3,062
Jul-97	16,515	2,942	4,547
Oct-97	36,755	7,102	11,950
Jan-98	61,265	12,681	18,885
Apr-98	90,028	14,378	23,553
Jul-98	152,596	13,633	27,407
Oct-98	202,784	23,104	49,445
Jan-99	189,195	24,303	57,728
Apr-99	336,543	31,295	82,023
Jul-99	390,889	21,102	57,015
Oct-99	459,630	27,858	67,516
Jan-00	520,511	42,029	115,480
Apr-00	846,941	45,705	134,066
Jul-00	382,233	36,627	107,028
Oct-00	624,855	56,856	172,164
Jan-01	563,036	60,115	177,425
Apr-01	865,208	60,099	194,666
Jul-01	603,688	56,142	174,721
Oct-01	706,425	77,347	223,893
Jan-02	361,570	44,235	120,649

Table 4 - Quarterly Web Site Usage Report

The web log analysis software measures the number of "unique visitors" to the site. It is impossible to measure the actual number of human

beings who visit the site, or to even determine exactly how many individual computers or "hosts" have requested pages from the site. However, it is possible to estimate the approximate number of "Unique Hosts" or computers that request pages from a given site. "Visitors" is defined as an estimate based on the number of requests from a unique host during a time period (Linhart, 2001). The visit is considered to have ended when that "unique host" has requested no files for an interval of 30 minutes. As can be seen in Table 4 above, the number of visits often exceeded the number of unique hosts during the period analysed. This suggests repeat visits by individuals or institutions. There are other factors that can complicate the interpretation of the web logs such as proxy servers and firewalls, which will be discussed later.

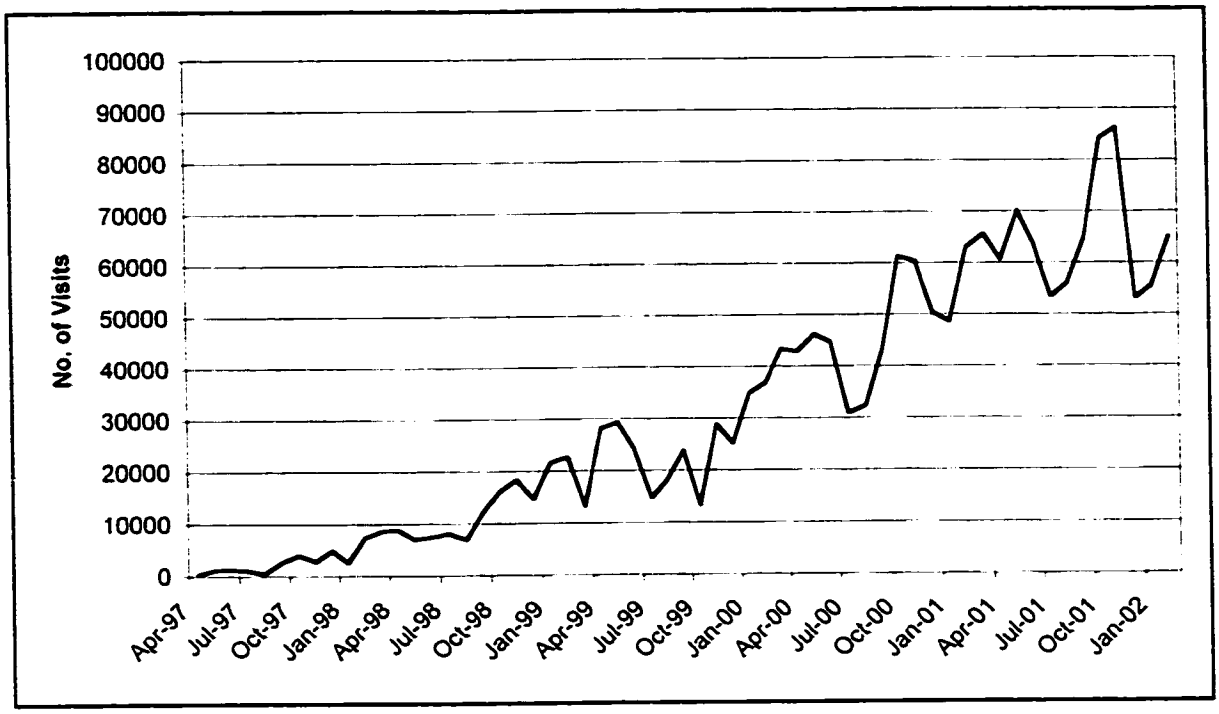

Figure 1 - Monthly Web Site Usage Chart: April 1997 to January 2002

Discussion

The collection of statistics on web site usage is problematic. While is it possible to collect data on how many times a web site or page has been visited, it is much harder to collect information on how those 'hits' translate into real usage of a site. A web page 'hit' may not be a real human being at all. Many reported hits turn out to be automated spiders that collect information of web sites for web search engines (*e.g.* Google or Altavista), directories (*e.g.* Yahoo), or for marketing companies. In effect, the only information that can be gleaned from web page counters is that a particular computer ("host") using a browser

connected to a specific page at a given moment in time. It is virtually impossible to determine with 100% certainty how much time was spent on a web page or whether the content of that page was actually read or digested by the viewer.

Web logs are the primary tool used by webmasters to track web site usage. When a user's browser requests a web address (or URL: "Uniform Resource Locator"), the web server can record several pieces of information. Among the information that can be tracked are:

- The name of the file requested;
- The size of the file requested;
- The time of the request;
- The Internet IP address of the computer making the request;
- The platform (Windows, Macintosh, etc.), browser software (Netscape, Internet Explorer) and browser version of the computer making the request; and
- The address of the page that referred or linked to the file requested (if the address of the page wasn't entered directly in the browser).

Web logs can provide a great deal of useful information. For instance, when properly analysed, the logs can provide a snapshot of who (in an aggregate sense) is visiting a page or site, since it records the originating addresses of all requests. When logs are analysed for an entire site, it can also provide useful information about which pages or files were the most frequently requested. In addition, information about file size can be used to determine bandwidth needs for a given site.

Other useful pieces of information that can be amassed from web logs are aggregate data about the number of discreet 'visits' to a site and how long those visits last. Additionally, if those visits were from the same "host" (*i.e.* originating computer), then it is possible to produce some meaningful information about repeat visits to a site. Over time it is possible to determine on average how many times an individual 'visitor' returned to the site. Combined with statistics on which pages or directories are most frequently accessed, and one can create a snapshot of site usage and the effectiveness of various parts of the site.

Software used to compile web site usage statistics is an essential tool of the trade for webmasters. In terms of accountability, web site stakeholders tend to be more satisfied with the numerical certainty of web site "hits" than user feedback. The software used to analyse the QESN web logs is called Summary, and is a variant on a standard Unix

log analysis tool called Analog. Summary provides a "friendlier" interface and better customisation with which to produce usage reports. Summary has the added advantage of parsing log data to extract information about visits from unique hosts. The limitation of the tool is the arbitrariness of visit definition. Different analysis packages may define a discrete visit differently. In the case of Summary, a visit is defined as a series of file requests from a unique host (a computer with a unique Internet address) that occur within a variable time period. A visit can occur over any length of time, but is considered to have ended, when no data has been requested for 30 minutes.

Unfortunately, web stats are purely 'mechanical' in that while they measure hits to the site, there is no way through web logs to measure whether content on a web page has been read or understood. One can make some basic assumptions based on how much time is spent on each page and return visits to a page. It should be understood, however, that it is hard to match visits with individual users because of the problems of:

- Resolving/identifying many Internet addresses;

- Determining whether the visitor was a real person or an automated web 'spider" used by many search engines and web directories; and

- Many computers (especially in companies or school boards) being masked behind a firewall and a single Internet address.

Another "Achilles' Heel" of web logs is that it is an onerous task to analyse them. Web servers can generate millions of lines of logs entries per day. There are powerful software tools that can be used to parse the logs and generate meaningful statistics, but there are some important shortcomings. Although each log entry records who visits and what they request, providing both pieces of information as a single, meaningful statistic is problematic with most of the software available because of the sheer volume of entries. Most log analysis programs break each log entry down into its components and compile statistics on those. More expensive analysis software is required to make it easier to correlate a specific computer with visits to a particular page or web resource. As mentioned above, the definition of a visit is open to interpretation (in the case of this study, we are accepting the term visit as defined by the Summary log analysis tool).

Great strides have been made in the quality and power of statistical analysis software for web logs due to the increasing need for web site owners to be accountable to their audience or their clients. Over the past several years commercial interests have come to dominate what was once an exclusively governmental/educational medium. As recent economic trends have demonstrated, the rapid investment in the Internet was not initially accompanied by a fundamental awareness of how it was being used. Investors and governments who must answer to taxpayers are now far more wary about how their dollars are spent.

In the case of the Québec English Schools Network, what was once an afterthought, the compilation of information about how the site is used, is now a necessity. Everyone who spends money on the site must account for that money and provide proof that it was well spent.

Web logs are usually very accurate, but another minor shortcoming of web logs is that some Internet addresses are untraceable. In other words, it is not always possible to convert the numerical (Internet protocol (IP) address of a computer that visits a site into a more meaningful domain name address (e.g. aol.com). The assignment of Internet addresses or domains can change over time, so that analysing older logs for user data can be problematic. In addition, large organizations such as governments, companies and school boards

usually protect their internal networks with firewalls and proxy servers. In the case of the QESN, although the web logs can indicate how much a particular school board has visited the site, it is virtually impossible to collect that information by school. Each school's usage appears under the address of the proxy server used by the school board. It is sometimes possible to obtain some of this information at the other end with the active participation of school boards. However, board IT personnel are concerned with security and privacy and it is often difficult to obtain that information without a great deal of effort and negotiation.

Another method of tracking web site usage is through the use of cookies. Browsers like Netscape Communicator and Microsoft Internet Explorer use cookies to store data about a user and to track return visits to a site. Special code embedded in the HTML code of a web page 'sets' a cookie the first time that a person visits a web page. Cookies have generated a great deal of publicity over the past few years because of fears that they constitute an invasion of privacy by storing and transmitting personal information about the user to advertisers and marketers. In practice, although cookies are used to collect marketing data, they rarely contain personal information and are used to collect aggregate or nominal data about the user and *where* they go on the web or within a site. Cookies can improve the user interface of a site by enabling the web developer to

create a personalized web page or by tracking return visits and retaining stored information selected either by the user or the developer.

As with counters, cookies provide limited information about web site usage. Although a cookie can indicate that a page was downloaded by a browser, and can track a user's navigation through the site, it cannot record in any meaningful way how much time is spent on a particular page. Nor can this kind of tracking give any indication whether the web content was read or understood. However, because the cookie is associated with an individual computer browser, rather than an Internet address, cookies can identify individual web users more precisely than can standard web log analysis.

In order to truly evaluate how a web site is used, the site owners must employ more proactive methods of gathering data. The only way to determine whether a web site is reaching its target audience is to gather information from the users themselves rather then from their computers. This can be accomplished through the use of surveys (as has been done here) or by collecting nominative information about users as a condition for using the site (through a login or some other gatekeeper). As with the other data collection methods mentioned above, each has pros and cons. Surveys have the advantage of being voluntary. They have the potential to gather data that is much more detailed and granular, many web users

do not object to surveys in principle because the information is given voluntarily and this is in contrast to more publicized and controversial methods that are far more covert and 'sinister.' A well-placed survey can be used to collect meaningful information not only about the effectiveness of communication on a website, but also on the end uses of the information made available there. The survey can also be used as a formative/summative tool to assess the success of a site and to plan modifications or improvements. The thing that limits the survey is the very thing that makes it appealing to some: the voluntary nature of the data collection. In an on-line situation, it is far harder than in a face-to-face setting to convince people to take the time to participate in a survey if there is no perceived 'payoff.' The added task of the researcher is to provide a big enough 'carrot' to draw in potential participants.

Requiring that visitors to a site log in to be able to view key information is another effective way of gathering practical data on web site usage. For one thing, user logins make it easier to link specific content on the site with the user. This is because the login information becomes another component of web log analysis. The precision of the information gleaned from logged information can be that much higher when it becomes possible to track an individuals' use of the site. When users login at a site, there is no ambiguity to the definition of a "visit." Unless

a user engages in active deception by providing his/her login information to someone else, the usage information in the log should be extremely accurate. One important statistic that can be collected is the number of repeat visits. This can be a strong indicator of whether people find the information on a site relevant and useful. In addition, web site owners can request additional information when people request log in account. The kind of information that is gathered can be similar to that which is collected in a survey, but the provision of the information is a prerequisite for accessing site content. One must be careful in this case to respect privacy concerns and allow users to withhold certain kinds of information.

The information collected can vary from basic contact information to facts about areas of interest, employment, marital status, income, etc. Commercial sites can use this information to attract advertisers or to target marketing at specific groups. For a service provider or educational site, user information can be used to evaluate and improve site content and structure to better meet needs.

As an example, the Webmaster might collect information about the level of computer literacy of visitors to the site. This could help content developers tailor content to the right skill level(s). The information might also trigger the development of specific job aids to assist a particular

population of site users. Information about teaching or learning level (elementary, secondary, post-secondary, by grade or by cycle) can determine whether the site is meeting needs or targeting the correct audience.

Conclusions

Success as a learning community?

The original question posed by this thesis was whether and to what degree the Québec English Schools Network web site and related services have succeeded in fostering an on-line learning community amongst educators in the province of Québec. We can infer from the body of literature relating to communities of practice that they contribute to positive change and are socially desirable. However, although their development can be supported and their growth nurtured, CoPs cannot be engineered. The evolution of a group of like-minded individuals with similar concerns and interests to a true community of practice is an organic one that occurs if the conditions are right and the environment is supportive. A CoP cannot be imposed.

In the case of the Québec English Schools Network, an attempt was made to create a central locus for sharing and discussion amongst practising teachers. Whether or not the original intent was to create a community of practice in the true sense of the word is immaterial in hindsight. However, some of the characteristics of a community of practice are clearly evident. For example, the listserv devoted to discussion of mathematics has been a meeting place for math teachers

from across Québec, even if it is not flooded with traffic. The kinds of conversations that take place would not have occurred before the QESN existed. The group mixes experts who have years of experience with novices who may never have taught math before. Given the fact that the site encompasses a wide variety of subject domains, it could even be said that the QESN is actually a group of communities of practice in varying stages of development.

The fact that use of the site has grown steadily and that the site itself has expanded immensely since its inception speaks to its success amongst users. However, when compared to some of the examples of CoPs in the literature on the subject, the QESN cannot be described as a highly active CoP. As a community of practice the QESN has not exhibited all of the stages defined by Gongla and Rizzuto (2001). By their definition, users of the QESN have probably not evolved past the Building Stage except in isolated instances. For better or for worse, the culture around the site appears to be more oriented towards consumption than sharing and collaborating. This *may* be due to a perception on the part of educators in Québec that they do not have enough time to engage in on-line dialogue and professional development activities with their colleagues. Another likely factor is that as a profession, teachers have never been encouraged on an ongoing basis to

share ideas and resources directly related to their classroom teaching. As a result, the culture of professional collegiality among teachers is poorly developed. Having had no opportunities outside of workshops and conventions to discuss issues with colleagues from other schools, teachers have no sense of the value of such exchanges. Even if professional interactions are something that they value, they may not perceive that there is a opportune outlet for those relationships. Related to this, it is possible that the QESN has not yet made a compelling enough case, or provided enough incentive for practitioners to share their professional resources and expertise.

Web-based resources that have similar goals to the QESN, such as TAPPED IN, The Inquiry Learning Forum and WINGS, devote considerable resources to providing a user-friendly environment in which educational professionals can discuss issues, ask each other questions or exchange ideas. These sites are generally well-funded through universities or governments and are able to hire professional programmers and designers to work on the technical aspects of the site, In the case of the QESN, the technical development, graphic design, and ongoing animation tasks are all performed by the same core individuals. As such, the degree to which the QESN team was able to foster an

environment conducive to communities of practice was somewhat limited.

Recommendations

Given the fact that the Québec English Schools Network Internet site has achieved a degree of success, it is important to try to achieve and maintain a momentum and to build on past success. However, in light of the factors noted above, a key recommendation for continued development and to improve the effectiveness of the site would be to engage in more proactive moderation of on-line communication. The QESN communities (assorted subject-related groups) have functioned as peer groups. On-line forums on the QESN have, with the exception of the MathChat group, which began with a period of fairly intense nurturing and moderation, not had any leadership to encourage and lead on-line discussions and exchanges.

Another recommendation would be that the coordinators of the site engage in reflective practice and evaluation of the site on a regular or ongoing basis. In order to remain true to its original objectives, the site (and its principal participants) should be regularly re-evaluated so that successful practices can be encouraged and less thriving activities modified or eliminated.

Espoused Theory vs. Theory-in-Use

The concept of reflective practice underlies both this study and the idea of communities of practice. Participating within a genuine community of practice, practitioners can not only benefit from dialogue with their peers, they can also reflect on their own process. The social aspect of functioning within a community can give individuals valuable external insight into their own ways of doing things. The difference between espoused theory and theory-in-use as described by Argyris and Schön may be easier to recognize with the benefit of some peripheral feedback.

There are a number of instances in the course of the study in which espoused theory clearly appeared to be at odds with theory-in-use. Respondents of the user survey stated quite clearly that they valued sharing of information and resources with other educators, yet in they practice they did not seem to follow through. The values of community were expressed in principle, but in practice they broke down to some degree.

People often enter into undertakings with the best of intentions and are unable for whatever reasons to follow through. When Math resources were first posted on the MAPCO website, the teaching community expressed a certain level of enthusiasm as well as a desire to not only

participate, but to contribute as well. However, the pattern of use as well as the development of the site has demonstrated that the QESN's audience in composed of a great many more consumers than producers.

At the outset, I stated my intention to examine my own espoused theory and compare it to my theory-in-use. In writing this discourse I have recognized some areas in which I deviated from the original path. For example, during the ScienceNet project in late 1995, I came to the attention of Laurent Trudel because of my ability to explain the Internet to novices. In addition, I was conscientious in following through on face-to-face meetings by sending out regular e-mail tips and soliciting feedback from the teachers. The original intention was for me to do the same thing on a much larger scale with mathematics teachers through the MAPCO site. However, I was not able to follow through with the same diligence. This may have been because the audience was much larger, I had not met any of them face-to-face, and my growing duties as a web developer/webmaster made it difficult to devote the time needed to animate discussions. Another issue that arose was the fact that as the teachers began to use the site more, the online discourse became more subject specific and it became harder for me, as a non-teacher and non-math specialist to animate discussions.

Another area of differentiation between what I believed should be done and what was actually done occurred in the whole approach to the development of the site. In this case, it provides a good example of the restrictions that real world situations impose on theory. In my own study of educational technology, I learned systematic approaches to the design of educational media. Those approaches included processes like needs assessment, learner analysis, and formative and summative evaluation. Whether for good or for bad, these processes were frequently shortcut in the name of expediency when the QESN was developed.

Some Final Thoughts on this Study

As a reflective exercise, this case study has revealed numerous things to me about my own role in the development the QESN web site. It has also helped me to better understand the evolution of the site and generated some ideas as to how to improve or nurture the community of practice.

The key limitations of my approach were due to a few key factors. Building a case study based on personal recollection entails certain risks in terms of validity and reliability. It is particularly important to find corroborating accounts from other sources in order to triangulate what actually occurred or what actual motives were. A compressed time frame limited the availability and accessibility of survey and interview subjects.

Also, the sample group in the on-line survey was skewed towards people who were actively using the site and even amongst those, it would tend to be the most active that would take the time to respond to a survey. Had I been able to select a more representative sample from the larger educational community, my results might have been somewhat different. Web server statistics provide quantitative data on web site usage, but fail to account for human factors, such as questions of whether content was read, understood or subsequently used in practice.

Still, this approach provided me with a valuable lesson in reflective practice. It has given me a wealth of new knowledge as well as tools that I can apply to my own work as a practitioner.

Endnotes

[1] Throughout this thesis the terms Quebec English Schools Network (QESN) and Québec English Schools Network RÉCIT (QESN RÉCIT) are used interchangeably. From 1996-2001 the QESN was coordinated by the Ministère de l'Éducation du Québec – Services à la communauté Anglophone – Direction des politiques et des projets (MEQ SCA-DPP). In 2001, the QESN became the official English sector component of a network called RÉCIT (Réseau de personnes ressources pour le développement des Compétences des élèves par l'Intégration des Technologies) and is now coordinated by the Central Quebec School Board rather than by the MEQ. The RÉCIT is a network of resource people for the development of student Competencies using Information and Communication Technology (ICT). Each individual subject domain (field of study) has a RÉCIT at the provincial level, and school boards have their own RÉCITs. Because of its size, the English sector's RÉCIT representation at the provincial level is provided by the QESN for all subject domains.

[2] In 1997, the CSCP became the Centre for the Study of Learning and Performance (CSLP).

[3] The first page of the web-based survey was a consent form (see Appendix B). Since it was not possible to obtain a signature on-line, respondents were clearly informed that their voluntary participation constituted consent. Only open-ended questions were optional, but respondents were free to discontinue their participation at any point in the survey.

[4] Responses do not total 81 because respondents were asked to select all of the locations from which they used the Internet.

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Appendix A – On-line Survey Results

1. Which of the following best describes who you are?	Response Total
Teacher	51
Student	2
Administrator	3
Parent	1
Consultant	12
Not in Education	1
Other Education-related field (please specify)	12
Total Respondents	82
(skipped this question)	0

2. Where do you usually access the Internet from? (check all that apply)	Response Total
Home	24
Office	42
School	0
Internet café	5
Library	1
Other	
Total Respondents	81
(skipped this question)	1

3. What speed is your connection to the Internet? If you access the Internet from more than one location please choose the the connection speed for the location you use most frequently.

	Response Total
14.4 modem or slower	3
28.8 / 33.6 modem	13
56K or ISDN modem	20
DSL or Cable	22
T1 or faster	12
Don't know	11
Total Respondents	81
(skipped this question)	1

4. What World Wide Web Browser do you use most of the time?

	Response Total
Netscape Navigator 4.x or higher	31
Internet Explorer 4.x or higher	46
Netscape 1, 2 or 3.x	1
Internet Explorer 1, 2 or 3.x	3
Other (please specify)	0
Total Respondents	81
(skipped this question)	1

5. What computer platform do you use most of the time?

	Response Total
Windows 95/98/2000/Me/NT/XP	69
Macintosh (System 7/8/9.x)	9
Macintosh OS X	2
Linux	1
Unix	0
Other (please specify)	0
Total Respondents	81
(skipped this question)	1

6. Which of the following plug-ins are installed on your browser? (check all that apply)

	Response Total
RealPlayer	59
QuickTime	56
PDFViewer (Acrobat)	76
Flash	45
Shockwave	43
Don't know	5
Total Respondents	80
(skipped this question)	2

7. Which of the following best describes your level of skill using the Internet?	
	Response Total
None	0
Beginner	1
Intermediate	55
Expert	24
Total Respondents	80
(skipped this question)	2

8. How often do you use the Internet?	
	Response Total
Daily	71
Several times per week	8
No more than once a week	1
A couple of times a month	0
Rarely	0
Total Respondents	80
(skipped this question)	2

9. For each Internet use below please check the box that best describe how you use the Internet.

	Never	Rarely	Sometimes	Regularly	Often	Response Total
E-mail			1	19	59	374
Newgroups	37	16	13	11	2	162
Chat	46	18	8	6	1	135
World Wide Web	1	0	1	24	52	360
Internet Phone	71	6	1	0	0	86
MP3 download	41	18	15	4	1	143
Streaming video/audio	25	20	24	10	0	177
Total Respondents	79					
(skipped this question)	3					

10. How did you learn about about the Québec English Schools Network RÉCIT website?

	Response Total
Colleague	25
Workshop	27
Newspaper/magazine/journal	0
Bookmark/poster	1
Internet Search	9
Other (please specify)	16
Total Respondents	78
(skipped this question)	4

11. Which of the following best describes how often you visit the site?

	Response Total
Never	0
Rarely (< 3 times in the past year)	7
Somewhat regularly (1 or 2 visits per month)	40
Regularly (1 or 2 visits per week)	17
Frequently (3 or more times per week)	14
Total Respondents	78
(skipped this question)	4

12. In each case below please choose the term that best describes how you use the QESN RÉCIT website

	Never	Rarely	Sometimes	Regularly	Often	Response Total
Read/download subject resources	6	10	26	27	7	247
Register for collaborative projects	47	10	9	7	2	132
Use sample exercises/activities	14	14	30	16	2	206
Find projects or lesson plans	16	13	29	12	6	207
Look up information about professional development grants and funding	29	13	23	8	3	171
Use special needs resources	36	19	14	5	2	146
Subscribe to mailing lists (listservs)	19	15	24	11	7	200
Contact Ministère de l'Éducation	51	11	9	3	1	117
Use sample exams	32	6	23	13	2	175
Obtain assistance with new programs	25	14	25	9	2	174
Download study guides	15	12	26	18	5	214
Use multimedia simulations (OhmZone / Powerhouse)	51	13	9	3	0	116
Use portfolio resources	38	11	20	6	1	149
Discuss common issues with colleagues	31	23	13	8	1	153
Contact RÉCIT animator(s)	54	9	9	2	2	117
Register for Linguistic Exchange program	72	1	3	0	0	83
Use French Second Language Resources	58	5	6	4	2	112
Look up information about upcoming events	11	13	30	21	1	216
Total Respondents	76					
(skipped this question)	6					

13. Please read each of the following statements about the QESN RÉCIT website carefully. For each statement below check the appropriate box to indicate to what degree you agree or disagree.

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	Response Total
Resources are useful and relevant to me.	23	43	4	2	0	129
Information is difficult to find.	2	16	15	32	7	242
There are too many choices. I don't know where to start.	5	4	20	32	11	256
Communicating with other professional educators via the website is important to me.	17	34	13	6	2	158
Using the website has improved my teaching.	11	28	26	5	2	175
It is easy to find what I am looking for on the site.	8	42	11	10	1	170
New material is posted on the site in a timely fashion.	10	35	21	5	1	168
The resources I have downloaded have helped me to improve student performance.	8	38	24	2	0	164
Collaborating with other teachers whether in my school or another is important to me.	26	30	13	2	1	138
Teachers should share their resources.	41	28	1	1	1	109
The website is irrelevant to my needs.	1	5	5	32	28	294
There are better resources to be found elsewhere on the Internet.	3	13	37	16	2	214
Total Respondents	72					
(skipped this question)	10					

14. What improvements would you like to see to Information and Content on the QESN RÉCIT website?

a) I feel uneasy answering the last questions about the specifics of the site because I have not been on the site in some time. I joined a listserv on inclusion and this has been my main contact with this site. The listserv seems to have fallen into disuse as I have not received any information for a long time such that I wondered if I was still subscribed!

b) In the reform link - what is new? The latest in cycle 3 and secondary implementation. A chance to share.

c) Topical resources at all grade levels, with opportunities for teahcers to shre material in many forms (e.g. word documents, pdf files, websites, powerpoint presentations, useful software). More opportunities for teachers (and perhaps students) to contribute. Lets see some sample course outlines here, and maybe more sample exams, and unit tests.

d) Prince Edward Island Education web site has an interesting section where the teacher has access to a template where s/he can plug in the provincial objectives and elements and then related lesson plans can be accessed or the teacher can put in a lesson idea, grade level etc and then the related objectives pop up. This type of thing done for the competencies, cross curricular and content would help teachers begin to plan lessons using the QEP.

e) More information on the Science portions of the Ministry Reforms so that we can start to prepare at the senior level

f) more links between subsites

g) A specific index of what is available. Surfing to see what is available is too slow and frustrating without the high speed internet.

h) None

i) even more resources.

j) more old exams and test questions, as well as activity exercises.

k) is it possible to have Phys Sci 416 sample exams posted for downloads as well as the 436 exams?? (the two courses are not the same and having

easy access to the old 416 exams would help my students prepare for the june summative exams)

l) Teachers do not have time to mess around with setting up plug-ins. We often have a limited amount of time to access resources by getting on whatever computer is available when we need it. Therefore, anything requiring plug-ins is a problem, because we don't have our own computers to set up (or the time to set up). Rather than getting fancy, get info on the net quickly, in html if possible, and pdf if necessary, so that it can be accessed and printed from almost any computer.

m) I would like to see the Help Centre featured more prominantly in the Connected ClassRoom section. Too far down on the page - rookies need to have quick and easy access.

n) It's much better than it was.

o) Since I am retired and do not have access to current style of provincial exams, I would like to see more current exams listed on the sites.

p) Perhaps some of the documents that are only available from the Ministry in French could be posted in English.

q) more single use resources

r) direct links to new materials

s) More on biology resources

t) Probably not enough teaching resources. Those that are available are good and relevant (I refer specifically to math).

u) That depends on the philosophy behind the building of the site. Being a science teacher, I would like to see a place where experiments,demonstrations, new computer software, and new lab equipment can be posted and shared

15. What changes would you make to the Organisation of the site?

1. I am not sure - the site is good and dynamic - probably publisize the site more. (have all school sites include this link in their web sites)
2. All of this government edu-speak takes too long to translate in usable guidelines (including the carrousel guidelines - "who came up with the brilliant idea of 'Itineraries' anyways").
3. Fewer clicks to reach desired info
4. A search function that is far more sensitive and robust.
5. None
6. have a menu for whole site on each page(ex.tabs at top of page) as in Apple site or TKI New Zealand site
7. More text based links on first page(perhaps in column formation) Changes made more often to the first page to highlight different things
8. None
9. o.k. as is
10. Navigation in Connected Classroom can be difficult if you don't know where to look.
11. none...i like it :)
12. At this point the splash page is getting busy...what about pop-up menus...?
13. Again, much improved over what it was.
14. That's a tough one. There is a lot of information available and it must be difficult to meet the needs of the variety of users accessing the site. Perhaps the site could be divided into professional areas, teachers, administrators, various consultants, parents, etc. Of course there would be a lot of overlap but it might make it easier for each "type" of user to find the information they are interested in.
15. It seems well organized.

16. Do you have any additional comments about the quality of resources on the site?

a) Quality is good. Probably more student oriented info and support.

b) Some of them are good, but it would be nice to have more of them.

c) no

d) very pertinent ; Quebec educators should use it more often to share resources

e) I "hit a brick wall" trying to find out about grants or any kind of Recit funding (other than PDIG grants which were pulled this year). Knowing who to contact at my board did not make getting information easier - Perhaps a more detailed listing of what the Recit does and can provide in the way of support and funding (if applicable - I'm told the recit does not provide funding).

f) Top notch!

g) good

h) None, no site can answer all needs.

17. If you have any additional comments or suggestions about the appearance of site, please write them below.

a) I'm sorry. I'm a new member and I don't know how to use your site yet.

b) none

c) site looks great!

d) some of my students have difficulty accessing the site at times...but most find that it is useful and enjoy the OhmZone/Powerhouse programs...

e) Smaller logo, bigger font on home page

f) It is getting more organized and easier to navigate/locate the resource you seek.

18. What new features would you like to see on the site?

a) Possibly links to school sites with "reformy" prokects or activities. Lead school links. More projects for secondary level - possibly multi-discipline to prepare for Sec. Reform Links to sites about intimidation, drugs & alcohol abuse, suicide prevention etc.

b) I would really like to be able to get more materials to supplement the textbook. We've been told at these workshops that the textbook is not the course outline, but for the english sector (since Caroussel has a monopoly) alternate materials require us to go looking to outdated texts (what, no colour pictures) or to other provinces or states.

c) Grant information Project learning tools

d) Continuing updates on the implementation of the Reforms

e) it was suggested to me that we have on-line workshops for teachers on the reform, similar to the Concept to Classroom PD on the WNET Thirteen site but that deal with the reform

f) more links in various subject areas with comments

g) ideas for class demos. for phys. sc., chem and physics.

h) The answers to the MEQ exams once the exams have been written.

i) The more teaching materials the better. It's a pity that more teachers aren't willing to put upo their own materials. On the other hand, the fact that the site is MEQ sponsored seems to mean that materials are strictly correct in terms of the official program guides. This is OK, but an intelligent teacher can use a variety of approaches and resources to attain course objectives.

j) See the first comment

Appendix B – Survey Consent Form

Welcome to the QESN RÉCIT website survey

This survey is intended to gather some basic information about your usage and impressions of the QESN RÉCIT website. Please take a few moments to answer the questions on the following pages. You are free to discontinue the survey at any time.

Note that proceeding indicates your consent to participate in the survey. You are not required to provide any personal information. The information collected here will be used for academic purposes only. Any personal information will not be associated with your responses. For more information about the survey, please contact Robert Costain.

Thank you in advance for your cooperation!

Appendix C – SSN/QESN Team Interviews

Sam Bruzzese

Sam Bruzzese is currently a principal in the Lester B. Pearson School Board. He helped to coordinate telecollaborative projects for the Small Schools Network.

1. What was your involvement (if any) in the original Small Schools' Network?

   I heard Christiane & Deborah speak at teacher's conference after the 1st year of operation --I liked what they said and I spoke to them right away & I started some projects --as well as getting my 10 elementary schools involved in some of the projects

2. In your view, what was the rationale for the development of the Small Schools Network?

   The goal was to link up the 400 or so English schools in Quebec -- especially the smaller off island school. The idea was to set up a community where people --would share ideas resources ,etc.

3. Where (or from whom) did the idea of a computer/ICT-based network come from?

   I think at the time -- in pre-interent days -- Schoolnet with gopher was interesting --we used ccmail

4. In a sentence or two, what is your evaluation of the success (or lack thereof) of the SSN/QESN during the time that you were involved in it?

   the original setup was very successful because of lack of resources on technology at the time --remember this was in telnet and gopher days --before the web became what it is

5. Has the QESN successfully created an online learning community of professionals (Community of Practice)?

   I think originally it is --however I feel that the WEB hit the Small Schools Network like a tidal wave -- and we were drowned by the influx of the web

   I don't feel the same connection now that it's web based -- a lot more cold and impersonal

6. What recommendations do you have for future development or to increase the success of the QESN RÉCIT?

   need to get back to roots --focus on very specific things --and try and set up a community of users --where everyone feels they know the others --less anonymity

Bob Colvil

Bob Colvil is a teacher at Knowlton Academy School in the Eastern Townships School board. He animated telecollaborative projects during the first years of the Small Schools Network and has continued to do so with the Québec English Schools Network.

1. What was your involvement (if any) in the original Small Schools' Network?

   Deborah was looking for teachers for the project. Ken France from the CEMIS at Waterloo asked me if I was interested for we had done some work together on computers in the classroom. I was the one large school 365 students the rest were from small schools outside the Montreal area. Each of us was asked to come up with email projects that could bring schools together. When we got together I basically took on the science area.

2. In your view, what was the rationale for the development of the Small Schools Network?

   The rationale was that there were many schools outside the large metropolitan areas that were isolated. This was due to the shrinking English population. By using computers we were to connect classes and teachers that usually were on their own.

3. Where (or from whom) did the idea of a computer/ICT-based network come from?

   Not sure, but Deborah had a definite idea of what she wanted it to do and that was to create projects that would bring students and teachers together.

4. What was the goal of the Small Schools Network?

   Again they realized with the shrinking English population that schools were shrinking not disappearing, but with these schools being small teachers didn't have anyone to talk to or bounce ideas off of. Therefore we were put together with the objective to experiment with Email and come up with ideas that could work.

5. How was the original SSN resource team recruited?

   Again Ken was the technical person with the small schools project and he knew I was interested in using computers in the classroom and asked if I was interested. Then he approached Deborah with

my name. As I said I didn't quite fit the model because of the sizze of my school, but i was out in the country.

6. What was the goal of the Québec English Schools Network at the time of its inception?

   My side was to create projects that would get students to use the technology and to take teachers into the computer world by offering them prepackaged projects with all the help they and their class needed to be sucessful.

7. In a sentence or two, what is your evaluation of the success (or lack thereof) of the SSN/QESN during the time that you were involved in it?

   The projects are first class and well thought out. We still haven't been able to get as many teachers involved as I had hoped. It seems teachers are still reluctant to get involved with the technology.

8. Has the QESN successfully created an online learning community of professionals (Community of Practice)?

   I feel the site is first class we just have to figure out away to get more teachers comfortable with the technology.

9. What recommendations do you have for future development or to increase the success of the QESN RÉCIT?

   A lot of our project are quite involved but take time. I think this scares off some teachers. Maybe we could start a quicky section that has projects that last only a week. This might get teachers started and willing to take on larger projects.

Christiane Dufour

Christiane Dufour has been a resource person with the Small Schools Network since its second year and was the creator of the Small Schools Network web site that quickly became the Québec English Schools Network.

1. What was the rationale for the development of the Small Schools Network?

   It was a response to the recommendations of the Chambers report that targeted the needs of Small isolated schools. In order to connect teachers, we felt it was best to try to connect classes through meaningful communications activities (now known as telecollaborations). In this setting teachers would exchange to plan and discuss the activities and exchanges, as well as exchange informally, created the basis of a small professional network. (1992)

2. Where (or from whom) did the idea of a computer/ICT-based network come from?

   The seeds were already in the Chambers report recommendations. The way to implement it (ie: connecting classes through activities as a way to connect teachers) came from the project co-ordinator, Deborah Gross.

3. What was the goal of the Small Schools Network?

   To link teachers and their classes, to help break the isolation of the teachers and their classrooms, and to contribute to creating a (vibrant) virtual community in the Québec English School

4. How was the original SSN resource team recruited?

   The original resource team consisted of 2 people: Deborah and... Paul Hazel was the first resource person, suggested by ? Christiane Dufour replaced him the next year. Recommended by Richard Bastien for whom I had worked in another capacity.

   We also worked in collab with Ken France of the Bedford Cemis who set up the cc-mail server we used. (was not officially a member of the resource team but a nice guy I need to mention!)

In 1993-94, Jan was recruited to support the Telescience distance education project because of her exceptional qualifications as a science teacher. .

Were also considered members of the resource team the teachers who implemented a telecollaboration with their class, 6 of which were given an "official" status and 20% release time to implement their project in 1995.

5. How was I recruited (trick question??)?

   Ask Deborah. But I think you were part of a good vintage year at Concordia.

6. What was the goal of the Québec English Schools Network at the time of its inception?

   Information, Communication, collaboration. (We love to work in threes)

   Information: delivery of resources and materials, more specifically to support the Mapco/Sapco initiatives

   Communication: extend the networking of teachers in contexts other than telecollaborations (again Math and science related)

   Collaboration: to extend collaboration among teachers, consultants, etc beyond the original framework of the SSN.

7. In a sentence or two, what is your evaluation of the success (or lack thereof) of the QESN in its 2 years?

   SSN: Exponential growth of participation (via cc mail) in its first 4 years (1992-1996): 7 - 15- 140 schools

   Not sure the year we mutated the name of the Small School Network to the SSN Project Center (essentially the year we put the SSN on the Web). The next year we became the QESN, and the Project Center became a subset of this.

   As for "success", if growth is a measure of success, then the QESN was successful.

   If success is measured by widespread use, then I would say we were not that successful. However, widespread use is dependant on many factors: access to technology and the usual patterns of

adoption of an innovation. We have not yet reached ... but might be reaching, ... critical mass.

If success is measured against goals, then it's more complicated.

Success in delivery of information for sure

Communication: on the way to success at different levels:
a- Networking teachers varies greatly ... some success
b- Networking organisations: we've put in place tools, we're a small group, we might make it!
c- Networking people within interest groups: the conditions are in place

Collaboration: goes hand in hand with communication

8. Has the QESN successfully created an online learning community of professionals?

The QESN was always at the head of the wave, riding it ... we have taken the initiative of direction and development.

The QESN has become a pole of attraction for "interest" groups (Mapco, Sapco, Kindergarten, French, IDC...etc.) who see it as a "place" and a "means" to pool their resources.

We may not be creating a learning community, but we are facilitating its emergence by supporting, hosting and being the publishing centre for local initiatives that can now have provincial impact and help promote a common vision in various fields of intervention.. ... by creating occasions, anticipating and supporting, and channelling initiatives in a direction that will move towards that goal,

9. What recommendations do you have for future development or to increase the success of the QESN RÉCIT.

    1. Make sure our guiding principles continue to guide us! (they are our "Program of programs")
    2. Technology watch: we need to have someone who is knowledgeable (expert or knows experts) in the latest technological solutions so that we can continue to do point 8a proficiently and seamlessly.
    3. Make sure our global and local goals are clear and evaluate our actions through that lens. (The QESN original goals are now blurred by the Ministry guidelines, which are not as broad.)
    4. Don't ask me to say practical stuff.... I always work from ideas and principals down!

Stephen Kohner

Stephen Kohner is a teacher at Baie Comeau High School in the Eastern Shores School board. He is currently a RÉCIT animator for his school board. He animated telecollaborative projects beginning in the second year of the Small Schools Network and has continued to work with the Québec English Schools Network.

1. What was your involvement (if any) in the original Small Schools, Network?

   I first joined SSN in 1994, at the beginning of its 2nd year of operation. I had 20% release time to animate cc:mail projects designed for upper elementary and lower secondary (BookRead; 2 Minute Mysteries). I also conducted a few in-service sessions for a few other school boards in our "area" (Gaspe and the Islands; Greater Seven Islands).

2. In your view, what was the rationale for the development of the Small Schools Network?

   a meachanism needed to bei n place to help small schools (anglo) communicate and collaborate with each other since we were extremely isolated form one another.

3. Where (or from whom) did the idea of a computer/ICT-based network come from?

   A couple of answers on this one. The MEQ DSEA (or whatever it was oringinally called), after the small schools conf in Qc in the fall of '92 saw the need to link schools and took advantage of available funding and human resources ot fulfill this need. It was alos some kind of serendipity going on there since many teachers were informally talking about this but had no idea how to put it all together.

4. What was the goal of the Small Schools Network?

   It was to link small rural anglo schools together via telecommunications in a spirit of pedagogical collaboration

5. How was the original SSN resource team recruited?

   If you mean the very original team - I think Deborah had put a call for teachers who showed leadership within theri classrooms, desire ot be involved in a provincial network and had some sort of computing experience.

6. What was the goal of the Québec English Schools Network at the time of its inception?

   to deliver web-based projects, pedagogical resources and serve to facilitate electronic communications between teachers.

7. In a sentence or two, what is your evaluation of the success (or lack thereof) of the SSN/QESN during the time that you were involved in it?

   It has profoundly changed my teaching in terms of pedagogical content, professional practices and commubnication amongst my peers. It gave me a long term focus (10 years now) and provided me with a model on how to successfully incorporate ICT into my curriculum, knowing I had the support of like-minded people.

8. Has the QESN successfully created an online learning community of professionals (Community of Practice)?

   The people I know who are involved in projects would certianly say yes. If you become involved, then you feel a part of this community. If you are simply sucking the resources from QESN without giving back (rciprocity) then I do not think you'd have the same feeling.

9. What recommendations do you have for future development or to increase the success of the QESN RÉCIT.

   We have to keep plugging away at what we do best - establishing personal contacts and involving them in projects one teacher at a time. We also need to have resources in order to be two years ahead of what is happening at the school level and that requires appropriate funding. I am impressed that even though QESN-RECIT is a huge operation, we've maintained this personal approach and touch to the teaching profession

Laurent Trudel

Laurent Trudel is a project officer for the Ministère de l'Éducation du Québec, SCA-DPP. He coordinates the activities of the Math Action Plan Committee (MAPCO) and the Science Action Plan Committee (SAPCO) and originally hired the author of this thesis to create a web site for math program implementation.

1. What was the rationale behind MAPCO's decision to develop a Computer-Based Support Plan?

   In preparing the implementation of the new math curriculum, MCC had been consulted and they wanted new types of support that would differ from the rabbit model (multiplicateur). We had many discussion at MCC and then at MAPCO to find ways to help teachers from remote areas and those in school boards where there was no math consultant implement the new 216 math curriculum This became a major focus as a follow-up to the June implementation session where teachers had expressed the need for on-going animation and support.

2. Did Gail Cornell's needs assessment address technology in any way?

   No except for Graphing calculators

3. What was the goal of the Computer-Based Support Plan and from where/whom did it originate?

   MAPCO members developed the idea through the many brain storms around support and on-going animation for remote areas.

   See answer 1

4. In your own words, what was the mission of the original Math web site?

   Address the need for on-going animation and support when implementing a new programm and allow teachers to network and exchange ideas and best practices, opinions, leads etc. See Appendix 10 of the Framework for the model then developed (class

to class / teachet teacher / teacher expert) That model was developed by MAPCO members with the help of Small Schools Network resource person and MCC members and MAPCO members.

5. What were the roles of our Math 216 "animators" (Liz Joyce, Bill Nevin, Sam Maclauclan, Neil Macintosh, Christine Deschenes)?

   Create a dynamic on the list serv to make sure teachers who had signed up would regularly receive messages in order to spark discussions and create a real and worthy (worthwhile?) people's network

6. In one sentence, your assessment of the success (or lack of) of the Math site in its first year on the web?

   A good start, slowly growing thank to the grass-root efforts and perseverance.

Bev White Weber

Bev White Weber was CEMIS (Centres d'Enrichissement de Micro-informatique Scolaire) animator and was involved in early projects that led to the development of the Small Schools Network. She is currently the coordinator of the QESN RÉCIT.

1. What was your involvement (if any) in the original Small Schools' Network?

   Part of the consultative committee to start the process initially begun by the DES' of ETSB – and EQRSB (now CQ). As a CEMIS supported Peter Simons – one of the 6 projects leaders

2. In your view, what was the rationale for the development of the Small Schools Network?

   How do we help diminish the isolation factor of our small schools?

3. Where (or from whom) did the idea of a computer/ICT-based network come from?

   We started with what we had – faxes and cc:mail which then became the provincial cc:mail network (GTTS did it see below) before we moved to Internet.

4. How was the original SSN resource team recruited?

   The small boards recommended their creative people.

5. What was the goal of the Québec English Schools Network at the time of its inception?

   To extend the philosophy of communication and community to all schools and teachers, which even though physically close, can be still isolated.

6. In a sentence or two, what is your evaluation of the success (or lack thereof) of the SSN/QESN during the time that you were involved in it?

   Had a dynamic influence on the use of ICT in the community and actually impacted on the greater francophone community who in 93-94 (GTTS – groupe de travail en télématique scolaire) had yet to understand the impact of the Internet.

   It was also the precursor to the concept of distance education with Telescience that has lead to DECN today – the distance Education Community Network offering in 2002-2003 Senior Math and Science courses as well has History 414 in a high tech audio-graphics environment www.horizonlive.com (some video expected next year).

   Once again our partnership sector is looking to our leadership in this dossier.

7. Has the QESN successfully created an online learning community of professionals (Community of Practice)?

   Yes and no – if one examines change theory we are doing extremely well!

Classification	% of total	% committed	Project
Innovators	3-4	3-4	SSN
Early adopters	13-14	16-18	QESN's birth
Early majority	33-34	49-52	Today and next year
Late majority	33-34	82-86	2-3 years from now?
Laggards	15-16	Will they?	

Design Tools for the Internet-Supported Classroom
Judi Harris
Association for Supervision and Curriculum Development
Alexandria, VA
ISBN 0-87120-294-8 (pbk)
1998

QESN is also a cross-curricular home – attempting to bring people together.

8. What recommendations do you have for future development or to increase the success of the QESN RÉCIT?

- To become the home for Quebec educators in the English Educator sector!
- To continue the symbiotic relationship with the task forces and develop and highlight exemplary pedagogical practice
- To find the appropriate use of technology for our system to better it (the system I mean)!
- On-line tools to foster practitioners' professional skills
- Always questioning.

Appendix D – Samples of ScienceNet Internet Tips

November 1995

INTERNET BROWSER TIPS #1: USING NETSCAPE NAVIGATOR

The View Bookmarks screen features a 'Copy Bookmark' function. While on first glance this may appear to add to confusion rather than help, it can actually be quite useful, especially when several users access the same copy of Netscape.

SET UP INDIVIDUAL BOOKMARK headings for each user. Each user can then put their own bookmarks in their own submenu. By copying the bookmarks, different users can have access to the same bookmarks through their own submenu.

E.g. Mary & Sam have been 'Net surfing and have collected about eighty bookmarks between them in no particular order. Mary is primarily interested in biological science sites while Sam is more interested in art education. However, they are both interested in any sites which deal with Windows software. THE SOLUTION: Set up two subheadings: Mary & Sam. Move all the biology bookmarks under Mary's heading and all the art bookmarks under Sam's. However, copy all the Windows-related bookmarks and place one copy of each under each person's heading.

REDUCE CLUTTER by eliminating bookmarks that you haven't accessed in a long time. The View Bookmarks screen will tell you when someone last accessed each bookmark. You must have 'More Options...' for this information to appear. Select a bookmark and the creation and last access date will appear on the right half of the screen for that bookmark.

COMMENTS?

Did you find these tips helpful? Let me know. If there are any specific topics you would like covered, please send me a message.

November 1995

INTERNET MAIL TIPS #1: USING EUDORA

Note: This is a fairly long message. I suggest you print it out.

QUOTING MESSAGES

When replying to Internet messages, it is often helpful to quote part of the message you are replying to. This helps the recipient of your message remember what you are referring to. It is also a good tool when group work or discussion is taking place via e-mail, as you can place your reply in the context of the overall discussion taking place.

Eudora facilitates this process by quoting the entire message in the reply. While this is handy when the messages are short, it can be a real pain when quoting longer messages or when replying to people with long signatures.

A way to improve on this handy feature of Eudora is to select the text you would like to quote, and hold down the Shift key while selecting 'Reply to All' from the Message menu. Instead of copying the whole message to your reply, Eudora only copies the text you selected.

If you are using Eudora on the Mac, you can find more handy shortcuts by pulling down the Balloon help (?) menu on the right side of the menu bar at the top of the screen and selecting 'Modifiers & Keys.'

BTW, the latest version of Eudora is 1.5.3, a.k.a. Eudora Light. It is available by anonymous FTP from ftp.qualcomm.com. I can also send it as an attachment to any Mac user who requests it.

MULTIPLE MAILBOXES

When multiple users receive mail at the same account, you can use Eudora to set up individual mailboxes. Whoever takes responsibility for checking the mail each day can then transfer each users mail from the 'In' box to their own space. This adds an element of privacy to a group work situation and decreases the clutter in the 'In' box.

TO CREATE INDIVIDUAL MAILBOXES, select 'New...' from the Transfer menu. Type in a user's first name and check the box which says 'don't transfer, just create mailbox.' Click 'OK.' Repeat the process for each user.

TO TRANSFER MAIL from the 'In' box to a user's mailbox, select the mail message (just click once, don't double-click!) and select the person's name from the Transfer message. The message you selected will be moved to the person's mailbox.

TO ACCESS MAILBOXES, select your name from the Mailbox menu. A window will open listing the messages in your mailbox. You can now read and/or delete your own messages.

NOTE: For messages directed at multiple users, consider leaving them in the 'In' box until everyone has had a chance to read them, or create a 'Group' mailbox.

COMMENTS?

Did you find these tips helpful? Let me know. If there are any specific topics you would like covered, please send me a message.

November 1995

INTERNET MAIL TIPS #2: USING EUDORA

MORE ON QUOTING MESSAGES

Versions of Eudora later than 1.4.4 for both the Mac and PC support a feature called 'Paste as Quotation'. This is a handy feature when working in a group situation, and you want to address several messages at once, or forward information.

The feature is very simple to use. Open the message you wish to reply to and highlight the text you want to quote. Select 'Copy' from the Edit menu.

Open the message you are composing and click the cursor where you want to place the quote. Select 'Paste as Quotation' from the Edit menu. The text will be pasted in with a '>' at the front of each line. This is the standard convention for quoting.

Since you can have multiple message windows open at once, you can copy and paste like this among multiple messages:

On Tuesday, Bob wrote:
>Blah Blah Blah Blah Blah Blah Blah Blah Blah Blah Blah Blah Blah Blah Blah Blah Blah
>Blah Blah Blah Blah Blah Blah.

On Wednesday, Carol wrote:
>Yady Yady Yady Yady Yady Yady Yady Yady Yady Yady Yady Yady Yady Yady Yady Yady Yady Yady Yady Yady Yady.

COMMENTS?

Did you find these tips helpful? Let me know. If there are any specific topics you would like covered, please send me a message.

Appendix E – Example from the MathChat Mailing List

August 2000

(O.N. was one of the original moderators of the MathChat list when it was first established)

Dear all,
Some questions that were burning me all summer: What can we, older, more experienced math teachers do to help new math teachers in their first year(s) of teaching. What are our expectations of them? What are their expectations of us, and of teaching? Is anything being done at teachers' colleges (or at schools) to inform new teachers on how best to fit into the team (if one exists) in the math department?
Sincerely
O.N.

Dear O.,
As a first year math teacher (at the age of 52), I would love to begin this discussion. It would be so helpful for me to get advice from you veterans, tips on ways to "hook" the kids, great books, websites and other resources, professional organizations/journals that you would suggest, etc. I am teaching 8th grade math: 2 Algebra classes and 3 Connected Math Project classes. This is the first year of CMP in the school system. From my very brief orientation, it seems to be a good exploratory program. Would be curious to hear from others who might be familiar with it. My background is 25 years in corporate America...a Customer Service Manager and Marketing Research Manager at XXXXXXXXX. I love teaching and am really looking forward to this 2nd career. I am especially interested in working with kids who are really having difficulties with math and would like to prepare myself better to do this. Any thoughts on courses I should take, books to read, etc. Also, interested in the topic of Girls and Math and what I can do to help reduce the gaps, etc. In other words, I would love to just talk! Hope someone else out there would love to share.
Thanks,
B.Q.

Hello all!
While there are many valuable ways to help young teachers, I think it is fundamental that we enable them to grow professonally on their own. One of the very first things they should do is become a member of the National Council of Teachers of Mathematics (NCTM) and subscribe to one of their journals. They should also join the Quebec Association of Mathematics Teachers (QAMT). One of the goals of the more experienced teachers should be to help the development of the young teachers towards becoming our future leaders. Needless to say, we should lead by example and make sure that we are members of NCTM and QAMT. If we

consider ourselves professionals, we should be spending at least $150 per year on ourselves as math teachers. For this amount, a teacher could join both NCTM and QAMT and purchase a professional book for himself/herself. Enough for now! I'll step down from my soapbox.
Regards,
N.B.

Dear N.B.,
Good idea. Is there an NCTM or QAMT address, email and or website people can call on?
O.N.

Greetings -
In response to O.N.'s question, I agree with N.B. that new secondary school mathematics teachers should join NCTM and QAMT and consider buying themselves a good professional book. However, they should also consider buying themselves a good thriller or biography or romance or whatever else they enjoy.
Keeping yourself WHOLE as a person will invariably make you a better teacher - this applies to both beginners and seasoned veterans. Surely new teachers can benefit from the advice of veterans regarding their lessons, tests, and classroom management, but they can benefit in other ways, too.
Perhaps one of the ways you can help new teachers get off to a good start is to make certain they come up for air! Call them away from their preparation work once in a while to come have coffee and discuss their work. Offer advice and ideas, and consider seeking their advice too. Encourage them to try some of the ivory-tower pedagogy that they have just learned - who knows, some of those textbooky ideas might actually work.
The teaching profession probably has the worst possible approach to the induction of new members of the profession. Generally, new teachers are given a full load, the most awkward schedule and the classes that no one else wants. The experienced teachers on a school staff can do a lot to help the neophyte through those first few years.
I.S.

Hello,
This will sound like preaching to the converted but inviting new teachers to join the community of "connected educators" might be a good hint.
They will not be reading this e-mail but thanks to your advice, they might read future listserv messages. Like many of us, I have a lot of pleasure reading the messages that are sent to the list serv Mathchat .
The advice to give to new teachers?:
"Join Math chat!"
"Now how do I do that?"
"To subscribe, send a message to listserv@qesn.meq.gouv.qc.ca. In the body of the message type: Subscribe MathChat [your name]."

Also, you could recommend to new teachers that they send a request to the Mathematics Action Plan Committee (MAPCO) asking to be put on the mailing list of the Mathematalk Newsletter. They can do that by calling Marie at 514-XXX-XXXX, faxing her the information at 514-XXX-XXXX or by e-mail: marie.marieval@meq.gouv.qc.ca.
While they are at it, new teachers should ask Marie for a copy of the Mathematics and Science resource Toolkit CD that has been developed recently?
Finally, you could suggest a visit to the Quebec English Schools Network (QESN) at the following:
http://www.qesn.meq.gouv.qc.ca/mapco/index.htm
One of the advantages of joining the mathematics community through QAMT, MAPCO listserv and Newsletter and NCTM, is that the new teacher is informed of professional development opportunities he or she can then choose from.
Have a nice school year everyone !
J.F.

Dear I.S.
Thanks for your input.
Does McGill offer any courses to its student teachers to prepare them for working in a new school on a "team". As you wrote, teachers usually are just thrown into the class with the sink or swim mentality. They are not always aware that they can ask for help or aware of the rules that exist in a school that they are expected to "know" - the old-oral-tradition-that-no-one- ever- talks- about- and -you- only-find- out- once- you- screw- up scenario. Or teachers get into the my-classroom-my- castle- no- trespassing mentality wherein they hide their mistakes and are not open to advice from others and the students suffer. Or they might already know it all.
I think there is a role here for the teacher colleges. I have attended some doozie courses - isms and wasms, using the photocopier, etc....why not on professionalism - although I agree in advance that it is a hard thing to teach. What do you think??
Cheers
O.N.

A further response to O.N. on the education of teachers:
You raise an interesting question about the education of teachers. I'm not certain that some of the concerns to which you alluded can or should be addressed by university courses, and let me offer some reasons why I think this way:
1. The education of teachers does not relate only to courses and credits in their university studies leading to certification. Much of it resides elsewhere.
2. Some aspects of the induction of new teachers into the profession are controlled by the profession and its collective agreement, and by employers. Perhaps new teachers should have a significantly reduced workload, but be working full time at a reduced salary and be under the guidance of a "veteran teacher" (I hesitate to use the terms "master teacher"). However, would the teachers' collective agreement permit that? If school boards (and the teachers' unions, and the society at

large) could accept the idea that the first year or two of a teacher's work tend to determine the kind of teacher they will become, perhaps they would be willing to make a greater investment in those initial years.
3. Some of the learning necessary - such as how to work as a member of a team, how to judge who to approach when you need advice - seems to be in the category of common sense. In my experience you can't teach people common sense. Those who have it are insulted by your attempts. Those who don't have common sense don't even know what you're talking about.
4. Most of us here on McTavish Street do include some aspects of professionalism, ethics, and behavioral standards, into our courses that are tied closely to the student teaching experiences. Our students (both elementary and secondary) have four student teaching experiences - two somewhat light ones and two major ones. It is in those student teaching experiences that students get to observe the professional behavior of real working teachers, and, I suppose; begin to emulate what they observe.
I don't want to make this into a debate as who must accept responsibility for helping young teachers develop a healthy outlook on their chosen profession, but the cliché fits: the ball is in your court I hope you all help the school year get off to a good start for yourselves and your students.
I.S.

Dear I.S.
Thank you for the candid and well thought out responses.
O.N.

Dear MathChat subscribers,
Further to helping new teachers:
The current (Sept., 2000) issue of NCTM's The Mathematics Teacher in its regular column of "Classy Tips" offers 3 pages of advice from 9 different teachers to beginning teachers! I'm not sure if the publication is available from the NCTM web site but if anybody wants a copy, let me know and I will fax the pages to you.
N.B.

Hello, all!
Will share this with my co-workers. Thank you very much.
S.M.